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INTERNATIONAL HELLENIC UNIVERSITY

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF BIOMEDICAL SCIENCES

STUDY GUIDE

DEPARTMENT OF BIOMEDICAL SCIENCES

«THESSALONIKI», 2023

EDITING GROUP

Eleftheriou Phaedra

Giannakou Ourania

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FOREWORD (<Welcome Note from the Head of the Department >)

Dear students,

Welcome to the Department of Biomedical Sciences of the School of Health Sciences of the International Hellenic University.

The aim of the Department of Biomedical Sciences is to offer a four-year University Studies leading to a Bachelor's Degree in Biomedical Sciences of University Level (Bachelor's Degree - level 6 according to EQF, European Qualifications Framework, Bologna) in accordance with corresponding Biomedical Sciences Departments abroad.

The study program of the department is completed in 8 semesters and includes 5 months of compulsory internship in the last semester and 2 months of optional internship during the studies (after the 6th semester). It also includes an optional thesis.

The Biomedical Sciences degree provides students with academic knowledge and skills to perform laboratory methods in diagnostic laboratories for the purpose of diagnosing diseases. As in other countries abroad, students are trained to work in institutions providing services related to their field of study, both in the public and private sectors in laboratories, pharmaceutical industry, research facilities and in education (secondary and tertiary).

The Biomedical Sciences department of IHU has an ongoing interest in multinational cooperation both for student and academics participating in different Erasmus and other international Programs.

At the same time, the Department aims to train students in research way of thinking and practice so that they can be employed in postgraduate and doctoral studies and staff research laboratories after graduation.

The Department has established professional rights (opportunities) as from December 2022 (Law 4999, Official Gazette 225/7-12-2022, article 32). Furthermore, according to Presidential Decree 85/2022 on the determination of qualifications for appointment to public institutions (Qualification List - Classification), graduates of the Biomedical Sciences degree program, are included in the Specialty 3 of Medical Laboratories, Branch 3 of the Biomedical Sciences of Health Sector of University Level Education Category (PE).

Finally, the Department of Biomedical Sciences offers four Postgraduate Programs of Studies, three in Greek and one in English, as well as the possibility of completing a doctoral thesis.

The Head of the Department

Maria Chatzidimitriou, MD, Phd
Medical Biopathologist
Professor of Microbiology and Immunology

1. THE INTERNATIONAL HELLENIC UNIVERSITY

General Information

The International Hellenic University (IHU),based in Thessaloniki, was founded in 2005 (Law 3391/2005, Government Gazette 240/A΄/2005)and is organized and operates as a HigherEducational Institute (HEI) in the university sector, in accordance with Law4485/2017 (GovernmentGazette114/A΄/2017).WithLaw4610/2019 (Government Gazette 70/A΄/7-5-2019), seven (7) Schools were established therein with corresponding Departments in each of them.

Additionally, inside the IHU, there is a University Center for International Studies, also based in Thessaloniki,which operates as an academic unit of the institution.The following Departments are established at the University Center for International Studies:
a) Humanities, Social and Economic Sciences, which is part of the School of Humanities, Social and Economic Sciences.
b) Science and Technology, which is part ofthe Schoolof Science and Technology

The aforementioned Departments are located in various cities of Northern Greece. Most of them are mainly concentrated in four campuses: Thermi (where the University headquarters are also located),Sindos, Serres and Kavala.

Academic and Organizational Structure

According to the current legislation, the University is subdivided into Schools, which cover a set of related scientific disciplines, so that the necessary coordination for the quality of the education provided can be ensured. A School is subdivided into individual Departments which also constitute the basic academic units. The units in question cover the subject of a specific scientific field and award the corresponding degree/diploma. The Schools of the International Hellenic University - with their Departments - are as follows:

SCHOOLS	DEPARTMENTS
SCHOOL OF ECONOMICS AND BUSINESS ADMINISTRATION (Thessaloniki)	• Department of Business Administration (Serres) • Department of Economic Sciences (Serres) • Department of Supply Chain Management (Katerini) • Department of Accounting and Finance (Kavala) • Department of Business Administration, Marketing and Tourism (Thessaloniki) • Department of Accounting and Information Systems (Thessaloniki) • Department of Management Science and Technology (Kavala)
SCHOOL OF SOCIAL SCIENCES (Thessaloniki)	• Department of Library, Archive and Information Science (Thessaloniki) • Department of Early Childhood Education and Care (Thessaloniki)
SCHOOL OF HEALTH SCIENCES (Thessaloniki)	• Department of Biomedical Sciences (Thessaloniki) • Department of Nutritional Sciences and Dietetics (Thessaloniki)

	• Department of Midwifery Science (Thessaloniki) • Department of Physiotherapy (Thessaloniki) • Department of Nursing (Thessaloniki) • Department of Nursing (Didymoteicho Branch)
SCHOOL OF ENGINEERING (Serres)	• Department of Industrial Engineering and Management (Thessaloniki) • Department of Environmental Engineering (Thessaloniki) • Department of Information Technology and Electronic Engineering (Thessaloniki) • Department of Computer, Informatics and Telecommunications Engineering (Serres) • Department of Surveying and Geoinformatics Engineering (Serres) • Department of Mechanical Engineering (Serres) • Department of Civil Engineering (Serres)
SCHOOL OF DESIGN SCIENCES (Serres)	• Department of Creative Design and Clothing (Kilkis) • Department of Interior Architecture (Serres)
SCHOOL OF SCIENCES (Kavala)	• Department of Computer Science (Kavala) • Department of Physics (Kavala) • Department of Chemistry (Kavala)
SCHOOL OF GEOSCIENCES (Drama)	• Department of Agricultural Biotechnology and Oenology (Drama) • Department of Agriculture (Thessaloniki) • Department of Forestry & Natural Environment (Drama) • Department of Food Science and Technology (Thessaloniki)
SCHOOL OF HUMANITIES SOCIAL SCIENCES AND ECONOMIC STUDIES (Thessaloniki)	• Department of Humanities Social Sciences and Economic Studies (Thessaloniki)
SCHOOL OF SCIENCE AND TECHNOLOGY (Thessaloniki)	• Department of Science and Technology (Thessaloniki)

The administrative bodies of each School are the Deanery and the Dean.

The Deanery of each School consists of:

-the Dean,

- the Presidents of the Departments, and

- representatives of Special Technical Laboratory Staff (E.TE.P.), Special Teaching Laboratory Staff (E.D.I.P.), and students.

The Department is managed by:
- the Department's Assembly
- the Management Board, and
- the President of the Department

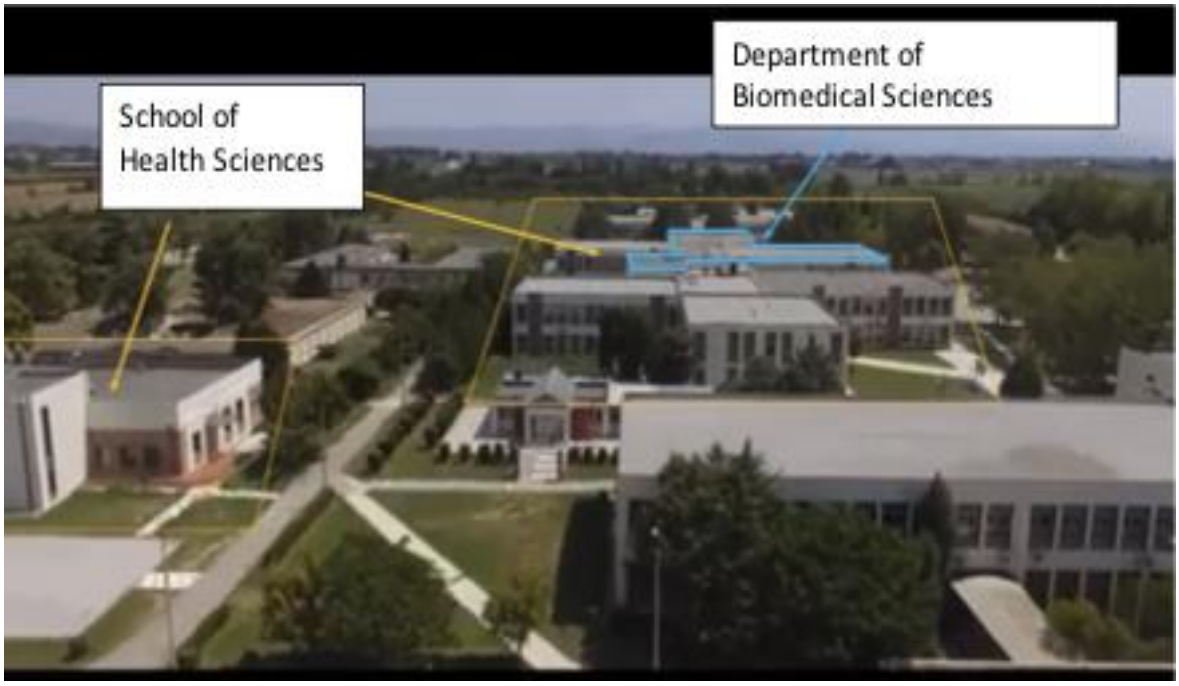
The Assembly of the Department is made up of the Educational Staff members of the Department ,the technical staff representatives, undergraduate and postgraduate students.
The Assembly and the President of the Department consist the Bodies of the Departments' (established) directions (Sectors) - where they exist. The Assembly is made up of the Educational Staff members of each course and of student representatives.

The Campus (of the city where the Department is located)

The Alexandrian Campus is located in the municipality of Delta (Sindos area, to the west of the Municipality of Thessaloniki) and hosts a total of 14 of the 32 Departments of Undergraduate Studies of the International University of Greece (DI.PA.E.) which are distributed over 7 Schools and 7 Campuses and spread over 6 cities of Northern Greece (Thessaloniki, Serres, Kavala, Drama, Kilkis, Katerini). https://www.ihu.gr/about

The Alexandrian Campus (https://youtu.be/nYBjex60_aY), together with the Thermi Campus, that hosts the University Administration and the University Center for International Study Programs, constitute the two University Campuses of the Prefecture of Thessaloniki.

The Department of Biomedical Sciences belongs to the School of Health Sciences together with the Departments of Nutritional Sciences & Dietetics, Midwifery Science, Nursing, Physiotherapy which are also located on the Alexandrian Campus.



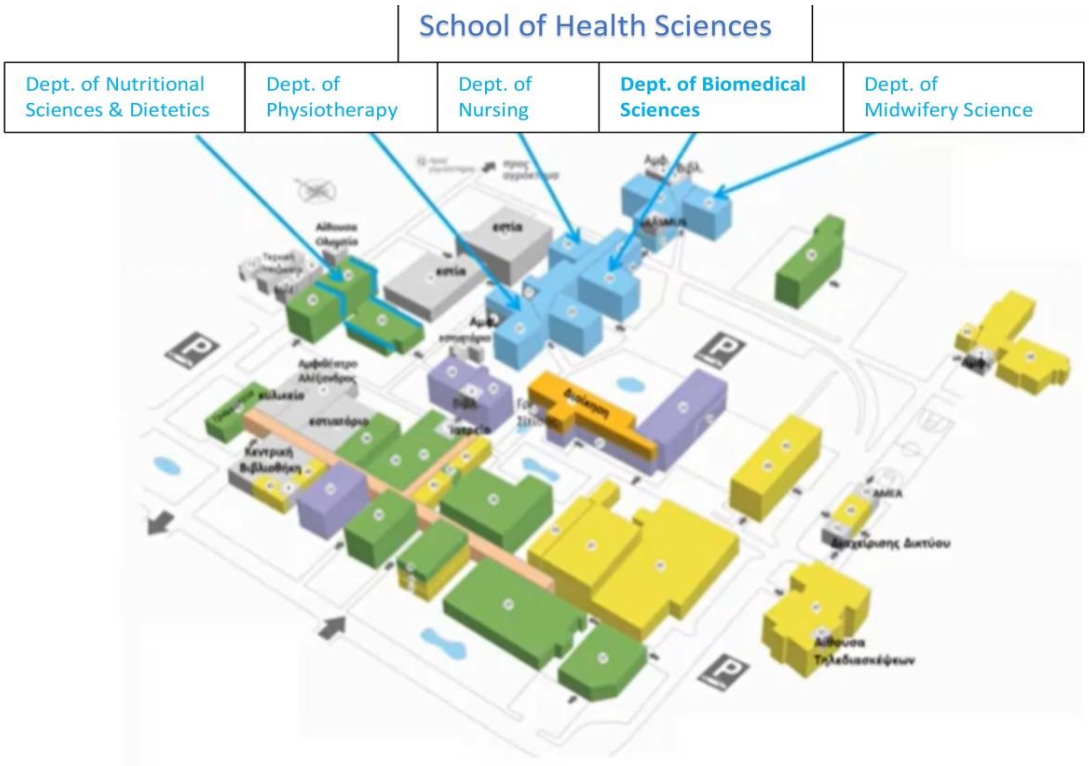


Figure 1. Departments of School of Health Sciences – Alexandrian Campus.

2. THE CITY of THESSALONIKI

Geographical and Demographic Information

The Prefecture of Thessaloniki is located in central Macedonia, it stretches from the Thermaikos Gulf in the southwest, to the Strymonikos Gulf in the east. In the central-northern part of the prefecture extends the valley of Mygdonia with lake Koroneia and a little further east lake Volvi is found, while it is crossed to the west by the rivers Echedoros (Gallikos) and Axios which flow into the Gulf of Thermaikos, with the Axios estuary to form the Axios delta, a world important ecosystem. Mountainous areas include the Chortiatis in the west-central part, the Vertiskos in the north and parts of the Kerdylio mountains in the northeast.

The Regional Unit of Thessaloniki has approximately 1,100,000 inhabitants and is divided into 14 municipalities. Among them, the municipality of Thessaloniki is the main municipality of the city and the capital of the Prefecture. The municipality of Thermi, which houses the administrative headquarters of I.H.U. is located in the south-east of the municipality of Thessaloniki, while the municipality of Delta with its headquarters in Sindos, which hosts the Alexandrian Campus of I.H.U. is located in the west.

Historical data

The city of Thessaloniki is built on the Thermaikos bay with a layout that follows the coast and extends on the hill forming the Ano Polis.

In the area where the city is now located, many settlements were developed dating as far back as the Neolithic and Bronze Age. Settlements from the Iron Age and later times (9th-4th century BC) have also been found. These settlements formed the 26 settlements, the union of which created the city.

Thessaloniki was founded by Kassandros, general of Philippos II, in 316 BC and named after his wife and sister of Alexander the Great, Thessaloniki. The new city was created on the site of ancient Thermi by the merger of neighbouring settlements and experienced significant growth, initially because of its strategic position for the Macedonian state.

During Hellenistic times (336 - 30 BC), the city followed the administrative model of other Greek cities. It was a major commercial centre and was fortified with walls from the 2nd century BC.

The walls of the city began to be built by the King of Macedonia, Kassandros, after the foundation of the city in 315 BC, were reinforced by the Romans and were given their final form in the 4th century AD by the Emperor Theodosius, although they were completed and repaired many times afterwards. The walls were trapezoidal in shape, based on the sea wall, with two vertical arms, east and west, ending in a triangular acropolis. Although large sections have been demolished from time to time in order the city to be expanded, part of the walls and some of their fortifications survive and dominate mainly in the Upper City. The fortifications of the city include the White Tower, which was built much later, during the Ottoman Empire, on the city's coastal front.

From 168 BC, the city passed under the Roman rule, becoming the capital of the Roman province of Macedonia from 148 BC. As part of the Roman and later the Byzantine Empire, it has a strategic role and is often in a privileged position. In 44 AD it was declared a "Free

City". Most of the Roman monuments that survive in the city were built in the 2nd and 3rd centuries AD, such as the Roman Forum (3rd century), above Aristotelous Square, between Olympus and Filippou Streets and the complex of the Rotonda, the Hippodrome, the Triumphal Arch or the Galerius Arch (Kamara). In 324 AD Constantine the Great constructed an artificial harbour and made Thessaloniki the "Regent" of the Empire with Constantinople as its protectorate.

The turbulent history of the city includes rebellions, such as that against the Emperor Theodosius I the Great, Slavic and Bulgarian invasions in the 9th and 10th centuries AD, occupation and extensive destruction by the Normans and then occupation by the Franks. In 1224 it was liberated by the Greek ruler of Epirus, Theodoros Doukas Komninos, and became the capital of the Despotate for 22 years until its reintegration into the Byzantine Empire, which was reconstituted after the Fourth Crusade. In the 14th century, after the Zealot movement, it became an independent republic. But it was conquered by the Turks and then by the Venetians, to end up under Turkish rule from 1430 AD for 482 years. Towards the end of Ottoman rule, the city and the surrounding area was claimed by Greeks and Bulgarians (Macedonian Struggle), until October 26, 1912 AD, when it was liberated by the Greek army, a protocol of surrender of the city was signed and the modern history of the city began.

An event that severely traumatized the City during its later history was the devastating fire in 1917, which wiped out the entire city centre, leaving 73,000 inhabitants homeless, having lost their homes, shops and property. After the fire, the historic city centre was redesigned on Prime Minister Venizelos' orders by the French architect, urban planner and archaeologist Ernest Hebrard, who tried to give the city a modern character with Byzantine elements, columns and arches. The designs were spread throughout the centre, but a small part of them was applied to the buildings that line today's Aristotelous Square and Eleftherias Square.

October 3, 1926 was the day the first-ever Thessaloniki International Fair (TIF) took place in an area provided by the army. TIF, from the 1930s to modern day, was to take place in the center of the city.

After its liberation (1912), refugees from various regions and from the Greeks of the East began to flock to the city, culminating in 1922, when thousands of refugees from Asia Minor flocked to the city with the signing of the Treaty of Lausanne and the decision to exchange populations. At the same time, Ottoman Turks left the city. The city gradually becomes a mosaic of Greeks who have come from various regions of the former Ottoman Empire, Asia Minor, Pontic and Thracians who initially live in difficult conditions but gradually create settlements expanding the city.

In 1941, during the German occupation, thousands of Thessaloniki's Jews are transported by train to the Nazi camps and the Jewish community of the city is almost wiped out, while many Jews and Christians are killed in the city itself.

The Thessalonians gradually embraced Christianity from 50 AD when the Apostle Paul preached in the city. In the 3rd century A.D., a time of Christian persecutions, St. Demetrius, a Christian and an officer in the Roman army, member of a prominent noble family of the city, was a Greek Christian martyr. St. Demetrius the Myroblyte is an important symbol of the Christians of the City and is the Patron Saint of Thessaloniki, celebrated on October 26.

The church of Agios Dimitrios, built on the site of his imprisonment and martyrdom, is an important pilgrimage site in the city center.

Thessaloniki is also the birthplace of Saints Kyrillos and Methodios, who spread Christianity to the Slavs and are considered the inventors of the first Slavic alphabet.

The Thessalonians maintained their faith during the Ottoman occupation, as the post-Byzantine churches that have survived in the city demonstrate.

Useful links of transportation

Thessaloniki map:
https://www.google.com/maps/place/Thessaloniki/@40.6211925,22.9511008,13z/data=!3m1!4b1!4m6!3m5!1s0x14a838fd5a9e1559:0x1e6cde1ac7591bd9!8m2!3d40.6267418!4d22.9594983!16s%2Fg%2F119vlz9_l

Thessaloniki Monuments map:
https://thessaloniki.gr/wp-content/uploads/2019/11/Thessaloniki-Monuments-Map-ENG-Web.pdf

Public transport:
Oasth (public transportation): https://moovitapp.com/index/en/public_transit-lines-Thessaloniki_Θεσσαλονικη-2860-852864

Line 52 bus: https://moovitapp.com/index/en/public_transit-line-52-Thessaloniki_Θεσσαλονικη-2860-852864-676336-0

Thessaloniki airport - Makedonia :
https://www.skg-airport.gr/en
Thessaloniki airport location

3. THE DEPARTMENT OF BIOMEDICAL SCIENCES

The Department of Biomedical Sciences, School of Health Sciences of the International University of Greece was established in May 2019 by Law 4610 (Government Gazette 90/Α΄/07-05-2019) “Synergies of Universities and T.E .I., access to higher education, experimental schools, General Archives of the State and other provisions".
In 2019 the Technological and Educational Institute of Thessaloniki (T.E.I.Th.) became part of the International Hellenic University (I.H.U.) and the Dept. of Biomedical Sciences merged with the former Department of Medical Laboratories of T.E.I.Th, (founded in 1973).
Renaming was deemed necessary to better harmonize the Department’s name with the BIOMEDICAL SCIENCES departments of European Universities, providing graduates with corresponding knowledge, skills and possibilities for carreer opportunities.

The scientific field of the Department of Biomedical Sciences is included in field 09 - Health and welfare - based on the International Standard Classification of Education of UNESCO (ISCED 2013).

The mission (aim) of the Department of Biomedical Sciences is the development of Education and Research in Biomedical Sciences, the creation of partnerships with social institutions and stakeholders in the field of Biomedical Sciences and the transmission of knowledge and know-how, providing all levels of education level 6, 7 and 8 according to Bologna Process.

The Department of Biomedical Sciences:

a) Offers an undergraduate degree in Biomedical Sciences (8 semesters)
b) Provides a "Master's Program in Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases", in co-organization with the Department of Medicine of the Democritus University of Thrace, and
c) two Master programs in in co-organization with the Department of Medicine of Aristotle University, entitled:
    - Vaccines and Infectious Diseases
    - Applied Gerontology and Geriatrics
d) Provides a Doctoral Studies Program
e) Carries out research in areas related to Biomedical Sciences and in scientific gields according to the research interests of faculty members.
f) Furthermore, it seeks to carry out research in active collaboration with social institutions.

Figure 2. View of the Department's building - BIOMEDICAL SCIENCES -

4. THE UNDERGRADUATE STUDY PROGRAM

The aims of the Undergraduate Study Program

The Biomedical Sciences Department's Undergraduate Study Program (U.S.P.) aims to offer a four-year University Studies leading to a University Level Biomedical Sciences degree (Bachelor's Degree - level 6 according to EQF, European Qualifications Framework, Bologna) in analogy with corresponding Biomedical Sciences Departments abroad.

The goal of the Biomedical Sciences Undergraduate Study Program is aligned with the Policy for the Education of Biomedical Scientists (EPBS) and International Society of Biomedical Sciences (IFBLS). Therefore, it is adapted to the training of Scientists capable of performing all kinds of diagnostic Examinations and serving the Profession of Biomedical Scientist as defined by the Biomedical Sciences Societies.

At the same time, **it is in accordance with the Aims and Objectives of equivalent Departments of Biomedical Sciences abroad**, as can be seen from the content of the curriculum of the Departments and the possibilities of vocational rehabilitation of their graduates.

In particular, the Undergraduate Study Program of the Department aims, in line with corresponding Departments abroad, to provide students with the necessary knowledge, in order to produce graduates of higher education suitably qualified to carry out laboratory medical examinations for the laboratory diagnosis of diseases, having knowledge of the factors that affect the variation of biological markers and the conditions that can affect the accuracy and reliability of their measurements. Qualified graduates able to work in any of the individual fields of their subject and to contribute actively and responsibly to the organization and regulation of the operation of their workplace, to the guidance and supervision of the application of techniques by the lower skilled staff of the workplace, and to the training of such staff. In particular, they can staff the following laboratory departments: microbiological-virological, biochemical, hematological, blood donation-blood bank, immunological-histocompatibility, nuclear medicine to perform radioimmunoassays (RIA), hormonal-endocrinological, toxicological, pathologic, cytological, molecular biology – genetics, experimental animals, or any other laboratory related to their field of study.

In addition, they are trained to be able to contribute to the development of science and technology in their area of expertise. It also provides them with the knowledge to work in any other workplace, based on their field of study, such as biomedical research, medical diagnostics manufacturing companies, research department of pharmaceutical companies, veterinary clinics, marketing of medical diagnostics, education etc., based on the relevant global experience and practice.

The **main Study Program areas include**, among others:
Biochemistry, Biology-Molecular Biology, Biotechnology, Genetics, Clinical Chemistry, Haematology, Immunology, Microbiology, Microbiology, Mycology, Virology, Parasitology, Histology - Medical Cytology, Pathological Anatomy, Pharmacology-Toxicology, Molecular Diagnostics.

The expected knowledge, skills, competences and learning outcomes of the Curriculum are summarised as follows:

Knowledge

The knowledge provided includes, the teaching of basic courses such as: Chemistry, Medical Physics, Biochemistry, Biology, Biotechnology, Genetics, General Microbiology, Anatomy, Physiology, etc. which provide the background that will allow the understanding of the physiological functions of the human body and their disorders, as well as the understanding of the operating principle and the correct application of most diagnostic methods that will be taught in the individual courses. It also includes specialization courses, such as courses in Hematology, Clinical Chemistry, special courses in Microbiology, Virology, Immunology, Pathological Anatomy, Cytology, etc., which refer specifically to the various pathological conditions, the changes of various biological markers in biological fluids and tissues, the determination methods and the proper selection and implementation of the methods. Within the specialization courses, students are taught the pathophysiology of diseases and diagnostic methods with emphasis on the principle of diagnostic techniques, their sensitivity and reliability. Finally, special infrastructure courses are taught such as English terminology, Laboratory Safety, Research Design, Statistics, Informatics, Experimental Animals, etc.

Skills

During the Laboratory Practices, students acquire the necessary skills for the practical implementation of the diagnostic techniques they have been taught. They learn the use and control of the required specific equipment with application to the types of devices that constitute the equipment of the Department's laboratories and reference to other types of similar equipment. The ability to apply the knowledge is acquired through the students' Laboratory Practices and their participation in Practical Exercises, which take place in almost all the courses of the Department. As part of the Practical Training, which takes place during the 8th semester of their studies (compulsory) and additionally after the end of the courses of the 6th semester (optional), students have the opportunity to apply their knowledge and skills in real work conditions of all Departments of Hospitals and Diagnostic Centres and in general of their future workplaces, getting to know their organization and the mode of operation, obtaining at the same time significant experience. Students also exercise critical thinking, information gathering and analysis, as well as analytical thinking and practice.

During laboratory courses, students are involved in, handling human biological fluids, detection, classification and study of pathogenic microorganisms, investigation of agents of pathogenicity and resistance, laboratory diagnosis and contribution to the treatment and prevention of infectious and contagious diseases. In particular, laboratory practice includes the management of clinical biological fluids, microscopy, their culture, bacterial and fungal identifications of isolated bacteria and fungi and their antiviral therapy.

Competence

During their studies, students acquire the ability, to understand in depth the pathophysiology of diseases and their correlation with the biomolecules identified in biological fluids during the application of diagnostic techniques, to have an in-depth understanding of the principle on which diagnostic techniques are based, to understand the factors that may lead to false results and the necessary procedures to prevent or correct them. To understand the differences in diagnostic techniques in relation to the likelihood and the particular circumstances of false results, their suitability for specific population groups and their compatibility with the available equipment.

Awarded title and level of qualification

The Department's Study Program provides its graduates with a four-year Biomedical Sciences degree, 240 ECTS (Bachelor's Degree - level 6 according to the EQF, European Qualifications Framework, Bologna).

Career Prospects for Graduates

Graduates of the Department of Biomedical Sciences have registered professional rights in accordance with Goverment Law 4999 (Official Gazette 225/7-12-2022, article 32).

Furthermore, according to Presidential Decree 85/2022 on the determination of qualifications for appointment to public institutions (Qualification List - Classification), graduates of the Biomedical Sciences degree program, are included in the Specialty 3 of Medical Laboratories, Branch 3 of the Biomedical Sciences of Health Sector of University Level Education Category (PE).

Graduates are qualified for employment in institutions providing services related to their field of study, both in public and private sectors. In particular, they can staff the following laboratories: microbiological-virological, biochemical, hematological, blood donation-blood bank, immunological-histocompatibility, nuclear medicine to perform radioimmunoassays (RIA), hormonal-endocrinological, toxicological, pathologic, cytological, molecular biology – genetics, Laboratory animals, or any other laboratory related to their field of study.

More specifically, their responsibilities include the following: a) give instructions to examinees for their appropriate preparation and the correct collection of the sample for each examination, b) take the sample, c) receive the samples presented to the laboratory, d) prepare the samples to be examined, e) prepare all necessary materials, reagents and solutions, f) prepare smears and perform staining techniques, g) prepare and check any type of instrument and machine to be used, h) undertake responsibly the application of all modern scientific methods that have in relation to the performance of the laboratory tests, i) evaluate the quality result (technical know-how) and sign the performance of the technological part of all the laboratory tests they carry out, j) contribute to the laboratory quality-control procedures.

In addition, at the Blood Donation Laboratory - Blood Bank, they instruct prospective blood donors - patients on the proper preparation before blood collection, prepare blood derivatives (PLT, FFP, NEOCELLIS, etc.), wash the red blood cells (to be transfused), participate in blood group determinations, cross-matching, direct and indirect Coombs, serological determinations for blood-borne diseases and laboratory processes for the prevention of thalassemia.

They also participate in the organisation and management of their workplace, in particular:

A. laboratory facilities design

B. selection of equipment (machines - instruments)

C. selection of the most appropriate laboratory methods

D. members in the committees for the supply of consumables

E. monitoring the quality control of results

F. record keeping

G. training of laboratory staff

H. research studies of the laboratories

I. supervising the proper, periodic maintenance and cleaning of machinery, instruments and devices and implementing the required hygiene and safety rules.

Job opportunities in Greece:

Public Hospitals (Laboratories)
Private Clinics (Laboratories)
Diagnostic Centres (Laboratories)
Police Forensic Laboratory
Pharmaceutical companies (Research & Development Department)
Medical Diagnostics Production Companies
Veterinary Clinics (Laboratories)
Stem cell banks
Research projects
Teaching in Technical Schools
Teaching in Institutes of Vocational Education and Training
Teaching in Higher Education
Medical Visitors

Main Employment Sectors Abroad:

Hospitals & Diagnostic Centres (Laboratories)
Pharmaceutical companies (Research & Development Department)
Medical Diagnostics Manufacturing Companies
Marketing of medical diagnostics
Research Programmes (Universities)
Veterinary clinics
Forensic Laboratories
Military laboratories
Education

5. INFORMATION on the CURRICULUM of STUDIES

Duration of Studies

The first cycle of studies in the Department of Biomedical Sciences, School of Health Sciences of the International Hellenic University requires attending an Undergraduate Study Program (USP), which includes courses corresponding to a minimum of **240 credits (ECTS).** It typically lasts four (4) academic years leading to the award of a degree. In each academic year, the student chooses educational activities corresponding to 60 credits (ECTS), (Par.2b, Article 30,LAW 4009/2011).

Undergraduate studies are conducted with the system of semester courses, the fall semester and the spring semester, each of which comprises 13 weeks of teaching.

The maximum duration of studies in the Department is the eight (8) academic semesters for the award of the degree, extended by another four (4) aforementioned academic semesters i.e., a total of 12 semesters (6 years). After the completion of the maximum period of study, the Board of Directors of the Department issues an act of deletion (article 76, par. 1, Law 4957/2022).

Students who have not exceeded the maximum duration of studies may, after applying to the Department Secretariat, interrupt their studies for a period of time that does not exceed two (2) years. The right to interrupt studies may be exercised once or partially for a period of at least one (1) academic semester, but the duration of the interruption may not cumulatively exceed two (2) years, in case it is partially provided. Student status is suspended during the interruption of studies and participation in any educational process is not allowed (article 76, par. 4, Law 4957/2022).

Admission and Registration

Students can be registered in the Department of Biomedical Sciences of the I.H.U. after passing the entrance exams to higher education, by transfer from other Departments or Schools,or by qualifying exams in accordance with the current legal regulations .

The registration of newly admitted students takes place at the Department's Secretariat within the time limits defined each time by the Ministerial Decisions.

The passing candidates of the Panhellenic examinations who completed their registration through the electronic platform of the Ministry of Education and Culture must carry out the identity check at the Secretariats of their Departments, submitting the following supporting documents

1. Application for registration (printed from the website of the Ministry of Education),
2. Photocopy of identity card (ID),
3. One (1) photo (ID type),

For the remaining categories of new entrants, the required supporting documents are announced on a case-by-case basis

Academic Year Calendar

The academic year starts on September 1 every year and ends on August 31 of the following year. The educational work of every academic year is organized in two semesters, the winter semester and the spring semester, each of which comprises 13 weeks of teaching and one examination period (three weeks).

Every September, before the start of the winter semester, there is an extra examination period in which students can be examined on the totality of the courses offered in the spring and winter semesters. For courses and workshops in which students are examined with progress tests and/or assignments there is no obligation for students to re-sit exams in September.

Winter semester courses start in the last week of September and end in mid-January, followed by the first exam period of the winter semester.

Spring semester courses start in late-February and end at the end of May, followed by the first exam period of the spring semester.

Exact dates are determined by the Executive Committee.
Every semester has two exam periods:

Winter semester courses are examined during the exam period January-February; re-sit exams are held in September.

Spring semester courses are examined during the exam period of June; re-sit exams are held in September.

Every semester, and before the beginning of each exam period, students have the right and obligation to evaluate their courses and instructors, aiming at the improvement of the quality of their studies.

More information is available at the website of the Quality Assurance Unit (MODIP-I.H.U. MODIP - I.H.U./) and the website of their Faculty/School.

HOLIDAYS
Courses or exams are not held in the two months of summer holidays (July and August). Holidays also include:

Christmas Holidays: December 24 to January 7.

January 30: The Three Patron Saints of Education Day

Clean Monday

March 25. The Annunciation / National Anniversary of the 1821 Revolution against the Turkish Rule

Easter Holidays: from Holy Monday to Thomas Sunday

May 1st: Labor Day

Holy Spirit Day: Monday (after Pentecost).

October 28: National celebration

November 17: Students' uprising in the National Technical University of Athens against the junta in 1973

On the feast day of the Patron Saint of the city of Thessaloniki, October 26.

Specific Arrangements for Recognition of previous Studies

Recognition/Accrediation of courses to students who entered by Admission Exams for Graduates

1. Students admitted to the Department may recognise courses which have been proven to have been taught and successfully examined in their home Department at a domestic university, provided that these courses correspond to courses of the Department's curriculum. The total number of recognised courses may not exceed 30% of the total number of courses in the Department's curriculum. The above shall also apply to students who are transferred in accordance with the regulations in force at the time.
2. 2. The recognition of the courses, according to the previous paragraph, is carried out by decision of the Department's Assembly and the students are exempted from the examination of the courses or exercises of the curriculum of the host Department taught in the Department of origin, and may join a different semester from the one of their registration.
3. 3. For this purpose, the student submits an application with the required documents for the courses from which he/she requests to be exempted. In order to join a semester other than the semester of his/her registration, the student must submit a request immediately after his/her registration for all the courses and required supporting documents that justify a change of semester.
4. Students must submit a written application to the Department's Secretariat together with a certificate of academic record, certified by the Secretariat of the Department of origin, accompanied by the syllabus of the courses they have taken and the workshops they have attended. The application and the attached documents are forwarded to the tutor in charge, who recommends to the Department's Assembly the recognition or not of the courses and/or exercises of the applicant student.

Course declaration - Renewal of registration

Each student is expected to register at the Department at the beginning of each semester on the dates set by the Dean's Office of the School and to list and declare the courses of the curriculum he/she wishes to attend and which are taught during the semester (course declaration). In particular, course declarations are carried out approximately from 1 October to 15 November for the winter semester and from 1 March to 15 April for the spring semester, within deadlines set by the Dean's Office of the School. The maximum number of credit units corresponding to the semester courses that each student may register for, per semester, shall not exceed a maximum of thirty (30). This limitation does not apply to the declaration of courses or workshops from previous semesters with a non-qualifying final examination grade of the student, the attendance of which is assessed as being sufficient.

Registration and course declaration procedures are carried out by students electronically through the Institution's information system. The declaration of courses is carried out according to the rules established by a decision of the Department's Assembly. The declaration may not include prerequisite courses for which the prerequisite requirement has not been fulfilled. Both the registration and the declaration of courses of the students in each semester are jointly necessary actions in order for the student to have an active presence at the institution. Students who have not submitted a course declaration shall not be admitted to the examinations for that semester for those courses and, if they have nevertheless taken them, their performance shall not be graded and, if they have nevertheless been graded, any passing grade they may have received shall not be taken into consideration and shall not be recorded in any examination period. The Department's Assembly shall decide on belated declarations.

For newly enrolled students, the first semester course declaration is submitted together with the application form for their first registration in the Department.

5.1.1 Statement of Preference for Placement in Laboratory Classes

The curriculum of the Department of Biomedical Sciences includes theoretical courses (lectures), combined courses including theoretical and laboratory sections, tutorials and a strictly laboratory courses.

The laboratory courses, as well as the laboratory part of the combined courses, take place in specifically equipped laboratory classrooms, of about 20-30 students, depending on the available laboratory space.

Based on the number of students who have enrolled for the course and on the capacity of the laboratory classroom, the appropriate number of laboratory classes is designated and included in the Department's weekly timetable of teaching.

For each laboratory course, a class selection application is created on the online education platform of asynchronous learning Moodle, where students are invited to choose the class they wish to attend on selected dates.

Newly enrolled first semester students, are placed in the laboratory classes in alphabetical order by the Department staff members in charge of the respective Laboratories.

Academic ID- Student pass

Since 09/24/2012, undergraduate, postgraduate and doctoral students of all Universities in the country can electronically apply for the issuance of their academic identity card at:

Ηλεκτρονική Υπηρεσία Απόκτησης Ακαδημαϊκής Ταυτότητας - Informational Portal (minedu.gov.gr)

The Academic Identity is strictly personal. The suspension of the student status for any reason, automatically terminates the right to hold the Academic Identity Card, which in this case, should be returned to the Department's Secretariat.

Students who study at the University within the framework of international or European educational or research exchange and cooperation programs, for as long as their studies last, they can get a Special Ticket (PASO) with which they are qualified for discounted price in transportation.

Teaching Aids and Resources

The educational work is supported by the corresponding coursebooks, which are provided free of charge to the students, through the Electronic Integrated Book Management Service (Eudoxus). Students, after submitting the electronic declaration of courses each semester, also make the corresponding declaration of books on the web portal of the "EUDOXUS" system (http://eudoxus.gr/), with which they declare the coursebooks they wish to receive.

In order for a student to be able to declare the textbooks, a username and password are required, which are issued by the Department's Secretariat and are also used for the other electronic services of the Institution. The student enters a central web page of the Central Information System (CIS) from where he/she is authenticated. There he/she is informed about

the approved textbooks of the Department's courses and selects the ones he/she is entitled to (one textbook per course he/she has registered). The professor of each course has previously recommended one or more textbooks suitable for the study of the course. Then, the student receives directly from the CIS an SMS and an e-mail with the PIN code, with which he/she receives the selected textbooks either from the Library of the University Campus of Serres or Kavala or Thessaloniki, or from another contracted bookstore that will be indicated to him/her, or by any other procedure that will be qualified by the Ministry of Education and the Eudoxos service (e.g. (e.g. by courier services), on working days and hours, upon presentation of his/her identity card.

Students are eligible for free textbooks until they have completed the minimum number of semesters required for graduation plus four (4) semesters, with the condition that they have not previously obtained a free textbook for the same course.

According to the Institution's Internal Regulations (Issue B' 4889/06.11.2020 Official Gazette 54447), if students select additional elective courses than those required for the degree, the right to select and obtain free textbooks does not extend to the additional courses they selected and examined, even if they are credited to their degree.

Course of Study

The Undergraduate Study Program (USP) of the Department of Biomedical Sciences provides 4 years of study (240 Ects) including theoretical and laboratory education, practical exercises and internship.

The USP of the Department of Biomedical Sciences supports 51 courses of which 41 are compulsory core courses (CC) , 9 are compulsory elective courses (EC) and 1 is optional (OC). The USP includes General Background Courses (GBC), Special Background Courses (SBC), Specialty Courses (SC and General Knowledge Courses (GKC).
The curriculum of the Department of Biomedical Sciences includes theoretical courses (lectures), combined courses including theoretical and laboratory sections, tutorials and a strictly laboratory course.

In order to ensure the smooth attendance of the courses, some of them are designated as prerequisites for the attendance of other courses. This means that both theoretical and laboratory sections of the prerequisite courses must be successfully completed in order to be able to follow the courses that have these as prerequisites.

According to the Curriculum, a five-month Practical Training / Clinical-Laboratory Training of students is mandatory. The Practical Training can take place during the 8th semester as long as the students have successfully completed the Specialty courses and the Laboratory section of all courses. In addition, there is the possibility of an Optional Internship of 2 months (40 hours/week) during the summer of the 6th semester. The Optional Internship like all Optional courses is listed in the Diploma Supplement, as well as the ECTS to which it corresponds. However, the Workload and its ECTS are not added up to the Workload and ECTS of the Semester.

The diploma/thesis is one of the elective courses of the USP and the only course that covers both the 7th and the 8th semesters of study. Students who choose a thesis are required to

register for it as a course in both 7th and 8th semesters. Completion and examination of the diploma/thesis takes place at the end of the 8th semester.

The educational process differentiates according to course type

Briefly, the education tools may include:
- Face-to-face or distance learning lectures
- Laboratory exercises for the implementation of laboratory and experimental techniques and methods (for courses that have a laboratory section).
- Assignment/presentation of projects by students
- Video, presentations, links and other material presented during the lectures and uploaded to electronic platform moodle.
- Questionnaires/self-examination quizzes

The educational process of each course includes:

Theoretical courses

Theoretical courses are not compulsory, but their attendance is considered important for a better comprehension of the subject and for facilitating the student in his/her exams. This also applies to the theoretical part of the combined courses.

Combined courses

Combined courses include theory and a laboratory section (laboratory exercises).

Laboratory Courses

There is one strictly laboratory course that includes only laboratory practice (Blood specimen collection)

Laboratory Courses / Laboratory section of combined courses

Attendance at the laboratory courses or laboratory section of combined courses is compulsory.
These courses include the performance of laboratory exercises with students applying laboratory techniques relevant to the subject of each laboratory and training in the use of relevant laboratory equipment.
Satisfactory attendance of the Laboratory section of a course implies the student's attendance at a minimum of 80% of the Laboratory Exercises and Practice Exercises (if any), implementation of requested laboratory techniques, delivery of a laboratory report or any other assignment assigned by the instructor.
Satisfactory attendance of the laboratory section of the course ensures that students are eligible to attend the final Laboratory Examination.

Tutorials (Practical Exercises)

Attendance at the practical exercises is also compulsory. Tutorials (Practical Exercises) are part of the laboratory section of the course and usually include an analysis of the theoretical background of the laboratory techniques that students will practice in the Lab.
Each Tutorial precede the corresponding laboratory exercises and aim to improve the student's preparation. Tutorials may also be part of a theoretical course. In this case it is intended to provide the student a background in problem solving and introduce the students to computer programs (e.g. Biostatistics) or hardware that can be used in the context of hands-on applications of the course (e.g. Basic Histology & Methods of Study).

ECTS credits: Each course of the Department's Curriculum is characterized by a number of credits.

The ECTS credits, which are allocated to each course, are a measure of the workload required to complete the objectives of an Academic Program by each student

Grade Scale: Grading is expressed as a numerical scale from zero to ten (0 - 10), and five (5) is the minimum passing mark.

For a combined course to be considered successfully completed, the student must score successfully in both the theoretical and laboratory sections of the course. The marks obtained by the student in each of the two sections are added up to the final grade of the course according to the credits that determine the weighting of the theoretical and laboratory sections of the course. If the student fails in one of the two sections of the course, the student shall repeat only that section.

Examinations

1. The exams sessions are held only after the end of the winter and spring semesters during the periods January - February and June - July, for the courses taught in these semesters, respectively. Students are entitled to take examinations in the courses of both (2) semesters before the beginning of the winter semester during the September session.

2. More specifically, the winter semester examinations begin one (1) week after the completion of the semester courses, last three (3) weeks, and are normally followed by one (1) free week before the start of classes for the spring semester. Spring semester examinations begin one (1) week after the completion of the semester courses and last three (3) weeks.

Each examinee must report to the designated room for the examination no later than fifteen (15) minutes prior to the scheduled start time. In any case, after the distribution of the subjects, each student is not allowed to enter. In exceptional circumstances, and in the judgment of the responsible professor, a student who has arrived late may be allowed to enter, provided that the delay does not exceed thirty (30) minutes and provided that no other student has left the examination room. This student is not entitled to additional examination time.

Any changes in the arrangement of examinees within the room or between the rooms used are the responsibility and right of the instructor and supervisors.

The examinee writes his/her details (name, registration number) on the examination paper and the supervisor then identifies him/her on the basis of his/her academic (student) identity card. In case of impersonation, the persons involved will be referred to the Department’s Assembly for disciplinary action.

Before distributing the examination forms, candidates must remove any aids other than those expressly provided for in the examination regulations or authorized by the examiner.

Mobile telephones or any other means of communication must not be used under any circumstances during the examination. They must be switched off. Turning them on is considered an attempt to cheat.

No single student is allowed in the examination room. The supervisors must ensure that at least one additional student remains in the room until the last student has handed in his/her paper.

RE-EVALUATION OF EXAMINATION RESULTS

If a student fails more than three (3) times in a course with grades higher than one (1) and different from each other, he/she may, upon his/her request and the decision of the Dean, be examined by a committee of three professors of the relevant School, who have the same or related subject matter and are appointed by the Dean. The professor in charge of this examination shall be excluded from the committee. The application shall be submitted to the Secretariat of the Dean's Office of the Faculty and notified to the Chair of the Department. In case of failure, the Department Assembly shall decide on the status of further participation in the course examination and on the measures to be taken to ensure the procedure.

Bachelor's Diploma Thesis

Students can select the diploma thesis as an elective course of 10 ECTS credits distributed by 5 ECTS during the 7th and 8th semester. The diploma thesis must be related to the subject of their studies.

Each teaching member of the Department undertakes the supervision of a number of theses.

For each thesis topic, the member who supervises the progress of the topic, guides the students, ensures the provision of the necessary facilities in terms of space and equipment. Furthermore, he/she shall recommend to the President of the Department the distribution of the necessary funds for consumables, etc. Supervision of a thesis may be assigned to full-time faculty members of another Department depending on the requirements of the subject, following decisions of both Departments.

The development of the thesis may be extended beyond the end of the last semester of study, depending on the complexity and requirements of the topic.

The theses are assigned to all students twice a year by decision of the Department’s Assembly. The exact date of notification and application for the assignment is announced by the department's member in charge of theses.

Upon completion of the thesis and after approval by the supervisor, the thesis is submitted through the protocol to the Department. The Department's Assembly shall set a date on which the theses shall be presented before a three-member committee of the Department's teaching staff. All Department members and students of the Department may attend this presentation.

Work placement (internship)

According to the Curriculum, the Practical Training / Clinical-Laboratory Training of students is mandatory.

The purpose of the students' internship is to train them within the field of knowledge of the department.

The Practical Training/Clinical-Laboratory Training includes the training in departments of hospitals or diagnostic centers, clinics and generally in places of their discipline in Greece or abroad. Part of the Internship/Clinical-Laboratory Training may also be carried out in research laboratories of a similar discipline.

During the Internship/Clinical-Laboratory Training in departments of hospitals or diagnostic centers, students should be trained in different fields and become familiar with basic technical tests performed in each field. These areas may be biochemical, haematological, microbiological, histopathology, cytology, molecular diagnostics, serological-immunological, blood donation. In addition, during their practical training, students must carry out a sufficient number of blood collections.

The compulsory traineeship corresponds to 5 months of five-day work (600 hours) and is carried out in either public or private sector. The number of hours of practical training per day is set at 6 in order to allow students to take elective courses during the 13 weeks of the semester. Compulsory practical/clinical laboratory training takes place during the last semester of studies (8th semester) and only if the student has successfully completed 2/3 of the courses of the curriculum and corresponds to 20 ECTS. He/she must also have a satisfactory attendance of the laboratory section in all courses that are compound ones.

In addition to the Compulsory Practical Training, students may carry out a two (2) months Optional Practical Training/Clinical Laboratory Training of 320 hours after the completion of the courses of the 6th semester, during the summer months, 8 hours x 5 days x 8 weeks or equivalent, corresponding to 15 ECTS.

Furthermore, internships can be carried out in European Union Educational Institutions, hospital and research centers, within the framework of the ERASMUS program or other European programs.
An Internship Committee consisting of three (3) members of the teaching staff ensures for:
- The search for new internships.
- Assessing that the workplaces in which the traineeships are to be carried out are suitable.
- The allocation and distribution of traineeships.
- The correct implementation of the traineeship by the students

During their internship, students are supervised by the internship supervisor, who is appointed by the Department for this purpose.

The Department's Internship Committee conducts the examination of the Internship which is held on a date decided by the Department. The examination shall focus mainly on testing knowledge of practical and relevant issues relating to the organization and performance of the internship work and procedures. The marks of the internship/clinical-laboratory training will be 50% from the examination score and 50% from the internship booklet contents.

Degree Grade - Declaration of Graduation

Students complete their studies and are awarded a Degree when they have completed 8 semesters of study, have successfully completed the courses prescribed by the curriculum and have acquired the necessary 240 credits.

Students of the Department who successfully complete their studies are awarded a "Degree".

The student becomes a graduate on completion of his/her studies even before he/she is awarded the diploma.

A prerequisite for the award of the degree is the swearing in of the graduate in a public ceremony. In cases where attendance is not possible, the swearing-in ceremony is carried out in accordance with a procedure determined by the Rector. A certificate of successful completion of studies may be issued before the swearing-in ceremony.

The degree certifies the successful completion of the student's studies and indicates the final grade with an accuracy of two decimal places. This grade is in order of success: "Excellent" from 8.50 to 10, "Very Good" from 6.50 to 8.49 and "Good" from 5 to 6.49.

The diploma degree is awarded, as defined by the regulations in force, provided that the student has successfully completed the requirements of the program of study and has acquired the required number of credits for the degree or diploma. If the student has passed more than the minimum number of courses necessary for the calculation of the degree or diploma grade, the remaining courses are indicated on the student's transcript of records and Diploma Supplement, with their grade and credit hours, but the grade of these courses shall not be taken into account for the calculation of the final degree or diploma grade.

Graduate Certificate - Transcript of Records –Diploma Supplement

Upon completion of their studies, graduates receive a Graduation Certificate.

Graduates are awarded a Diploma, Analytical Score (Transcript of records) and a Diploma Supplement.

6. STAFF OF THE DEPARTMENT

The Staff of the Department

The staff of the Department of Biological Sciences is divided into Teaching and Educational Staff (D.E.P.), Special Technical Scientific Staff (E.DI.P.), Laboratory Teaching Staff (E.TE.P.) and Administrative Staff (A.S.) with corresponding responsibilities.

The Department of Biological Sciences is staffed with 13 (D.E.P.) School members, 1 (E.DI.P.) members, 0 (E.TE.P.) members and 4 Administrative staff members.

The members of the Teaching and Educational Staff belong to four academic ranks : Professors, Associate Professors, Assistant Professors and Lecturers, while their teaching work is supported by the members of Laboratory Teaching Staff and Special Technical Scientific Staff At the same time, the educational process of the Department is also supported by temporary educational staff, which consists of Scientific Associates, Laboratory Associates and Academic Scholars.

TABLE of the EDUCATIONAL STAFF

A/A	FULL NAME	TITLE	SUBJECT AREA/ SPECIALTY
1.	Skepastianos Petros	Professor	Microbiology - Hematology MD with Specialization in Medical Biopathology - Clinical Microbiology Doctor of Medicine (Medical Microbiology) / Specialty in Medical Biopathology - Clinical Microbiology
2.	Karapantsos Elias	Professor	Human anatomy with specialization in the anatomy of the head and the cervical sensory organs MD with Specialization in Emergency Medicine and Otolaryngology/ Specialty in Anatomy
3.	Mitka Stella	Professor	Clinical Chemistry - Medical Microbiology. MD with Specialization in Medical Biopathology - Clinical Microbiology / Specialty Medical Biopathology – (Microbiology)
4.	Eleftheriou Phaedra	Professor	Biochemistry Chemist, PhD in Chemistry / Specialty Clinical Chemistry - Biochemistry
5.	Chatzidimitriou Maria	Professor	Medical Biopathology - Medical Microbiology - Medical Immunology MD, PhD, with Specialization in Medical Biopathology, Professor of Microbiology and Immunology

6.	Makri Stella	Associate Professor	Chemistry - Clinical Chemistry MD with Specialization in Medical Cytology
7.	Papoutsi Androniki	Associate Professor	Biology - Genetics Biologist, Doctor of Medicine
8.	Papaliagas Vasileios	Associate Professor	Functional Physiology MD/MSc, PhD, Neurologist / Specialty in Neurology
9.	Lymberaki Eugenia	Assistant Professor	Chemistry - Clinical Chemistry Chemist, Doctor of Medicine in the field of Biochemistry / Specialty in Chemistry -
10.	Konstantinidou Vassiliki	Assistant Professor	Medical Biopathology - Laboratory Hematology - Clinical Chemistry MD with Specialty Medical Biopathology - Clinical Microbiology. Doctor of Medicine (Haematology)
11.	Giannakou Ourania	Assistant Professor	Freshwater Benthic Ecology Biologist, Dr. Vet. Medicine
12.	Bobos Matthew	Assistant Professor	Medical Pathological Anatomy MD with Specialization in Pathological Anatomy.
13.	Andreadou Eleni	Assistant Professor	Chemistry - Biochemistry - Clinical Chemistry Chemist, PhD in Chemistry in the field of Biochemistry

TABLE of the Special Technical Laboratory Staff (E.TE.P.), Special Teaching Laboratory Staff (E.D.I.P.)

A/A	FULL NAME	CATEGORY	SUBJECT AREA/ SPECIALTY
1.	Psycha Anastasia	Special Technical Scientific Staff	MSc "Care of Diabetes Mellitus"

TABLE of the ADMINISTRATIVE STAFF

A/A	FULL NAME	
4	Katsarou Athina	Head of the Secretariat
5	Kyriakoudi Ioanna	Secretary
6	Mayridou Maria	Medical Laboratory Technologist MSc "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases"
7	Hatzifotiou Maria	Secretary

Address:
Department of Biological Sciences,
Campus Alexandrian -Sindos,
14th klm. Thessaloniki-Sindos,
ZIP Code 57400 Thessaloniki,

Tel: +302310013512
FAX : -------
info@bmsc.ihu.gr,
akatsar@admin.teithe.gr,
URL:http://www.mls.teithe.gr/

Administration/Secretariat Office: Duties and working hours

The Department Secretariat is responsible for student and administrative matters.

Student services are provided on all working days, and during the hours of 10.00 am to 12.00 pm, at the offices of the Department Secretariat, located at the entrance of the building housing the Department.

Student issues include:

- Registration Procedures
- keeping the students' records, which include their grades, registration renewals every semester, and information about scholarships,
- granting Certificates and Degrees,
- granting certificates for legal use,
- issuing paper forms required for the students' Internship,
- creating/filling in student lists, according to their course enrolment declaration
- registration cancellations of students who have two consecutive non-renewal of registration or three non-consecutive non-renewal of registration

Regarding first-year student registrations, transfers and registration of those passing the qualifying exams in the Department of Biomedical Sciences of the I.H.U., the following apply:

Registration Renewals - Course Declarations are carried out through the Electronic Secretariat at the beginning of each Semester, and for a period of approximately fifteen (15) days. Each student has his/her own personal code, obtained from the Department's Secretariat, with which s/he declares courses electronically.
After the lists of successful candidates in the National Examinations are sent by the Ministry of Education and Religious Affairs, the registration deadline for new entrants is set, which is common for all higher education institutions in our the country. This deadline should not be missed, otherwise latecomers lose the right to register. Registration of new entrants takes place in September.
From November 1 to 15, relevant application forms are submitted for:
- Transfers for financial, social, health reasons, etc., as well as for the children of large families, unless otherwise specified by law.
- Enrolment of Higher Education Graduates, who succeeded in qualifying exams, held every year, at the beginning of December.

The Role of the Academic Advisor (Tutor)

The institution of the Academic Advisor (Tutor) has been implemented by the Department of Biomedical Sciences for a long time. Each year, by decision of the Department, a member of the Teaching and Educational Staff is designated an academic advisor for every first-year student for information and guidance in study matters. The academic advisor informs the students about his/her role and invites them to an introductory meeting. Students are required and encouraged to communicate regularly with their Academic Advisor,discuss educational issues and utilize his/her knowledge and experience throughout all the years of their studies.

Evaluation of the Educational Project

1. All registered students of the International Hellenic University participate in the evaluation process of the International Hellenic University. The evaluation is carried out in accordance with the guidelines, procedures and standards of the University's Quality Assurance Unit (Quality Assurance Unit), which follow the standards of the National Authority for Higher Education. Students participate in the Internal Evaluation of the Department and the Institution, a periodically recurring process, through specific questionnaires, which provide them with the opportunity to express their views anonymously. The completion of these confidential questionnaires is very important, as it gathers useful information about courses, lecturers and infrastructure, which is used exclusively for the planning, development and continuous improvement of the overall educational work and services offered to students.
2. Students who have registered for undergraduate, laboratory and postgraduate courses have the possibility of completing questionnaires for these courses. The electronic completion of the questionnaires is carried out through the electronic secretariat of the single information system of the institution.

7. FACILITIES

Laboratory Spaces and Equipment

Laboratories: 9

Research facilities: 8 (Total: 186 m2, 35 workstations)

Computer Node: 1 (shared with Dept. of Nursing)

Computer Classroom (20 seats, School of Health Sciences)

Research Laboratory areas

1. Biochemistry - Clinical Chemistry - Clinical Chemistry - Virology - Molecular Diagnostics research laboratory area of 50 m² with 6 workstations (room O12B) on the 1st floor

2. Biochemistry 1 research laboratory area of 12 m2 with 2 workstations (room O15) on the 1st floor

3. Biochemistry 2 research laboratory area, of 12 m² with 2 workstations (room O16) on the 1st floor

4. Medical Biotechnology - Genetics - Molecular Diagnostics research laboratory area, of 40 m² with 8 workstations (room O11 on the 1st floor)

5. Research laboratory for Medical Cytopathology, Classical and Molecular Medical Histopathology - Cytopathology, 20 m², with 2 workstations (room O14B on the 1st floor)

6. Microbiology II - Immunology research laboratory area, of 20 m², with 2 workstations (room O21B on the 1st floor)

7. Classical and Molecular Mycology - Parasitology and Medical Microbiology I research laboratory area, of 80 m², with 12 workstations (room I7, on the ground floor)

8. Hematology - Thrombophilia research area, of 20 m² with 1 workstation (room I6, on the ground floor).

Research Laboratory Equipment

a) Research laboratory areas **1,2** and **3 (**Biochemistry - Clinical Chemistry - Clinical Chemistry - Virology - Molecular Diagnostics), feature instrumentation for the performance of spectroscopic techniques (photometric, fluorimetric and chemiluminescence), immunological techniques (ELISA, EIA), chromatographic techniques, electrophoretic techniques, PCR and DNA analysis techniques, cell culture and tissue culture.

Detailed recording listed:

Stirring devices:- vortex type stirrers, - magnetic stirrers - mechanical stirrers with propeller,

Homogenizing - Extraction apparatus: - potter-type homogenizer with teflon piston, - homogenizer with knives

Heating devices: - Heating eyes, - Heated magnetic stirrers, - Water baths - Heated plate for heating and cooling of microtubes.

Centrifuge devices: - Simple and refrigerated desktop centrifuges with heads selection (2), - swing-out head centrifuges (1), - ultra-centrifuge.

Electrophoresis devices: - Horizontal electrophoresis devices (2), - Vertical electrophoresis devices (2), - Two-dimensional electrophoresis devices (2), - Western blot electrophoresis apparatus (1), - Sequencing gel electrophoresis. Densitometer for quantification of electrophoresis results - HPLC Chromatography apparatus

Photometers: - photometer (1) - photometers for measuring ELISA microtitration plates (1) - photometer suitable for measuring ELISA microtitration plates, capable of using fluorescence and chemiluminescence (1) - a pH meter

DNA analysis devices: - DNA polymerase chain reaction (PCR cycle) apparatus (2),- UV plate - a chamber with visible and UV plate and an adapted camera for observing and photographing gels,

Incubation chambers: - Simple incubator, shaking incubator, CO2 incubator

Dehydration - condensation devices: - Vacuum gel dessication apparatus, - Lyophilisation device.

Autoclave (2)

- Electronic precision scales (2)- Inverted microscope- Electronic precision scales (2)- Vertical laminar flow cabinet, class II (2) - fume hood (1)- Coolers (4-6 oC) (2), - freezers (4-6 °C) (2), - Distillation apparatus- Reverse osmosis apparatus.

There are also micro instruments such as:

- Volume adjustable micropipettes, different kinds of small instruments, such as: separating funnels, volumetric funnels, siphons, spherical and conical flasks, volumetric flasks and cylinders, test tubes, beakers of various sizes.

b) Research laboratory area **4 (**Medical Biotechnology - Genetics - Molecular Diagnostics)**,** features instrumentation for the performance of molecular diagnostic, genetics and biotechnology techniques.

Detailed recording listed:

Deep freeze freezer -70o C

- Refrigerator with freezer -20o C
- Freezer -20o C, small size
- Liquid sterilization chamber (121o C, 1 Atm), adjustable, with electronic control
- Dry Incubator 30-100o C
- Biological safety chamber Class II (Laminar Flow)
- PCR reaction preparation chamber (PCR Working Station)
- Thermocycler with 25 positions for 0.2 ml/0.5 ml tubes (Eppendorf)
- Benchtop UV transilluminator
- Microcentrifuge 24 positions for Eppendorf tubes, max speed 20000xg (2)

- 12-position centrifuge for blood tubes, max speed 6000 rpm

- Shaking water bath with electronic control, ambient-100o C

- UV-Visible spectrophotometer

- Image processing and analysis system for agarose gel, with corresponding software and thermographic printer.

- Water Distillation System

- Water deionisation system (zalion column)

- Heated magnetic stirrer

- Microwave oven

- Dry heating bench with double head for 0,5/1,5 ml tubes (Heat-block)

- Electrophoresis power supplies (2)

- Horizontal electrophoresis devices (1 maxi, 3 midi, 1 mini)

- 2 vertical electrophoresis devices

- 1 optical microscope

- 1 Southern blotting apparatus

- 1 vortex/spin in one device, max speed 6000 rpm

- 2 vortexes max speed 2500 rpm

There are also micro instruments such as: 22 Single-channel, adjustable volume microprocessors with variable volume suction range, - Necessary micro-equipment and consumables for all molecular biology and molecular genetics testing procedures (stands, tubes, tips, etc.)

- Slide projector and adjustable display screen

c) Research laboratory area **5** (Medical Cytopathology, Classical and Molecular Medical Histopathology – Cytopathology) features instrumentation for the performance of the respective techniques.

   Detailed recording listed:

   - fume hood - Sterilization oven (1) - Microwave (1)- Microtome (1) - Freezing Microtome (1) - Water Bath (1) - Histokinette (1) - Spin tissue processors (2) - Centrifuge (1) - Cytophygocentre (1) - Tissue/immunostaining machine (1) - Liquid Phase Automated Cytology Machine (TriPath/USA) (1) - Thermocycler for slides (in situ PCR)

   - Optical microscope (1) - Nikon optical microscope with DS-Fi1-L2 digital video camera (1) - Observational optical microscope (1) - Refrigerator (1)

d) Research laboratory area **6 (** Microbiology II – Immunology) features instrumentation for the performance of the respective techniques.

   Detailed recording listed:

- Liquid sterilization bath (autoclave) (1) - dry heat sterilization oven (1) - Air-borne incubator (3) - Water bath (1) - Precision scale (1) - Water distillation apparatus

- Refrigerators (3) - Centrifuge (1) - Microscopes (optical and fluorescent)- Projector (1) – Computer – Nebulizer (1).

e) Research laboratory area **7 (** Classical and Molecular Mycology - Parasitology and Medical Microbiology I) features instrumentation for the performance of the respective techniques.

Detailed recording listed:

Dry heat Incubator (1) - CO2 incubator (1) - Heat-cooled chamber (1) - Liquid sterilisation oven (autoclave) (1) - Microscopes (2)

f) Research laboratory area **8 (** Hematology - Thrombophilia) features instrumentation for the performance of the respective techniques.

Detailed recording listed:

Microscopes (20), Co-observational microscopes (3), Camera operated microscope with computer link and projection screen (1), Benchtop centrifuge (1), Electrophoresis apparatus (1), Haematological analyzer (1), Blood collection chair (1), Template (1).

Teaching Classrooms

Department's classrooms: 2 (2x40 = 80 persons)

Infrastructure of The School Of Health Sciences (SHS) - I.H.U.

(Available for part-time use for the teaching needs of the Department)

Common use auditoriums serving the Department: 5

(Of these, one belongs to the School of Health Sciences and the other 4 to the I.H.U.)

-Oikonomou Auditorium (100 seats, SHS)

-Conference hall (150 seats, Conference Centre, SHS)

-Filippos Auditorium/Lecture Hall (150 seats, I.H.U.)

-Olympia Auditorium/Lecture Hall (150 seats, I.H.U)

-Alexandros Auditorium/Lecture Hall (500 seats, Foundation)

Student Training Laboratories

1. Haematology Laboratory (75 sq.m., 25 workstations)
2. Microbiology Laboratory (75 m², 25 workstations)
3. Mycology - Parasitology Laboratory (75 m², 25 workstations)
4. Chemistry - Biochemistry- Virology - Laboratory (50 m², 20 workstations)
5. Biology-Molecular Biology-Biotechnology-Genetics Laboratory (75 m2 , 25 workstations)
6. Immunology Laboratory (75 m2 , 25 workstations)
7. Clinical Chemistry Laboratory (50 m2 , 16 workstations)
8. Medical Cytology-Pathological Anatomy Laboratory (75 m2 , 25 workstations)

Figure 3: An illustrative presentation of laboratories and research areas of the Department of Biomedical Sciences.

1.Biochemistry - Virology - Chemistry Laboratory Classroom.

2. Biology - Genetics - Biotechnology Laboratory Exercise Classroom

3. Haematology Laboratory Classroom

4. Mycology - Parasitology Laboratory Exercise Classroom

5, 6. Biology - Genetics - Biotechnology Research Laboratory Area

Figure 4 . Highlights of the students' exercise.

1.Microscopic observation, Pathological Anatomy Laboratory

2. Quantitative determination, Biochemistry Laboratory.

3. Sample injection-HPLC.

4. Microtome handling, Pathological Anatomy Laboratory

5. Vertical flow cabinet work, Biochemistry Laboratory area

6. Semi-automatic analyzer operation, Clinical Chemistry Laboratory.

E-Learning

The web-based learning environment of the Department of Biomedical Sciences, School of Health Sciences, IHU, is located at the following URL:

Platform for Asynchronous Education

The e-platform enables academics to, among other things:

- upload presentations, useful files and links for students
- create assignments that can be submitted electronically
- create self-examination quizzes
- Assign students to work groups
- Communicate with students

Institutional Research Laboratories

The Department has an established **Laboratory of Biomedical and Molecular Diagnostics and Research** (Government Gazette 4239, 30-09-2020).

The aim of establishing and operating the Biomedical and Molecular Diagnostics and Research Laboratory is:

1. To develop and promote research at the IHU.

2. To develop and promote collaboration among faculty members who have related research interests.

3. The creation of robust and sustainable research hubs.

4. The gathering of experience and expertise.

5. The support of the evaluation processes and quality upgrading of education provided at the Department of Biomedical Sciences, School of Health Sciences, IHU.

The Laboratory's fields of interest are summarized below:

- ✓ Promoting Science on the Discipline subjects of : Embryology, Basic and Systemic Histology, Physiology, Anatomy, Chemistry, Biochemistry, Molecular Biology, Genetics, Biotechnology, Clinical Chemistry, Immunology, Virology, Microbiology, Medical Mycology, Medical Parasitology, Medical Cytology, Medical Histopathology, Haematology.
- ✓ Supporting research implementation in order to fulfill the Department's research demands.
- ✓ Supporting research implementation in order to fulfill the educational demands of the following disciplines: embryology, basic and systematic histology, physiology, anatomy, anatomy, chemistry, biochemistry, molecular biology, genetics, biotechnology, Clinical Chemistry, Immunology, Immunology, Virology, Microbiology, Medical Mycology, Medical Mycology, Medical Parasitology, Medical Cytology, Medical Histopathology, Haematology of the Department of Biomedical Sciences, School of Health Sciences of the IHU.

- ✓ Dissemination of the knowledge generated, support for undergraduate/postgraduate/doctoral theses and facilitation of internships through cooperation with various institutions.
- ✓ Promoting cooperation with other academic institutions and research centers in Greece and abroad, which have corresponding or complementary interests.
- ✓ Promoting cooperation with public organizations or private companies for the implementation of the research outcomes, in collaboration with the Research Committee and the IHU Special Account for Research.
- ✓ Publishing the results and progress of the research activities in National and International Conferences and in peer reviewed scientific journals.

8. THE UNDERGRADUATE STUDY PROGRAM

PRESENTATION OF THE UNDERGRADUATE STUDIES PROGRAM

The Undergraduate Studies Program of the Department of Biomedical Sciences, summary tables with duration, courses, course classification (compulsory, core, general background, elective, specialty), hours of theory, practical exercises (tutorials), laboratories, credit units, ECTS, is presented below:

Table I. Summary of the Undergraduate Study Program of the Department of Biological Sciences

Semester							
1st	2nd	3rd	4th	5th	6th	7th	8th
Biology-Molecular Biology (CC)	Biochemistry II Macromolecules Metabolism - Disorders) (CC)	Bioethics (CC)	Human Physiology (CC)	Medical Biotechnology (CC)	Medical Virology (CC)	Immunology II (CC)	Molecular Diagnostics (CE)
Chemistry (CC)	Human Genetics (CC)	Applications of Informatics in Biomedical Sciences (CC)	Medical Microbiology I (Identification of Bacteria) (CC)	Medical Microbiology II (CC)	Immunology I (CC)	Clinical Chemistry IV (Laboratory Endocrinology and Special Biochemical Tests) (CC)	Preventive Medicine (CE)
Laboratory animals (CC)	General Microbiology (CC)	English Medical Terminology (CC)	Clinical Chemistry I (Urine and body fluid analyses) (CC)	Clinical Chemistry II (Diagnostic Enzymology - Clinical Biochemistry of Electrolytes) (CC))	Clinical Biochemistry of Metabolic and Degenerative Diseases (Clinical Chemistry III) (CC)	Medical Parasitology (CC)	Mechanisms and biochemical markers of ageing-disease and chronic diseases (CE)
Health and Laboratory Safety in Biomedical Sciences - First Aid (CC)	Human Anatomy (CC)	Blood Drawing Techniques (CC)	Hemopoiesis - Blood Physiology (Hematology I) (CC)	Anemias - Blood Transfusion (Hematology II) (CC)	Hematological Malignancies - Hemostasis (Hematology III) (CC)	Hygiene (CC)	Human microbiome (CE)
Biochemistry I (Structure & Function of Biomolecules) (CC)	Nuclear Medicine Physics (CC)	Nutrient Substrates (CC)	Biostatistics (CC)	Medical Cytology (CC)	Medical Mycology (CC)	Clinical Microbiology (CE)	Forensic Science: Forensic Laboratory Techniques

							(CE)
Basic Histology and Methods of Study - General Embryology (CC)		Professional Ethics / Employment rights (CC)	Research Design (CC)		Laboratory Medical Cytology (CC)	Pharmacology-Toxicology (CE)	Diploma Thesis (Bachelor's Thesis) * (EC)
		General Pathology (CC)	Systemic Pathology (CC)		Practical Training, I, (2months) (OC)	Quality control / Organization in Diagnostic Laboratories (CE)	Practical Training II / Clinical-Laboratory Training (5 months) (CC)
						*Diploma Thesis (Bachelor's degree) (CE)	

Compulsory Courses (CC)	**Compulsory Elective courses (CE)**	**Optional courses (OC)**	**Total Courses**
41	**9**	**1**	**51**

General background Course :GBC
Special background Course: SBC
Specialty Course:SC
General knowledge Course: GKC

CC: Compulsory, CE: Compulsory elective, OC: optional

Table II. The Undergraduate Study Program of the Department of Biological Sciences per Semester

1st Semester

No	COURSE CODE	Course	Course Type	TH	TU	L	Hours / week	WL	ECTS
1	285-1901011(TH) 285-1901012(L)	Biology-Molecular Biology	GBC (CC)	3		2	5	210	7
2	285-1901021(TH) 285-1901022(L)	Chemistry	GBC (CC)	3		2	5	180	6
3	285-190103	Laboratory animals	SBC (CC)	2			2	60	2
4	285-190104	Health and Laboratory Safety in Biomedical Sciences - First Aid	GKC (CC)	2			2	90	3
5	285-1901051(TH) 285-1901052(L)	Biochemistry I (Structure & Function of Biomolecules)	GBC (CC)	3	1	1	5	210	7
6	285-1901061(TH) 285-1901062(L)	Basic Histology & Study Methods - General Embryology	SBC (CC)	2	1		3	150	5

ANNOTATIONS
TH: Hours of Theory,
TU: Tutorial / Practical Exercises,
L: Laboratory Exercise
WL: Workload for the whole academic semester

GBC: General Background Course
SBC: Special Background Course
SC: Specialty Course
GKC: General Knowledge Course

CC: Compulsory course
CE: Compulsory Elective Course
OC: Optional Course

ECTS: Credit Units (equal to European ECTS credit)

2nd Semester

No	COURSE CODE	Course	Course Type	TH	TU	L	Hours / week	WL	ECTS
1	285-1902011(TH) 285-1902012(L)	Biochemistry II (Biomolecules Metabolism - Metabolism Disorders)	GBC (CC)	3	1	2	6	210	7
2	285-1902021(TH) 285-1902022(L)	Human Genetics	SBC (CC)	3	1	2	6	210	7
3	285-1902031(TH) 285-1902032(L)	General Microbiology	SBC (CC	3	1	2	6	210	7
4	285-190204	Human Anatomy	GBC (CC)	3			3	150	5
5	285-190205	Nuclear Medicine Physics	GBC (CC	2			2	120	4

3rd Semester

No	COURSE CODE	Course	Course Type	TH	TU	L	Hours / week	WL	ECTS
1	285-190301	Bioethics	GKC (CC)	2			2	60	2
2	285-190302	Applications of Informatics in Biomedical Sciences	GKC (CC)	4			4	120	4
3	285190303	English Medical Terminology	GBC (CC)	2			2	120	4
4	285190304	Blood Drawing Techniques	SBC (CC)			3	3	120	4
5	285-1903051(TH) 285-1903052(L)	Nutrient Substrates	SBC (CC)	3	1	1	5	210	7
6	285-190306	Professional Ethics / Employment Rights	GKC (CC)	2			2	60	2
7	285-1903071(TH) 285-1903072(L)	General Pathology	SC (CC)	3	1	2	6	210	7

4th Semester

No	COURSE CODE	Course	Course Type	TH	TU	L	Hours / week	WL	ECTS
1	285-190401	Human Physiology	GBC (CC)	3			3	90	3
2	285-1904021(TH) 285-1904022(L)	Medical Microbiology I (Identification of Bacteria)	SC (CC)	3	1	2	6	180	6
3	285-1904031(TH) 285-1904032(L)	Clinical Chemistry I (Urine and body fluid analyses)	SC (CC)	3		2	5	150	5
4	285-1904041 (TH) 285-1904042 (L)	Hemopoiesis – Blood Physiology (Hematology I)	SC (CC)	3		2	5	180	6
5	285-1904051 (TH) 285-1904052 (L)	Biostatistics	SBC (CC)	1	1		2	60	2
6	285-190406	Research design	GBC (CC)	2			2	60	2
7	285-1904071 (TH) 285-1904072 (L)	Systemic Pathology	SC (CC)	3	1	2	6	180	6

5th Semester

No	COURSE CODE	Course	Course Type	TH	TU	L	Hours / week	WL	ECTS
1	285-1905011 (TH) 285-1905012 (L)	Medical Biotechnology	SC (CC)	3	1	2	6	210	7
2	285-1905021 (TH) 285-1905022 (L)	Medical Microbiology II (Cultures of biological-body fluids and secretions - food - water)	SC (CC)	3	1	2	6	210	7
3	285-1905031 (TH) 285-1905032 (L)	Clinical Chemistry II - (Diagnostic Enzymology - Clinical Biochemistry of Electrolytes)	SC (CC)	2		2	4	180	6
4	285-1905041 (TH) 285-1905042 (L)	Hematology II – (Anemias - Blood Transfusion)	SC (CC)	3		2	5	180	6
5	285-190505	Medical Cytology	SC (CC)	3			3	120	4

6th Semester

No	COURSE CODE	Course	Course Type	TH	TU	L	Hours / week	WL	ECTS
1	285-1906011 (TH) 285-1906012 (L)	Medical Virology	SC (CC)	3	1	2	6	180	6
2	285-1906021 (TH) 285-1906022 (L)	Immunology I	SC (CC)	3		2	5	150	5
3	285-1906031 (TH) 285-1906032 (L)	Clinical Biochemistry of Metabolic and Degenerative Diseases (Clinical Chemistry III)	SC (CC)	3		2	5	150	5
4	285-1906041 (TH) 285-1906042 (L)	Hematological Malignancies - Hemostasis (Hematology III)	SC (CC)	3		2	5	180	6
5	285-1906051 (TH) 285-1906052 (L)	Medical Mycology	SC (CC)	2		2	4	150	5
6	285-190606	Laboratory Medical Cytology	SC (CC)			2	2	90	3
7		Practical Training, I/Clinical-Laboratory Training: 320 hours after the end of 6th semester (8 hours x 5 days x 8 weeks = 320 hours =2months, during the summer months or equivalent) *	SC (OC)				40	320	15

*** According to the Internal Regulations of the I.H.U., the Work Load (WL) and ECTS of Optional Courses are not added to the WL and ECTS of the semester, nor to the total ECTS required for the degree and their grade does not contribute to the final grade of the degree. However, optional courses, their grade and ECTS are included in the transcript of records and the diploma supplement.**

7th Semester (*All Compulsory Courses and 2 Compulsory Elective Courses shall be registered*)

No	COURSE CODE	Course	Course Type	TH	TU	L	Hours / week	WL	ECTS
1	285-1907011 (TH) 285-1907012 (L)	Immunology II	SC (CC)	3		2	5	180	6
2	285-1907021 (TH) 285-1907022 (L)	Clinical Chemistry IV (Laboratory Endocrinology and Special Biochemical Tests)	SC (CC)	3	1	2	6	150	6
3	285-1907031 (TH) 285-1907032 (L)	Medical Parasitology	SC (CC)	2	1	2	5	180	6
4	285-190704	Hygiene	SC (CC)	2			2	60	2
5	285-190705	Clinical Microbiology	SC (CE)	2			2	150	5
6	285-190706	Pharmacology-Toxicology	SC (CE)	2			2	150	5
7	285-190707	Quality control / Organization in Diagnostic Laboratories	SC (CE)	2			2	150	5
8		*Diploma Thesis (Bachelor's degree)	SC (CE)					150	5

*** The Diploma Thesis is a two-semester project and students who select this option must register for it also in the 8th semester.**

8th Semester (*Mandatory Practical Training and 2 compulsory elective courses shall be registered*)

No	COURSE CODE	Course	Course Type	TH	TU	L	Hours / week	WL	ECTS
1	285-190801	Molecular Diagnostics	SC (CE)	2			2	150	5
2	285-190802	Preventive Medicine	SC (CE)	2			2	150	5
3	285-190803	Mechanisms and biochemical markers of aging-disease and chronic diseases	SC (CE)	2			2	150	5
4	285-190804	Human Microbiome	SC (CE)	2			2	150	5
5	285-190805	Forensic Science: Forensic Laboratory Techniques	SC (CE)	2			2	150	5
6		Diploma Thesis (Bachelor's Thesis) *	SC (CE)					150	5
7		Practical Exercise II / Clinical-Laboratory Training (5 months)	SC (CC)				30	600	20

*** The Diploma Thesis is a two-semester project and students who select this option must also register for it in the 8th semester.**

9. POSTGRADUATE STUDY PROGRAMS IN THE DEPARTMENT

Five Postgraduate Study Programs, three in Greek and two in English, are currently offered at the Department of Biological Sciences, School of Health Sciences.

1 & 2) "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases", in co-organization with the Department of Medicine of the Democritus University of Thrace, (in Greek and English).

3) "Vaccines and Infectious Diseases", in co-organization with the Department of Medicine of Aristotle University, (in Greek).

4) "Applied Gerontology and Geriatrics", in co-organization with the Department of Medicine of Aristotle University, (in Greek).

5) "Biomedical advances in the diagnosis of infectious disease", (in English), (in process of being formally published in the Government Gazette)

Postgraduate study program in"Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" (in Greek)

The MSc "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" (in Greek) (Government Gazette 4403, 06/10/2020), is co-organized with the Department of Medicine of the Democritus University of Thrace.

The MSc "Biomedical and Molecular Sciences - Diagnosis and Treatment of human diseases" (in English) (Government Gazette 3241, 24/06/2022), is co-organized with the Department of Medicine of the Democritus University of Thrace.

9.1.1 History

The MSc "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" was approved for the first time during the academic year 2014-2015 (Government Gazette approval no.3353 /12-12-2014) in co-organization with the Department of Medicine of the D.U.Th. After the renaming of the Department of Medical Laboratories to the Department of Biomedical Sciences, I.H.U., it was reestablished by the Government Gazette 4403, 06/10/2020.

In 2022 the English version of the Postgraduate Study Program was approved, (Government Gazette 3241, 24/06/2022)

9.1.2 Goals and Objectives of the Postgraduate study program

The objective of the MSc "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" is the postgraduate education, research, training and qualification of new scientists and researches in Biomedical and Molecular Sciences and their applications in the diagnosis and treatment of diseases through the acquisition of knowledge and skills in basic and applied laboratory and clinical research.

The postgraduate studies program is part of the strategic planning of the Democritus University of Thrace and the IHU, is governed by scientific coherence and aims at further promotion of knowledge, development of research and technologies, fulfillment of the educational, research, social, cultural and developmental needs of the country, high-level specialization of graduates in theoretical and applied areas of specific disciplines, specific subject areas or individual branches of the Departments' first cycle of studies.
Furthermore, the aim of the MSc is to provide students with a comprehensive overview of the applications of biomedical and molecular sciences and to interconnect their professional training with the employment opportunities available.

9.1.3 The postgraduate degree awarded

The MSc awards a single Diploma of Postgraduate Studies (MSc) in "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" without specializations.

9.1.4 Admissions

Eligible to apply for the MSc program are graduates of the Departments of: Medicine, Biomedical Sciences, Dentistry, Pharmacy, Biology, Nursing, Medical Laboratories, Veterinary Medicine, Biochemistry, Biotechnology, Molecular Biology, Agriculture, Geology, Geology, Chemistry, Physics, Mathematics, Engineering, Engineering, Engineering Schools, Economics and Management Sciences are admitted, also graduates of Computer Science, Social and Humanitarian Studies, Physical Education, Nutrition, Aesthetics-Cosmetology and other Departments of Universities of the national territory and of recognized similar foreign institutions, as well as graduates of the Departments of T.E.I. and Military Schools of relevant disciplines.
Moreover, graduates of other University Departments or other Higher Education Institutions can also be admitted, following a decision of the Special Interdisciplinary Committee (SIC), provided that their thesis, which will be prepared in the above mentioned MSc, is absolutely relevant to their degree. The attendance of additional courses may be deemed necessary for graduates of Departments with a lesser relevance of the subject matter, following a decision of the Special Interdisciplinary Committee.

9.1.5 Duration of studies

The MSc program lasts for four semesters.
A total of 120 credits (ECTS) are required for the award of the present MSc.
For obtaining the degree, compulsory attendance and successful examination is required in all courses distributed in the first two semesters of study (A and B) (30 ECTS respectively), all of which are compulsory. During the third semester of studies, the practical training (30 ECTS) is carried out, while during the fourth (D) semester of studies, the successful completion and preparation of the postgraduate thesis is required, the number of credits (ECTS) of which is set at 30.

9.1.6 Course schedule per semester

1st SEMESTER: BIOMEDICAL AND MOLECULAR SCIENCES (30 ECTS)
A1 Molecular Biology (Th – L)
A2 Clinical and Molecular Genetics (Th – L)
A3 Clinical and Molecular Cytology (Th)
A4 Clinical and Molecular Biochemistry (Th – L)
A5 Molecular Cytogenetics (Th)
A6 Clinical Chemistry (Th – L)
A7 Molecular and Clinical Pharmacology (Th)

A8 Clinical and Applied Physiology (Th – L)
A9 Genetics of microbes, parasites and fungi - Antimicrobial (Th – L)
A10 Molecular and clinical virology (Th)
A11 Genomics and Proteomics in Prognostic Medicine (Th – L)
A12 Biotechnology and its applications (Th)
A13 Biostatistics - Bioinformatics (Th – L)
A14 Occupational health and safety - Environmental hygiene - Water, air, soil - Mechanisms of mutagenesis - Carcinogenesis (Th – L)
A15 Mass population screening programme for early diagnosis and prevention of pathological conditions. Entry into the labour market - Labour relations (Th)

2ND SEMESTER: HEALTH APPLICATIONS (30 ECTS)
B1 Biomedical applications in health (Th – L)
B2 Molecular pre- and post-natal diagnosis of diseases - Symmetries and Molecular Thermodynamics of biomolecules (Th)
B3 Cell and Tissue Cultures - Nutrients Materials (Th – L)
B4 Biotechnology - DNA - Transgenic animals (Th)
B5 Bioethics in medicine - Cloning etc. (Th)
B6 Gene therapy and its bio-medical applications (Th)
B7 Immunobiology - Immunogenetics and diseases (Th – L)
B8 Oncology - Oncological therapy (Th)
B9 Diagnostic immunohistochemistry (Th – L)
B10 Anatomy - Histology (Th – L)
B11 Epigenetics - Pharmacogenomics (Th)
B12 Biomedical and Molecular Techniques - Related Instrumentation Technology (Th – L)
B13 Creation - use of research patents Development of skills in molecular sciences (Th)
B14 Design and development of a research protocol - International bibliography survey – How to write and publish a Scientific paper (Th – L)

3rd SEMESTER: PRACTICAL EXERCISE (30 ECTS)
C1 Practical training and education:
1) on developmental processes; adaptation to different diagnostic needs (10 ECTS),
2) Quality control (10 ECTS); and
3) on the application of laboratory techniques (10 ECTS)

4th SEMESTER: DEVELOPMENT OF a MSc THESIS (30 ECTS)
D1 Preparation of the Master's thesis

Th= Theory, L= laboratory or clinical exercise

9.1.7 Number of admissions

A maximum of fifty (50) postgraduate students may be admitted per year.

9.1.8 The staff

The staff consists of all faculty members of the Department of Biomedical Sciences of I.H.U. and of Dept. of Medicine of the University of Thrace, faculty members of the Aristotle University of Thessaloniki and of foreign universities.

Postgraduate study program in "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" (in English)

The MSc "Biomedical and Molecular Sciences - Diagnosis and Treatment of human diseases" (in English) (Government Gazette 3241, 24/06/2022), is co-organized with the Department of Medicine of the Democritus University of Thrace.

9.1.9 History

In 2022 the English version of the Postgraduate Study Program "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" was approved, (Government Gazette 3241, 24/06/2022).

9.1.10 Goals and Objectives of the Postgraduate study program

The objective of the MSc "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" is the postgraduate education, research, training and qualification of new scientists and researches in Biomedical and Molecular Sciences and their applications in the diagnosis and treatment of diseases through the acquisition of knowledge and skills in basic and applied laboratory and clinical research.

The postgraduate studies program is part of the strategic planning of the Democritus University of Thrace and the IHU, is governed by scientific coherence and aims at further promotion of knowledge, development of research and technologies, fulfillment of the educational, research, social, cultural and developmental needs of the country, high-level specialization of graduates in theoretical and applied areas of specific disciplines, specific subject areas or individual branches of the first cycle of studies of the Departments.

Furthermore, the aim of the MSc is to provide students with a comprehensive overview of the applications of biomedical and molecular sciences and to interconnect their professional training with the employment opportunities available.

9.1.11 The postgraduate degree awarded

The MSc awards a single Diploma of Postgraduate Studies (MSc) in "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" without specializations.

9.1.12 Admissions

Eligible to apply for the MSc program are graduates of the Departments of: Medicine, Biomedical Sciences, Dentistry, Pharmacy, Biology, Nursing, Medical Laboratories, Veterinary Medicine, Biochemistry, Biotechnology, Molecular Biology, Agriculture, Geology, Geology, Chemistry, Physics, Mathematics, Engineering, Engineering, Engineering Schools, Economics and Management Sciences are admitted, also graduates of Computer Science, Social and Humanitarian Studies, Physical Education, Nutrition, Aesthetics-Cosmetology and other Departments of Universities of the national territory and of recognized similar foreign institutions as well as graduates of the Departments of T.E.I. and Military Schools of relevant disciplines.

Moreover, graduates of other Universities Departments or other Higher Education Institutions can also be admitted, following a decision of the Special Interdisciplinary Committee (SIC), provided that their thesis, which will be prepared in the above mentioned MSc, is absolutely relevant to their degree. The attendance of additional courses may be deemed necessary for graduates of Departments with a lesser relevance of the subject matter, following a decision of the Special Interdisciplinary Committee.

9.1.13 Duration of studies

The MSc program has a duration of four semesters.
A total of 120 credits (ECTS) are required for the award of the present MSc.
For obtaining the degree, compulsory attendance and successful examination is required in all courses distributed in the first two semesters of study (A and B) (30 ECTS respectively), all of which are compulsory. During the third semester of studies, the practical training (30 ECTS) is carried out, while during the fourth (D) semester of studies, the successful completion and preparation of the postgraduate thesis is required, the number of credits (ECTS) of which is set at 30.

9.1.14 Course schedule per semester

1st SEMESTER: BIOMEDICAL AND MOLECULAR SCIENCES (30 ECTS)
A1 Molecular Biology (Th – L)
A2 Clinical and Molecular Genetics (Th – L)
A3 Clinical and Molecular Cytology (Th)
A4 Clinical and Molecular Biochemistry (Th – L)
A5 Molecular Cytogenetics (Th)
A6 Clinical Chemistry (Th – L)
A7 Molecular and Clinical Pharmacology (Th)
A8 Clinical and Applied Physiology (Th – L)
A9 Genetics of microbes, parasites and fungi - Antimicrobial (Th – L)
A10 Molecular and clinical virology (Th)
A11 Genomics and Proteomics in Prognostic Medicine (Th – L)
A12 Biotechnology and its applications (Th)
A13 Biostatistics - Bioinformatics (Th – L)
A14 Occupational health and safety - Environmental hygiene - Water, air, soil - Mechanisms of mutagenesis - Carcinogenesis (Th – L)
A15 Mass population screening programme for early diagnosis and prevention of pathological conditions. Entry into the labour market - Labour relations (Th)

2ND SEMESTER: HEALTH APPLICATIONS (30 ECTS)
B1 Biomedical applications in health (Th – L)
B2 Molecular pre- and post-natal diagnosis of diseases - Symmetries and Molecular Thermodynamics of biomolecules (Th)
B3 Cell and Tissue Cultures - Nutrients Materials (Th – L)
B4 Biotechnology - DNA - Transgenic animals (Th)
B5 Bioethics in medicine - Cloning etc. (Th)
B6 Gene therapy and its bio-medical applications (Th)
B7 Immunobiology - Immunogenetics and diseases (Th – L)
B8 Oncology - Oncological therapy (Th)
B9 Diagnostic immunohistochemistry (Th – L)
B10 Anatomy - Histology (Th – L)
B11 Epigenetics - Pharmacogenomics (Th)
B12 Biomedical and Molecular Techniques - Related Instrumentation Technology (Th – L)
B13 Creation - use of research patents Development of skills in molecular sciences (Th)
B14 Design and development of a research protocol - International bibliography survey – How to write and publish a Scientific paper (Th – L)

3rd SEMESTER: PRACTICAL EXERCISE (30 ECTS)
C1 Practical training and education:
1) on developmental processes; adaptation to different diagnostic needs (10 ECTS),
2) Quality control (10 ECTS); and
3) on the application of laboratory techniques (10 ECTS)

4th SEMESTER: DEVELOPMENT OF a MSc THESIS (30 ECTS)
D1 Preparation of the Master's thesis

Th= Theory, L= laboratory or clinical exercise

9.1.15 Number of admissions

A maximum of fifty (50) postgraduate students may be admitted per year.

9.1.16 The staff

The academic staff consists of all faculty members of the Department of Biomedical Sciences of I.H.U. and of Dept. of Medicine of the University of Thrace, faculty members of the Aristotle University of Thessaloniki and invited ones from foreign universities.

Postgraduate study program in "Vaccines and Infectious Diseases" (in Greek)

9.1.17 History

The Postgraduate Study Program in " Vaccines and Infectious Diseases " (Government Gazette 5193, issue B, 06/10/2022), is co-organized with the Department of Medicine of the Aristotle University of Thessaloniki.

9.1.18 Goals and Objectives of the Postgraduate study program

The objective of the MSc " Vaccines and Infectious Diseases " is the fostering and enhancement of knowledge and research in the scientific fields of vaccines, infectious diseases and the social, ethical, legal and psychological problems that arise in epidemic and pandemic emergencies. In addition, the aim is to supply postgraduate students with specialized knowledge in the above fields, in order to ensure that they are adequately prepared for a successful professional career.
The objectives of the Proposed MSc " Vaccines and Infectious Diseases " are:
The theoretical and applied training of qualified health professionals including: 1) the acquisition of knowledge on the immune response to infectious agents, 2) the acquisition of knowledge on the structure, mode of transmission and pathophysiology of various infectious agents, 3) the acquisition of knowledge on vaccines, their mode of action and the human immune response with emphasis on new technology mRNA vaccines
4) training in strategic and operational planning in relation to health and social care facilities and services in pandemic situations; 5) training in precautionary measures for health

professionals and the general population against infectious causes; 6) training in prevention and response to health emergencies; 7) training in epidemiological surveillance of infectious diseases; and 8) training in research methodology, with emphasis on applied health research. Moreover the MSc aims to encourage interdisciplinary research on vaccination and infectious diseases and on the social, psychological, ethical and legal problems arising in health emergencies (pandemics), and the preparation of high-level postgraduate theses.

9.1.19 The postgraduate degree awarded

The MSc awards a single Diploma of Postgraduate Studies (MSc) in "Vaccines and Infectious Diseases".

9.1.20 Admissions

The programme is open to graduates of University Departments and Departments of Higher Education Institutions (former graduates) of Health Sciences, and more specifically graduates of the Departments of Medicine, Dentistry, Veterinary Medicine, Pharmacy, Biology, Nursing, Biomedical Sciences, Speech Therapy, Occupational Therapy, Physiotherapy and Medical Laboratories.

Also, graduates of departments related to the Health Sciences, such as Social Work, Sociology and Psychology, as well as graduates of related subjects to the above categories, following a reasoned decision by the selection committee.

Candidates for the MSc may also be final year students/graduates of the Departments of Medicine, provided that they have graduated before the the approval of the final list of candidates for admission.

9.1.21 Duration of studies

The minimum duration of study in the Master's program leading to the award of the Diploma of Postgraduate Studies is one full calendar year, including the time for the preparation of the postgraduate thesis.

2. The maximum time allowed for the completion of studies shall be determined by decision of the Postgraduate Studies Programme Committee.

9.1.22 Course schedule per semester

No.	Courses	Teaching hours / semester	ECTS
	1st SEMESTER - COMPULSORY COURSES (face-to-face and distance learning		
A1	Vaccine research, development and clinical studies	25	6ECTS
A2	Vaccines and Vaccination Programs	25	6ECTS
A3	Immunology of infectious diseases; COVID-19	25	6ECTS
A4	Molecular epidemiology - Infection prevention and control / Epidemiological surveillance	25	6ECTS
A5	Research Methodology	25	6ECTS
		Total 125	Total 30
	2nd SEMESTER - COMPULSORY COURSES (face-to-face and distance learning)		
B1	Emerging Diseases - Bioterrorism	25	6ECTS
B2	Clinical and laboratory investigation of infectious diseases / Immunological, microbiological and molecular techniques	25	6ECTS

B3	Vaccine safety and vigilance, pharmacoepidemiology, pharmacovigilance	25	6ECTS
B4	Vaccines and Infectious Diseases:- Public health and health policy issues	25	6ECTS
B5	Psychosocial, bioethical and medico-legal issues in infectious disease management	25	6ECTS
		Total 125	Total 30
	2nd SEMESTER (+ summer period) Preparation of a Master's thesis		15
	TOTAL ECTS		75

9.1.23 Number of admissions

A maximum of forty- five (45) postgraduate students may be admitted per year.

9.1.24 The staff

The academic staff cosists os all faculty members of the Department of Biomedical Sciences of I.H.U. and of Dept. of Medicine of the Aristotle University of Thessaloniki as well as invated ones from foreign universities.

Postgraduate study program in "Applied Gerontology and Geriatrics (in Greek)

9.1.25 History

The Postgraduate Study Program in "Applied Gerontology and Geriatrics" (Government Gazette 5193, issue B, 06/10/2022), is co-organized with the Department of Medicine of the Aristotle University of Thessaloniki.

9.1.26 Goals and Objectives of the Postgraduate study program

The objective of the MSc " Applied Gerontology and Geriatrics " is the provision of specialized and in-depth theoretical knowledge and practical training in necessary clinical skills in the offered field of "applied gerontology with elements of geriatrics".
The aim of the Interdisciplinary Postgraduate Studies Program is to foster and promote knowledge and research in the scientific fields of geriatrics, gerontology, as well as in the emerging social and psychological problems. In addition, the aim is to supply postgraduate students with specialized knowledge about the elderly (chronic diseases, pain, rehabilitation, nutrition, surgical implications, welfare, fragility and care), in order to prepare them for a more thorough understanding of the needs of the elderly, for a successful professional career.

9.1.27 The postgraduate degree awarded

The MSc awards a single Diploma of Postgraduate Studies (MSc) in "Biomedical and Molecular Sciences in the Diagnosis and Treatment of Diseases" without specializations.

9.1.28 Admissions

The programme is open to graduates of University Departments of: Medicine, Biomedical Sciences, Dentistry, Pharmacy, Biology, Nursing, Medical Laboratories, Veterinary Medicine,

Biochemistry, Biotechnology, Molecular Biology, Agriculture, Geology, Geology, Chemistry, Physics, Mathematics, Engineering, Engineering, Engineering Schools, Economics and Management Sciences are admitted, also graduates of Computer Science, Social and Humanitarian Studies, Physical Education, Nutrition, Aesthetics-Cosmetology, and other Departments of Universities of the national territory and of recognized similar foreign institutions, as well as graduates of the TEIs Departments and Military Schools of relevant disciplines.
Moreover, graduates of other Universities Departments or other Higher Education Institutions can also be admitted, following a decision of the Special Interdisciplinary Committee (SIC), provided that their thesis, which will be prepared in the above mentioned MSc, is absolutely relevant to their degree. The attendance of additional courses may be deemed necessary for graduates of Departments with a lesser relevance of the subject matter, following a decision of the Special Interdisciplinary Committee.

9.1.29 Duration of studies

The MSc program lasts for four semesters.
A total of 120 credits (ECTS) are required for the award of the present MSc.
For obtaining the degree, compulsory attendance and successful examination is required in all courses distributed in the first two semesters of study (A and B) (30 ECTS respectively), all of which are compulsory. During the third semester of studies, the practical training (30 ECTS) is carried out, while during the fourth (D) semester of studies, the successful completion and preparation of the postgraduate thesis is required, the number of credits (ECTS) of which is set at 30.

9.1.30 Course schedule per semester

1st SEMESTER: BIOMEDICAL AND MOLECULAR SCIENCES (30 ECTS)
A1 Molecular Biology (Th – L)
A2 Clinical and Molecular Genetics (Th – L)
A3 Clinical and Molecular Cytology (Th)
A4 Clinical and Molecular Biochemistry (Th – L)
A5 Molecular Cytogenetics (Th)
A6 Clinical Chemistry (Th – L)
A7 Molecular and Clinical Pharmacology (Th)
A8 Clinical and Applied Physiology (Th – L)
A9 Genetics of microbes, parasites and fungi - Antimicrobial (Th – L)
A10 Molecular and clinical virology (Th)
A11 Genomics and Proteomics in Prognostic Medicine (Th – L)
A12 Biotechnology and its applications (Th)
A13 Biostatistics - Bioinformatics (Th – L)
A14 Occupational health and safety - Environmental hygiene - Water, air, soil - Mechanisms of mutagenesis - Carcinogenesis (Th – L)
A15 Mass population screening programme for early diagnosis and prevention of pathological conditions. Entry into the labour market - Labour relations (Th)

2ND SEMESTER: HEALTH APPLICATIONS (30 ECTS)
B1 Biomedical applications in health (Th – L)
B2 Molecular pre- and post-natal diagnosis of diseases - Symmetries and Molecular Thermodynamics of biomolecules (Th)

B3 Cell and Tissue Cultures - Nutrients Materials (Th – L)
B4 Biotechnology - DNA - Transgenic animals (Th)
B5 Bioethics in medicine - Cloning etc. (Th)
B6 Gene therapy and its bio-medical applications (Th)
B7 Immunobiology - Immunogenetics and diseases (Th – L)
B8 Oncology - Oncological therapy (Th)
B9 Diagnostic immunohistochemistry (Th – L)
B10 Anatomy - Histology (Th – L)
B11 Epigenetics - Pharmacogenomics (Th)
B12 Biomedical and Molecular Techniques - Related Instrumentation Technology (Th – L)
B13 Creation - use of research patents Development of skills in molecular sciences (Th)
B14 Design and development of a research protocol - International bibliography survey – How to write and publish a Scientific paper (Th – L)

3rd SEMESTER: PRACTICAL EXERCISE (30 ECTS)
C1 Practical training and education:
1) on developmental processes; adaptation to different diagnostic needs (10 ECTS),
2) Quality control (10 ECTS); and
3) on the application of laboratory techniques (10 ECTS)

4th SEMESTER: DEVELOPMENT OF a MSc THESIS (30 ECTS)
D1 Preparation of the Master's thesis

Th= Theory, L= laboratory or clinical exercise

9.1.31 Number of admissions

A maximum of fifty (50) postgraduate students may be admitted per year.

9.1.32 The staff

The academic staff consists of all faculty members of the Department of Biomedical Sciences of the I.H.U. and of Dept. of Medicine of the University of Thrace, faculty members of the Aristotle University of Thessaloniki and invited academic members of foreign universities.

Postgraduate study program in"Biomedical advances in the diagnosis of infectious diseases" (in English)

9.1.33 History

The English-speaking Postgraduate Program (M.Sc.) "Biomedical advances in the diagnosis of infectious diseases", has been approved by the General Assembly of the Department of Biomedical Sciences of the School of Health Sciences of the International Hellenic University (minutes no. 13/2022) and is submitted for approval by the Steering Committee and the Postgraduate Programs Committee of the International Hellenic University (I.H.U.).

9.1.34 Goals and Objectives of the Postgraduate study program

The objective of the MSc is the postgraduate education, research, training and specialization of new scientific workforce in Biomedical and Molecular Sciences and their applications in the diagnosis of infectious diseases, with emphasis on the latest developments and the acquisition of knowledge and skills in both applied laboratory and clinical research.
The aim of the MSc is to provide students with up-to-date and specialized knowledge in the spectrum of biomedical developments in the diagnosis of infectious diseases. Through in-depth theoretical and practical laboratory training, students will be provided with a thorough education in the range of applications of biomedical and molecular sciences.
Furthermore, the aim of the MSc is to provide students with a comprehensive overview of the applications of biomedical and molecular sciences and to interconnect their professional training with the employment opportunities available.

9.1.35 The postgraduate degree awarded

The MSc awards a Postgraduate Diploma of Specialization (M.Sc.) entitled "Biomedical advances in the diagnosis of infectious diseases".

9.1.36 Admissions

Eligible to apply for the MSc program are graduates of the Departments of: of Biomedical Sciences, Medicine, Dentistry, Pharmacy, Biology, Nursing, Medical Laboratories, Veterinary Medicine, Biochemistry, Biotechnology, Molecular Biology, Agriculture, Geology, Geology, Chemistry, Physics are admitted; also graduates of Mathematics, Engineering, Engineering, Technical Faculties, Economics and Management Sciences, Computer Science, Social and Humanities Studies, Physical Education, Nutrition, Aesthetics-Cosmetology and other Departments of Universities of the country, formerly TEIs, and recognized similar institutions abroad as well as foreign graduates of the Departments of Technical Universities and Military Schools of relevant disciplines. Graduates of other Departments of Higher Education Institutions of Higher Education, Technical Universities or other Higher Schools may also be admitted, following a decision of the Steering Committee and the Department's Assembly. Candidates may also be undergraduate students who have successfully completed their undergraduate studies before the end of the registration period and who meet all the requirements for admission to the MS..

9.1.37 Duration of studies

The duration of studies leading to the MSc. degree is three (3) semesters and cannot exceed the maximum of eight (8) semesters.
A total of 90 credits (ECTS) are required for the award of the present MSc.
For obtaining the degree, compulsory attendance and successful examination is required in all courses distributed in the first two semesters of study (A and B) (30 ECTS respectively), all of which are compulsory. During the third semester of studies, the successful completion and

preparation of the postgraduate thesis is required, the number of credits (ECTS) of which is set at 30.

9.1.38 Course schedule per semester

CODE	COURSE TITLE	TYPE OF COURSE	EXAMINATION PERIOD	TYPE OF EXAMINATION	ECTS
A.1	Molecular diagnostics of infection	C, T	February	Written examination	5
A.2	Bioinformatics and study design in infectious diseases	C, T	February	Written examination	5
A.3	Pharmacology- Drug action against pathogens	C, T	February	Written examination	5
A.4	Community acquired infections and public health	C, T	February	Written examination	5
A.5	Infection prevention and control	C, T	February	Written examination	5
A.6	Laboratory Diagnosis of Clinical syndromes and infection	C, T - P	February	Written examination	5
	Sum of ECTS (1st Semester)				**30**
B.1	Investigation and diagnosis of imported infection- tropical diseases	C, T	June	Written examination	5
B.2	Emerging Infectious Diseases	C, T	June	Written examination	5
B.3	Resistance mechanisms in antibacterial	C, T - P	June	Written examination	5
B.4	Advances in neurosciences- Central nervous system infections	C, T	June	Written examination	5
B.5	Infections in hematologic patients	C, T	June	Written examination	5
B.6	How to write a scientific paper	C, T	June	Written examination	5
	Sum of ECTS (2nd Semester)				**30**
C.1	Project-Thesis**			Oral examination	30
	Sum of ECTS (3rd Semester)				**30**
	Total ECTS credits				**90**

C = Compulsory, T = Theoretical, P = Practical course with laboratory or clinical exercises
ECTS: European Credit Transfer System

10. DOCTORAL STUDIES in the DEPARTMENT

Doctorate studies in the Department of Biomedical Sciences were established in 2020 (Government Gazette 3489, 24/08/2020).

The Doctoral Degree is an academic title, which certifies the performance of an original scientific research and the essential contribution of its holder to the advancement of science and knowledge in the Biomedical Sciences discipline. Organized and independent innovative research motivated by the advancement of science through new data, methods and practices are encouraged and supported in the research field.

Eligibility criteria

Those who meet the following requirements are eligible to apply for a PhD thesis at the Department of Biomedical Sciences:

- Graduates of a higher education institutions (University or Technological sector) of Greece or an equivalent institution abroad.
- Holders of a Diploma of Postgraduate Studies from a national university or a recognized as equivalent institution abroad, or holders of a single and indivisible postgraduate degree according to article 46 of Law 4485/2017. In cases where the Bachelor's and Master's degrees are not relevant to the topic of the Doctoral Thesis, the Assembly of the Department may oblige the Doctoral Candidate to attend and to successfully pass one (1) to four (4) courses relevant to the topic of the Doctoral Thesis.
- Those who possess English language proficiency documented by a relevant certificate at least equivalent to the State Certificate of Language Proficiency Level B2 or other supporting documents.

Doctoral Candidates should not be related up to the third degree to a member of the Three-Member Advisory Committee or the Board of the Department or the Seven-Member Examination Committee.

PhD Candidates who do not hold a Diploma of Postgraduate Studies (M.Sc.) will be exceptionally admitted if they are:

a) graduates of 5-year and 6-year departments/schools of a cognitive subject related to the doctoral thesis, in the domestic territory, or equivalent recognized departments/schools abroad.

b) scientists who have significant professional and/or research experience relevant to the subject of the thesis. In these cases, the Assembly of the Department shall justify adequately its decision following a proposal and a detailed memorandum of the Board of the Department, in accordance with the provisions of par. 3 of article 38 of the law. 4485/2017.

In the above cases a) and b), it may be proposed that the candidate attend and successfully pass the examination in courses of Undergraduate or Postgraduate Programs of the Department and/or other Departments, which are defined by the Assembly of the Department after the proposal of the Tripartite Advisory Committee and the Supervisor and are relevant to the topic of the doctoral thesis. The start of the dissertation may be started in parallel with the proposed courses.

Duration

1. The minimum duration for the award of the Doctoral Degree is three (3) full calendar years from the date of the appointment of the Tripartite Advisory Committee.
2. The maximum duration of the Doctoral Dissertation is six (6) full calendar years from the date of appointment of the Tripartite Advisory Committee. The above time may be extended for two (2) additional years, upon request of the candidate and a well-founded decision of the Departmental Assembly.
3. For Doctoral Candidates who are exceptionally admitted without holding a Master's Degree, the minimum time period for obtaining the Doctoral Degree is four (4) full calendar years from the date of the appointment of the Tripartite Advisory Committee.
4. The Assembly of the Department may decide to suspend the Doctoral Candidate's studies for a period of one or two academic semesters, upon his/her request. Permission to suspend studies for a period longer than two academic semesters may be granted if the Doctoral Candidate invokes serious and documented reasons. This period of suspension is not included in the total time spent on the Doctoral Dissertation.
5. A change or specialization of the title may be carried out after a well-founded recommendation of the Tripartite Advisory Committee and approval by the Assembly.

A change of topic in the Doctoral Dissertation under preparation may be carried out after a documented recommendation of the Tripartite Advisory Committee and approval by the Assembly. In the case where the change of topic of the Doctoral Thesis
leads to a new scientific field, the procedure of Article 8 of these Regulations shall be followed from the outset. The time already spent on the previous topic in the P.D.S. is not included in the total time spent on the Doctoral Dissertation.

More information can be found on the Department's website and in the regulations for doctoral studies, Department of Biomedical Sciences

11. SERVICES and STUDENT WELFARE OFFICE

European Programs Office (Erasmus)

The Erasmus+ Programme supports student mobility for:

- **Studies** (Erasmus+ Studies): Encourage students' (undergraduate, postgraduate, doctorate) mobility for the purpose of pursuing part of their curriculum studies by attending courses at other European Universities.
- **Erasmus Traineeship** (Erasmus+ Traineeship / After Placement): Mobility for students' practical training in a European institution (university, research center, company, laboratory, and other organizations) in order to practice and develop their professional skills.

The Erasmus+ Programme supports also the following activities:

- **University staff mobility** for professional training
- **University staff or enterprise staff mobility** for teaching abroad

All courses in the department are taught in the Greek language, with additional English support for foreign students.

Relevant information and the necessary documents for student applications are available on the website of the Erasmus Office of Sindos site at the International Hellenic University (https://www.ihu.gr/, www.ihu.gr/en/academicunits/intprogsen).

At the beginning of each semester, following an announcement on the Department's website, an informative meeting is held on the opportunities and participation process.

More information is provided by the Erasmus Coordinators of the Department of Biomedical Sciences.

Library

The purpose of the library is to enhance the educational process, improve students' qualifications and strengthen the institution's position on the international educational scene.

All students have the opportunity to use the library and its services including:

i. Borrowing books

ii. The possibility of requesting journal articles and borrowing books through the National Network of Scientific and Technological Libraries and from libraries abroad;

iii. ability to search online databases

iv. System of electronic access to educational material posted by each lecturer on the asynchronous education platform, moodle (moodle.teithe.gr), direct communication, participation in discussion groups, etc.

v. Possibility of using electronic mail.

vi. Ability to access foreign language international e-journals free of charge (http://www.heal-link.gr).

vii. Search for articles in Greek journals through the index of Greek journals in the portal http://lib.teithe.gr.

viii. Possibility of on-line information about the library's books and related titles available in other institutions (http://www.lib.teithe.gr).

ix. Institutional repository containing digitized material (Degree Theses, R.P. Publications, Publications of the Institution, Administrative documents, etc.). (http://eureka.lib.teithe.gr)

Also all students have the possibility to use the reading room and the computer facilities of the library.

IHU Library & Information Centre

If you have any questions about Moodle, you can contact us by e-mail: library@the.ihu.gr tel. 2310013123

Student Restaurant

A restaurant is located on the Alexandrian Campus for the catering of students.
All active students of the University are provided with free meals.

Student Dormitory

There are student residences (dormitories) located on the Alexandrian campus. Active students of the University are provided with free accommodation based on the criteria and conditions provided by the Law.

Student Health Care Service

Undergraduate and postgraduate students and doctoral candidates who do not have medical and hospital care from an insurance institution are entitled to full medical and hospital care through the National Health System (NHS) in accordance with the provisions in force at the time.

The European Health Insurance Card (EHIC) for the above categories of students who move to countries of the European Union, as well as the coverage of any expenses that may arise, will continue to be issued by the services of the Institution.

The University Gym

The Sports Centre of the International University of Greece, has the mission to provide a wide range of sports programs and activities for students and staff of the University.

The goal of all programs is the qualitative improvement of the members of the academic community through exercise, game and physical activity. In order to fulfill its objectives, the Sports Centre, while taking into account that it caters to people with different needs and abilities, has created a series of programs that include the following areas:

-Recreational Sports - Organized activities-courses -Tournaments and Sports Days - Competition and sports events - Competitive Sports -Day trips-Nature excursions

The Sports Center of International University of Greece, includes all outdoor and indoor sports facilities, located within the Alexandrian Campus area: Indoor Gymnasium, outdoor basketball courts, outdoor soccer field, and any other sports facilities that may be created on campus in the future.

Sports and Cultural Activities

The International Hellenic University encourages actions and activities of all members of the community in the fields of sport and culture. In this context, relevant committees are set up for this purpose by decisions of the competent bodies.
The Foundation provides infrastructure and resources for relevant activities, events, conferences and international exchanges, the main beneficiaries of which are students and other members of the university community.
community. More specific arrangements and procedures shall be laid down by decisions of the competent bodies.

In particular, in the Alexandrian Campus of Sindos, where the Department of Biomedical Sciences is located, there are two auditoriums and two conference rooms suitable for lectures available for this purpose whenever needed.
In addition, a modern Gymnasium has been built which can host a variety of events.

Network Operations Center (NOC)– Electronic Services

Network Management Center

The Network Management Center of the Alexandrian Campus of the I.H.U. in Sindos, Thessaloniki, Greece, designs and develops the network and telecommunications infrastructure of the campus, providing high quality services to the members of the institution.

It is responsible for:

- The exclusive care for the installation, management and maintenance of the data, backbone and distribution network devices and the extension of their cable infrastructure.
- The exclusive care for the installation, management and maintenance of the voice (VoIP) network of the Alexandria Campus.
- The sole responsibility for the installation, management and maintenance of any extension of the data network, wired or wireless, within and outside the Alexandria Campus facilities and the management and maintenance of the data network interface with the Internet and with any other non-institutional data network.
- Supervision of the access networks of the organizational units.
- The management of all third level logical addresses (IP addresses), private and public.
- The policy of routing third level packets (IP packets) within the autonomous system and routing in cooperation with the National Research and Technology Network for the proper interconnection of the Foundation with the Internet.
- The service of firewalls at the boundaries of the autonomous system in order to safeguard the functionality of the computer systems and the quality of the services offered.
- The addressing and naming service for the computer systems connected to the data network.
- The management of the central mail relay and routing service, enhanced with services to protect servers and users against malicious users.
- The creation and maintenance of personal electronic mailboxes for all members of the academic community, teaching staff, administrative staff and students, with support for

their management from personal computers via POP3S, IMAPS protocols, as well as via the webmail roaming service.

- The creation and management of e-mail lists for groups of users.
- The creation, maintenance and management of a centralized anti-malware/antispam control mechanism.
- The creation and management of personal storage space for each member of the academic community, teaching staff, administrative staff and students.
- The creation and maintenance of backups of the systems supporting the services offered on long term storage media, for example optical media (DVD), NAS, magnetic tapes, or other suitable media.
- The management of the central Alexandria Campus website and the hosting of websites for the institutional units of the Foundation such as Faculties, Departments, Services as well as the hosting of individual user websites.
- The directory service (directory services) and its interface with the directory service of the National Research and Technology Network.
- The multi-level security services, including the physical layer and from the network level to the application level (use of secure protocols, encrypted transmission of personal data).
- The web proxy/cache service.
- The computer time synchronization service.
- The development of advanced network services and their integration into the full-scale data network environment.
- Training of the academic community and transfer of know-how to the individual organizational units on network services and infrastructure issues.
- Providing support to users of the data network in terms of the services offered (User Help Desk, Help Desk).
- Responsibility for recommending the operating rules of the data network to the relevant bodies of the Alexandria Campus.
- Continuous redesign and upgrading of the data network in line with technological developments.

12. INTERNATIONAL DIMENSION and PARTNERSHIPS

The Department of Biomedical Sciences strongly emphasizes both the international perspective of studies as well as the research activities.

Each year a number of students of the Department attend courses or undertake research internships in several foreign universities.
Likewise, students from foreign universities attend courses at the Department of Biomedical Sciences.
Academics from foreign Universities regularly contribute to the postgraduate programs of the Department.

In the research field, professors of the Department collaborate with professors from Universities abroad as evidenced by joint publications of papers in International Scientific Journals.
The Department emphasizes the dissemination of its academic members' research findings and results, at International conferences and strongly encourages its students to participate both in the research work and in the conferences where the results are presented.
Recently, the Department has awarded an Emeritus Doctorate of the Department to Professor and Associate of the Department, Prof. Trevor Jones, King's College.

13. REFERENCE to the DEPARTMENT and UNIVERSITY REGULATIONS

The hyperlinks to the Department's and the University's various operating regulations (regulations of studies, examinations, degree, operation, ethics, ...), are listed below.

International Hellenic University

The International Hellenic University Regulation (in Greek)

Hellenic Authority for Higher Education (in English)

Ethics and Research Code of IHU (in Greek)

Library & Information Centre of IHU (in English)

Academic Advisor Regulation (in Greek)

Student Dorms Regulation of Operation (in Greek)

European and International Programs (in English)

Erasmus+ (in English)

Department of Biomedical Sciences, IHU

Establishment of the Research Laboratory of the Department of Biomedical Sciences (in GreeK)

Diploma thesis regulation of the Department of Biomedical Sciences (in Greek)

Professional rights of the Graduates of the Department of Biomedical Sciences (in Greek)

MSc Programs links (in Greek)

MSc in Biomedical & Molecular Sciences in Diagnosis and Treatment of Diseases (in English)

Online Textbooks Service (Eudoxus) (in Greek)

14. APPENDIX: DETAILED COURSES OUTLINE

In the following, detailed descriptions of the courses per Semester and Direction of Studies are given, according to the standard of the Hellenic Authority for Higher Education (HAHE).

The course outlines are presented in accordance with the HAHE standard.
Hellenic Authority for Higher Education

1st Semester Courses

1.1. 1st Semester Courses

Biology – Molecular Biology
COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1901011 285-1901012	**SEMESTER**	**1rst**
COURSE TITLE	**Biology – Molecular Biology**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	3	4
Laboratory	2	3
Total	5	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Compulsory, General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=17 https://moodle.teithe.gr/enrol/index.php?id=3605 https://exams-phym.the.ihu.gr/course/view.php?id=19 https://moodle.teithe.gr/enrol/index.php?id=3606,

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*

- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The aim of the course is to provide students with the basic knowledge of the composition, structure and function of the cell (mainly eukaryotic) and cell division, as well as to understand the mechanisms underlying the central doctrine of Molecular Biology. The course also aims to acquire skills in the techniques of staining and microscopic observation of cell preparations, in determining the number of cells in microscopic preparations, and in determining the concentration of nucleic acids.
Upon completion of the course, students are expected to have acquired:

1. Knowledge

- Recognize the biodiversity of living organisms and their evolution.
- Distinguish the properties of different living organisms (prokaryotes, eukaryotes, viruses) in terms of their organization, structure, function and genetics.
- Identify the chemical composition of biological macromolecules (nucleic acids, proteins, lipids, polysaccharides) and their participation in the structure and organization of the cell (prokaryotic-eukaryotic).
- Understand the energy flow in biological systems and the basic principles of metabolism (glucose synthesis and oxidation, enzymes - biocatalysis)
- Distinguish and describe the organization, function and role of the various cellular structures of the eukaryotic cell (nucleus, cell membrane, cytoplasmic structures and organelles).
- To be able to understand and describe the basic principles governing the flow of genetic information (DNA replication-transcription-translation-expression).
- Identify the role of cell division and apoptosis in the maintenance and evolution of life and genetic information.

2. Skills

- Recognize the associated terminology and abbreviations used worldwide in microscopic observation examinations.
- Know the basic principles and techniques of microscopy
- Understand the basic principles and apply techniques for staining and observing cell preparations (eukaryotic-prokaryotic) using an optical microscope.
- Apply techniques to determine the concentration of nucleic acids.
- Calculate the number of cells (prokaryotic-eukaryotic) in microscopic preparations.

3. Competence

- Be able to successfully and safely operate the optical microscope
- Be familiar with the basic practices, equipment and rules of operation and safety of a molecular biology laboratory
- Be familiar with the proper handling and maintenance of biological and pathological materials
- Develop critical thinking and the ability to identify and solve problems, working alone or in groups.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*

Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

(3) SYLLABUS

THEORY

- Principles of cellular organization (the diversity of life, prokaryotic-eukaryotic cell, viruses, cell analysis technology)
- Principles of Molecular organization (the nature of biomolecules, macromolecules and the human genome, formation of cell structures and organelles) Plasma Membrane (Cell Membrane)
- Nucleus & chromosome organization
- DNA: replication and repair – Expression and regulation of Genetic information
- Cytoplasmic membrane system
- Self-replicating cytoplasmic organelles
- Cytoskeleton – cellular movements
- Cell growth: Division and Apoptosis
- Cellular interactions

LABORATORY

Introduction to cell biology. Biology-Molecular Biology Laboratory equipment. Basic Principles of Laboratory Safety and proper use of laboratory equipment. Introduction to microscopy methods. Microscopic observation of living eukaryotic cells and cellular structures (observation of plant cell nuclei, observation of amyloid granules after Lugol's staining, observation of leaf stomata - guard cells - chloroplasts, observation of animal cell nuclei). Microscopic examination of bacterial fresh preparation. Staining techniques of prokaryotic cell preparations. Gram staining procedure (rapid) and observation of Gram (-) and Gram (+) bacterial preparations. Lactophenol staining and observation of fungal preparations. Cell counting techniques (eukaryotic-prokaryotic). Cell culture techniques. DNA quantification on agarose gels. Central Dogma Biology exercises methodology (replication-transcription-translation-translation).

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face. The laboratory is held at the Molecular Biology-Genetics

<table>
<tr><td></td><td>& Medical Biotechnology Laboratory</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Basic software (windows, word, power point, the web, etc.).
• Support of learning process through the electronic platform / e-class
• Problem solving methodology is uploaded and accessible by students as pdf files in e-class.
• Instructions for writing assignments (Theory and Laboratory) are uploaded and accessible by students as pdf files in e-class.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>120</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Laboratory</td><td>90</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>210</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Theory

1. Written final exam may include:
- Multiple Choice questionnaire
- Short answer questions
- Matching questions
- True-false questions with justification
- Problem solving

Laboratory
1. Daily assessment of students with theory and hands-on exercises in the laboratory (not graded).
2. Written final examination may include:
Multiple Choice Test.
Short answer questions
Matching questions
True-false questions with justification
Problem solving

Total course grade: Theory grade 60% + Laboratory Grade 40%

For Erasmus students who may have selected the course, an assignment is given in the course subject area, which will be presented and examined in English.</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

A. Greek

- Alberts B., Bray D., Hopkin K., Johnson A., Lewis J., Raff M., Roberts K., Walter P. "Albert's Essential Cell Biology, 5th edition" («Βασικές Αρχές Κυτταρικής Βιολογίας»), Copyright © 2021 - BROKEN HILL PUBLISHERS LTD, Ανατύπωση 5ης έκδοσης 2021. Κωδικός βιβλίου στον Εύδοξο: 102069992.

- Geoffrey M. Cooper & Robert E. Hausman. ΤΟ ΚΥΤΤΑΡΟ: Μια Μοριακή Προσέγγιση ΕΠΙΤΟΜΗ ΕΚΔΟΣΗ. ΑΚΑΔΗΜΑΪΚΕΣ ΕΚΔΟΣΕΙΣ Ι. ΜΠΑΣΔΡΑ & ΣΙΑ Ο.Ε., 2021, 8η έκδοση. Κωδικός βιβλίου στον Εύδοξο: 102123643.

1st Semester Courses

Chemistry
COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1901021 285-1901022	**SEMESTER**	**1st**
COURSE TITLE	Chemistry		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Theory (Lectures)	3	4
Laboratory	2	2
	5	6
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail in (d).		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	General background Course, Compulsory Course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competencies of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for Writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To recognize and understand chemical formulas
- To understand chemical reactions
- To understand buffer and pH concept
- To apply their knowledge to the diagnostic tests in the following courses
- To understand organic compounds and the phenomenon of isomeria
- To recognize the relevant nomenclature and the internationally used names of the compounds
- to characterize organic compounds according to their characteristic groups
- to understand the basic principles of separation methods, qualitative and quantitative determination of inorganic and organic compounds (eg extraction - IR spectrometry, NMR, flame photometry)

2. Skills

The students will learn

- Different separation techniques of substances
- The preparation of solutions and buffer solutions
- Carrying out detection and identification reactions of substances and biomolecules to isolate a substance
- The possibility of naming an organic compound
- The ability to perform organic reactions
- The use of various utensils and instruments in a biochemical laboratory

3. Competence

The purpose of the course is

- to familiarize students with chemical compounds, their structure, biomolecules,
- the preparation of solutions,
- to evaluate chemical reactions,
- to analyze chemical constants
- to be able to use utensils and instruments in the laboratory
- to present the techniques of separation and determination of substances.

General Competences

Taking into consideration the general competencies that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analyses and synthesize data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Teamwork	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

3) SYLLABUS

Theory

Chemistry Elements: Modern atomic theory, Atomic structure, Periodic Table, mixtures, solutions, colloids. Chemical bonds. Chemical Reactions. Chemical Kinetics, Stoichiometry. Oxidation and reduction. Electrolytes. Bioenergetics,

Thermodynamics, Chemical and ionic balance. pH, Hydrolysis of salts, buffers. Solutions – Solubility Complexes Hybridization Theory.
Elements of Organic Chemistry. Isomeria in organic compounds. Homologous series. General reactions of the characteristic groups. Nomenclature of organic compounds.
Main characteristics of certain classes of organic compounds:
Saturated and unsaturated organic compounds. Cyclic and aromatic compounds, Alcohols-phenols, carbonyl compounds, Acids, amines, esters, ethers.
Laboratory
Laboratory techniques are carried out in a laboratory.
Introduction to Chemistry. Chemistry Laboratory Equipment, Principles of Laboratory Safety, Methods used to separate substances. Extraction. Centrifugation. Inorganic metal detection reactions. Halogen detection. Identification of chemical compounds and elements. Preparation of solutions. Preparation of buffer solutions. Determination of pH. Flame photometry. Atomic Absorption, Infrared (IR), Nuclear Magnetic Resonance (NMR) spectrometry. Mass spectroscopy

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In the classroom, face to face.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, and communication with students</td><td>Basic software (windows, word, PowerPoint, the web, etc.).
Support of the learning process through the electronic platform / e-class</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>120</td></tr>
<tr><td>Laboratory (practice works)</td><td>60</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>180</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem-solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Theory

1. Written final exam may include:
- Multiple Choice Questionnaire
- Short answer questions

2. Written Assignment, optional, with an oral presentation in class (Graded and gives 10% to the final grade of the final theory exam).
Note: (2) is carried out as long as the circumstances allow it, such as the number of students, the workload of professors, and other factors.</td></tr>
</table>

5) ATTACHED BIBLIOGRAPHY

- Χημεία – Εισαγωγικές Έννοιες, Λυμπεράκη Ευγενία, Εκδόσεις Αλτιντζη, 2009 (προτεινόμενο διδακτικό σύγγραμμα για τη θεωρία)
- Χημεία – Εργαστηριακές ασκήσεις, Λυμπεράκη Ευγενία

- McMurrayJohn ΟΡΓΑΝΙΚΗ ΧΗΜΕΙΑ (Ελληνική Έκδοση). Πανεπιστημιακές εκδόσεις Κρήτης, 2012.
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- Armstrong, James (2012). General, Organic, and Biochemistry: An Applied Approach. Brooks/Cole.
- Hill, J.W.; Petrucci, R.H.; McCreary, T.W.; Perry, S.S. (2005). General Chemistry (4th ed.). Upper Saddle River, New Jersey: Pearson Prentice Hall.

1.3. 1st Semester Courses

LABORATORY ANIMALS

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190103	SEMESTER	1ST
COURSE TITLE	**LABORATORY ANIMALS**		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		WEEKLY TEACHING HOURS	CREDITS
Theory		2	2
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE general background, special background, specialised general knowledge, skills development	Special Background Course, Compulsory Course		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS			
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3611 http://www.mls.teithe.gr		

2) LEARNING OUTCOMES

Learning outcomes The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described. Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, the student is expected to:

1. Knowledge

- Get to know zoonotic diseases.
- Get to know the diagnostic methods used in the diagnosis of experimental animal diseases with an emphasis on new technologies.
- Recognize relevant terminology and internationally used abbreviations in laboratory animal diseases and husbandry techniques.
- Understand the EU and Greek legislation for the protection of laboratory animals used for experimental and other purposes,

2. Skills

- Carry out capture, containment and blood sampling of the animal in an experimental laboratory.
- Be able to identify and apply appropriate methods for experimental treatment, such as administration of analgesia or anaesthesia, surgery including perioperative care, and euthanasia.
- Apply the principles of protection to the laboratory personnel, experimental animals and the environment.
- Understand in order to apply the methods of reproduction, breeding, etc. to the various laboratory animals.

3. Competence

- Design an experimental protocol.
- Be able to appropriately select animal species, where needed for new research activities.
- Ability to generate new research ideas and collaborate with team members.
- Decision making

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working independently
Team work
Working in an interdisciplinary environment
Production of new research ideas
Production of free, creative and inductive thinking

3) SYLLABUS

1. Experimental animal facilities (special living facilities, sterilization, disinfection),
2. Anesthesia of laboratory animals, pain management
3. Anatomy, physiology, and diseases of laboratory animals (mouse, rat, rabbit, guinea pig, dog)
4. Administration of substances
5. Euthanasia of experimental animals,
6. Zoonotic diseases
7. Diseases of laboratory animals identification and application of appropriate methods for experimental treatment (proper animal handling and restraint, methods of blood sampling)
8. information regarding the biology and breeding of laboratory animals
9. Ethics (the 3 R's)
10. EU and Greek Legislation for the protection of laboratory animals used for experimental and other purposes.

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In the classroom, face to face.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Basic software (windows, word, power point, the web, etc.).
Use of the moodle e-learning platoform in order to upload scientific articles, instructions, lectures, useful links, video handling of laboratory animals, questionnaires, information for attending conferences and seminars related to the course, etc.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td><table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>60</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria</td><td>Written final exam may include:
- Multiple Choice questionnaire
- Short answer questions</td></tr>
</table>

are given, and if and where they are accessible to students.	

5) RECOMMENDED LITERATURE

(1) Βιβλίο [127429]: ΑΡΧΕΣ ΔΙΑΧΕΙΡΙΣΗΣ ΖΩΩΝ ΕΡΓΑΣΤΗΡΙΟΥ, ΠΕΤΡΟΣ ΥΨΗΛΑΝΤΗΣ
(2) Βιβλίο [2946]: Εγχειρίδιο Μελέτης Ζώων Εργαστηρίου, Παν. Σούμπλης - Χρύσα Βογιατζάκη
(3) Βιβλίο [2520]: ΑΡΧΕΣ ΤΗΣ ΕΠΙΣΤΗΜΗΣ ΤΩΝ ΠΕΙΡΑΜΑΤΟΖΩΩΝ, L.F.M. van Zutphen, V. Baumans, A.C. Beyners

1.4. 1st Semester Courses

Health and Laboratory Safety in Biomedical Sciences - First Aid
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190104	**SEMESTER**	**1rst**
COURSE TITLE	**Health and Laboratory Safety in Biomedical Sciences - First Aid**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	2	3
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Compulsory, General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=20 https://moodle.teithe.gr/course/view.php?id=3612

2) LEARNING OUTCOMES

Learning outcomes *The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will*

acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To recognize and understand the basic principles of safe laboratory practice
- To record the categories of best management practices
- To categorize and classify the types of hazards encountered in Biomedical laboratories
- To recognize the personal safety equipment and the laboratory equipment
- To determine the most important causes of work accidents
- To recognize the different agents that cause laboratory diseases
- To recognize laboratory waste management measures
- Determine the required First Aid, according to the risk category, in the laboratory area

2. Skills

- Understand best practices for Biomedical laboratory safety, laboratory functional design
- To understand the hazards of biological and chemical materials used in daily practices.
- Plan and implement best practices for laboratory design
- To propose and formulate laboratory waste management measures
- To provide for the adequacy of personal and laboratory equipment
- Apply the correct use of personal protective equipment and the ways in which they must keep the workplace clean
- Invent alternative methods of using safer laboratory materials and methods
- Anticipate and use the methods by which they can provide basic first aid in response to laboratory incidents

3. Competence

- To be able to present using new technologies tasks-experiments to groups of first year students or groups of secondary school students.
- To develop critical thinking and the ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyze, information, ideas, problems and solutions in order to generate new research ideas.
- To evaluate prevention methods and safe management practice for each laboratory risk category
- To decide on the best provision of First Aid in the laboratory

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

3) SYLLABUS

1. Principles of laboratory safety - Legislative framework - Occupational accidents - Categories of occupational accidents - Prevention.
2. Biological Safety.
3. Chemical safety.
4. Radiation and Safety.
5. Fire protection - Fire safety.
6. Electrical safety - Physical factors.
7. Biotechnology and Safety.
8. Personal Protective Equipment and Laboratory Safety Equipment.
9. Sterilization - Disinfection of Laboratory premises.
10. Laboratory Design
11. Waste Management
12. Occupational Diseases.
13. Providing first aid in the Laboratory

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple*	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions

Activity	***Semester workload***
Lectures	80
Seminar	10
Course total	90

choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	2. Written Assignment, optional, with oral presentation in class (Graded and gives 10% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors.

5) ATTACHED BIBLIOGRAPHY

A. Greek

•Αδαμοπούλου Μ. Γ, 2010. Ασφάλεια και Υγιεινή της εργασίας στα βιο-ιατρικά εργαστήρια, Εκδόσεις Πασχαλίδη,.ISBN: 9789603999843 Κωδ. Εύδοξος [13256551]

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• Παπακωνσταντίνου Κ., Μπελιάς, Χ., 2017. Εργασιακή Υγεία και Ασφάλεια & Ανθρώπινος Παράγοντας, Εκδόσεις Τσότρας Αθανάσιος,ISBN: 978-618-5309-04-6Κωδ. Εύδοξος [68405850]

B. English

• Kumar S, 2012. Biosafety Issues in Laboratory Research. Biosafety 1:e116. doi:10.4172/2167-0331.1000e116

•Leah Mc Ewen, Ralph Stuart, Ellen Swee, Robin Izzo, 2017. Baseline survey of academic chemical safety information practices. Journal of Chemical Health and Safety, Vol 25:3, p.6-10. https://doi.org/10.1016/j.jchas.2017.10.009

•Mohammad Mojtabaei and Mahshid Jalili, 2014. Laboratory Safety Organization. Editorial: Medical Safety & Global Health, 2014: e148 DOI: 10.4172/2167-0331.1000e148

•U.S. Department of Health and Human Services, 2009. Biosafety in Microbiological and Biomedical Laboratories5th Edition.HHS Publication No. (CDC) 21-1112, Atlanta GA.

1.5 1st Semester Courses

COURSE OUTLINE
BIOCHEMISTRY I (STRUCTURE & FUNCTION OF BIOMOLECULES)

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**285-1901051** **285-1901052**	**SEMESTER**	**1rst**
COURSE TITLE	**BIOCHEMISTRY I (STRUCTURE & FUNCTION OF BIOMOLECULES)**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**

Lectures (Theory)	3	4
Lab tutorial	1	
Laboratory Exercise	1	3
Total	5	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General Background Course, Compulsory Course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3613, https://moodle.teithe.gr/course/view.php?id=3614, www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Purpose of the course

Knowledge

The students have to:

• To learn the structure, functionality of the main classes of biomolecules and their role in the structure and function of human body.

• To learn the methods of studying biomolecules and their properties and understand how the properties of the molecules are used in methods of qualitative and quantitative determination.

• To learn the relevant Greek and English terminology

• To acquire knowledge of the international databases and the tools to collect information about the structure and functionality of biomolecules, compare the structure of biomolecules, etc.

Skills

• To acquire skills in the laboratory application of biochemical techniques in studying properties and in qualitative and quantitative determination of basic biomolecules (proteins, carbohydrates, lipids, nucleic acids)
• To acquire skills in the use of basic equipment used in quantitative determinations

such as photometers (simple, microtitration, etc.)

Competence

- To distinguish the basic biomolecules (proteins, carbohydrates, lipids, nucleic acids) and their subcategories based on their structures.
- To recognize the structural characteristics of the biomolecules (proteins, carbohydrates, lipids, nucleic acids) to which specific physical and chemical properties are due.
- To explain how the structural and chemical properties of biomolecules affect their interaction with other biomolecules and the way in which they perform their biological function. To understand the complications arising from the existence of structural abnormalities of biomolecules.
- To understand the principle of the methods for determining and studying the physical and chemical properties of basic biomolecules.
- To understand how the physical and chemical properties of biomolecules such as spectroscopic properties, isoelectric point, complexation with biomolecules, etc. are exploited for the qualitative and quantitative determination of biomolecules with examples of applications in diagnostic techniques.
- To compare methods and choose the appropriate techniques by understanding their advantages and disadvantages.
- To be able to make the appropriate adjustments (dilutions, etc.), if necessary, in order to apply techniques and get the final results.
- To choose and combine techniques in order to answer complex questions (eg for the qualitative determination of carbohydrates).
- To judge the reliability of a technique application, to recognize possible errors and to propose the right way of applying the technique reliably.
- To recognize the different possibilities offered by different quantification techniques in terms of sensitivity, assay interference, etc.,
- To have the ability to describe the application of a laboratory technique and its result.
- To be able to understand and explain the principle of Spectrophotometry, Absorption spectrum, fluorescence, phosphorescence, luminescence. Mass spectroscopy, Flame photometry, Nephelometry, Turbidometry, refractometry and their use in determination techniques of biomolecules.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*

Production of new research ideas	*Others…* *…….*
Working independently Team work Adapting to new situations Decision-making Working in an interdisciplinary environment Production of new research ideas Criticism and self-criticism	

3) SYLLABUS

THEORY (285-1901051)

Water as a solvent. Important biomolecules of the organism. Structure, properties and biological role of proteins, carbohydrates, lipids and nucleic acids. Enzymes. Categories-Enzyme properties-Enzyme inhibitors & activators. Applications of enzymes in the diagnosis and treatment of diseases. Structure, and biological role of hormones. Structure and biological role of vitamins. Ions-trace elements, ion pumps. Abnormalities of biomolecule structure and related pathological conditions.

In particular, the course includes the development of the following modules:

· Basic composition of the human body - The role of water as a solvent – Behaviour of acids, bases, salts and macromolecules in an aqueous environment - Buffer solutions.

· Structural units of proteins: amino acids: Structure – Physical and chemical properties – Methods of amino acid detection – Modified amino acids

· Protein structure – primary structure and higher conformations of proteins. Polyprotein complexes. Classification of proteins based on structure and function – the role of post-translational modification. Properties of proteins – Utilization of protein properties in detection and separation techniques. Variations in protein structure and pathological conditions – examples).

· Enzymes. Enzyme classification. Factors affecting enzyme activity. Enzyme inhibitors-activators and their applications in diagnosis and therapy.

· Carbohydrates. Structure and function of mono- and oligo-saccharides, hono-polysaccharides and hetero-polysaccharides. The role of glycosylation. Glycoproteins and proteoglycans – structure and role. Properties of carbohydrates. Use of carbohydrate properties in determination techniques.

· Lipids. Lipid categories – structure and physiological function. Properties of lipids and their use in separation and determination techniques.

Nucleic acids. Species – structure – biological role. Properties and their use in separation and determination techniques.

· Intercellular communication. Structure and types of hormones. Mechanism of action of water-soluble and fat-soluble hormones – examples. Endocrine system.

· Vitamins. Vitamin classes, structure and biological role.

· Ions – physiological role. Ion pumps.

LABORATORY (285-1901052)

Biochemical Laboratory Equipment (Types of apparatus, principle of operation and uses). Using, checking and setting up micropipettes.

Introduction to the basic laboratory techniques of a Biochemical Laboratory. Spectrophotometry.

Absorption spectrum, fluorescence, phosphorescence, luminescence. Mass spectroscopy, Flame photometry, Nephelometry, Turbidometry, refractometry.

Laboratory application in the determination of biomolecules. Methods for the determination of amino acids, proteins, carbohydrates, lipids and nucleic acids. Enzyme determination methods

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>With face-to-face or online lectures.

Laboratory Exercise in the Biochemistry lab room</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Presentations and lectures using audio-visual media.

• Use of e-class (moodle) for posting:

- power point presentations, scientific articles, instructions, useful links, lab-made videos, self-assessment quizzes, assignment and submission of assignments.

- Construction of a Laboratory Techniques video application for posting on the asynchronous education platform (moodle).

Construction of self-examination quiz in Google forms for posting on moodle.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures using audio-visual media</td><td>110</td></tr>
<tr><td>Lab exercises in groups of 20 students: Practical laboratory exercise and brief description of the laboratory process and results</td><td>110</td></tr>
<tr><td>Total</td><td>210</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</td><td>Theory
Written final exam including:
Multiple Choice Test
Short Answer Questions
Project assignment (optional)
Intermediate examination of part of the material.

Laboratory
• Results of laboratory exercises and their brief</td></tr>
</table>

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	presentation Written/oral final exam with multiple choice, short Answer Questions • Laboratory Exercise, Related written project

5) ATTACHED BIBLIOGRAPHY

1."BIOCHEMISTRY with references to the biochemical basis of pathological conditions and the principles of biochemical techniques" by Christos Petrou, Phaedras Eleftheriou, UniversityStudioPress, Thessaloniki, 2007 (EVDOXOS: Book [17154]) (in Greek)
2. "BIOCHEMISTRY METHODS with examples of applications in Diagnostics, by Phaedra Eleftheriou, Christos Petros, Evgenias Lymperaki. University Studio Press, Thessaloniki, 2010 (EVDOXOS: Book [17614]) (in Greek)
3."Biochemistry Laboratory Exercises" by Christos Petros, Phaedra Eleftheriou, Eugenia Lymperaki, and Anastasia Psycha (notes, printing office).
4."BIOCHEMISTRY" BERG M. JEREMY, TYMOCZKO L. JOHN, STRYER (English)
5. Related scientific journals.

1.6. 1st Semester Courses

BASIC HISTOLOGY & METHODS OF STUDY
GENERAL EMBRYOLOGY
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285 – 1901061 285-1901062	**SEMESTER**	**1st**
COURSE TITLE	**Basic Histology & Methods of Study - General Embryology**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	2	3
Laboratory practice	1	2
	3	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Compulsory Course, Special Background Course

PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https:moodle.teithe.gr/course/view.php?id=3615 https:moodle.teithe.gr/course/view.php?id=3616

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. **Knowledge**
   - To learn the embryogenesis of human organism
   - To recognize the congenital abnormalities / organ system
   - To study microscopically the 4 basic tissues
   - To learn the Techniques for preparing tissue sections for Light and Electron Transmission & Scanning microscopy
2. **Skills**
   - To apply the stages of the Histological technique : fixation, embedding , sectioning, staining with Hematoxylin / Eosin staining and Special Histochemical Stains
   - To interpret the results of histochemical techniques and be able to correct the errors of the techniques.
3. **Competence**
   - To develop cooperation with research groups
   - To be able to apply new specialized techniques for the benefit of Medical Science.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

Respect for the natural environment

3) SYLLABUS

Theory

Introduction to Histology:

Cell Differentiation - Cytoplasm - Cytoplasmic Organelles - Inclusions - Clinical correlation.

Nucleus : Components - Cell renewal - Cell cycle /death (Necrosis – Apoptosis)- Stem cells & Tissue Renewal- Clinical Correlation.

Basic Tissues:

- Epithelial tissue - Characteristic features - Specialization of the apical cell surface -Types & Classification -Transport across Epithelia – Renewal of epithelial cells
- Connective tissue - Cells – Fibers – Extracellular matrix – Types.
- Nerve tissue - Neurons – Glial cells - Neural Regeneration.
- Muscle tissue - Skeletal - Cardiac – Smooth & Muscle tissue Regeneration.

General Embryology: Gametogenesis - From ovulation to implantation-Bilaminar & Trilaminar Embryonic disk – Early & Late Embryionic Period - Embryonic membrane & Placenta.

- Congenital anomalies.

Cell : Nucleus and Cytoplasm – Cellular components - Cellular Function – Cell cycle

Basic Tissues: Epithelial - Connective - Nerve and Muscle .

Laboratory Histology & Methods of Study - Preparation of tissues for study: Fixation – Embedding - Sectioning- Staining for Light and Electron –Transmission and Scanning Microscopy - Histochemistry - Cytochemistry & Immunochistochemistry -Problems in the study of tissue sections.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	***Activity*** / ***Semester workload***
	Lectures and Laboratory training: 100
	Writing a paper: 20
	Course total: 120
STUDENT PERFORMANCE EVALUATION	1. Theory Written final exam may include:

Description of the evaluation procedure *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	- Multiple Choice questionnaire - Short answer questions 2. Laboratory Written Assignment, optional, with oral presentation in class (Graded and gives 10% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors.

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Mescher A.L. Junqueira's Βασική Ιστολογία (6η Ελληνική Έκδοση). Εκδόσεις Π.Χ, Πασχαλίδης,2017.
2. RossM. H. Ιστολογία με Έγχρωμο Άτλαντα (1η Ελληνική Έκδοση).Ιατρικές Εκδόσεις Λίτσας, 2013.
3. Kierszenbaum A.Ιστολογία με στοιχεία Κυτταρικής Βιολογίας (1η Ελληνική Έκδοση).Εκδόσεις Π.Χ, Πασχαλίδης,2013.
4. GartnerL.G., HiattJ.H. Ιστολογία(3η Έλληνική Έκδοση).
5. SadlerT. Langman's Ιατρική Εμβρυολογία (1η Ελληνική Έκδοση).Ιατρικές Εκδόσεις Λίτσας, 2002. Εκδόσεις Παρισιάνου,2011
6. Moore,Persaud,Shiota. Έγχρωμη Κλινική Εμβρυολογία (1η Ελληνική Έκδοση). Εκδόσεις Π.Χ, Πασχαλίδης,1997.

B. English

1. KiernanJ. A. Histological and Histochemical Methods: Theory and Practice(5th Edition). Scion Publishing Limited, 2015.
2. Ovalle W. K., Nahirney P. C. Netter's Essential Histology(2nd Edition). Saunder's, 2013.
3. Young B., Lowe J., Stevens A., Heath J. W. Wheater's Functional Histology. A Text and Colour Atlas (5th Edition). Churchill Livingstone Elsevier,2006.
4. Hammersen F. Sobotta/Hammersen Histology- Color Atlas of Microscopic Anatomy. (3rd Edition). Urban & Schwarzenberg, 1985.

2.1. 2nd Semester Courses

COURSE OUTLINE

BIOCHEMISTRY II (BIOMOLECULES METABOLISM – METABOLISM DISORDERS)

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**285-1902011 285-1902012**	**SEMESTER**	**2nd**
COURSE TITLE	**BIOCHEMISTRY II (METABOLISM OF BIOMOLECULES – DISORDERS OF METABOLISM)**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	3	4
Lab tutorial	1	
Laboratory Exercise	2	3
Total	6	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General Background Course, Compulsory Course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3651, https://moodle.teithe.gr/course/view.php?id=3652, www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The purpose of the course is to help students to lern and understand the metabolism of basic biomolecules (proteins, carbohydrates, lipids, nucleic acids) and special categories of biomolecules (hormones, vitamins, xenobiotics), as well as the effects of disturbances of the metabolic pathways that sustain life with reference to the most important pathological conditions related to them.
In the laboratory, the students practice the techniques of separation and isolation of

biomolecules, they apply techniques of extraction, electrophoresis, chromatography, subcellular fractionation and evaluation of their successful application and are introduced to cell culture techniques.

Knowledge

• In particular, they learn the biochemical pathways of the breakdown of basic biomolecules (proteins, carbohydrates, lipids, nucleic acids) into smaller molecules (catabolism) and the regulation mechanisms of catabolism depending on the body's needs for breakdown products.
• They learn the contribution of various organs such as the stomach, liver, pancreas and intestine to the catabolism of food.

- They learn to differentiate the mechanisms of metabolizing basic food biomolecules in the digestive system from the catabolism of biomolecules within tissue cells and the factors that influence these processes.

• They also learn the catabolism/modification of specific biomolecules such as hormones.
• They learn the biochemical pathways of biosynthesis (anabolism) of basic biomolecules (proteins, carbohydrates, lipids, nucleic acids) and relative regulation mechanisms as well as the biosynthesis of specific molecules such as hormones and neurotransmitters. They also learn vitamin modification reactions.

- Finally, they learn the main and alternative biochemical pathways of energy production and the factors that regulate them.

In the laboratory:

- they learn biomolecule isolation and separation techniques such as electrophoresis, chromatography, extraction, fractional centrifugation.

• In both the theoretical and the laboratory part, they learn Greek and English terminology.

Skills
• In the context of the laboratory exercises, they acquire skills in the application of chromatography, electrophoresis, extraction, fractional centrifugation techniques for the separation of biomolecules such as amino acids, proteins and lipids as well as in the separation of subcellular particles.
• Acquire skill in the preparation of solutions, materials and gels required in the various separation techniques
• They acquire skill in the use of various instruments used in separation techniques such as electrophoresis devices, chromatography, centrifuges, etc.

- They acquire the skill to present their knowledge or experimental results.

- They acquire skills in literature search

Competence

In the theoretical part of the course, by studying selected examples, they acquire the ability:

a) to understand and recognize how metabolic disorders can lead to various

pathological conditions (biochemical basis of diseases)
b) to understand how the change in the structure, concentration or activity of a biomolecule may be associated with a specific disorder and by extension how biomolecules can be biological markers for diagnosis or pharmaceutical targets for the treatment of diseases.

At the Laboratory, they acquire the ability to:

- distinguish the differences in biomolecule separation techniques in terms of the properties of the biomolecules they rely on, the types of biomolecules they can separate, the resolution and sensitivity, the ease of application, and the equipment required, and provide examples of their application in diagnostics and research.
- They acquire the ability to choose the appropriate techniques according to the molecules to be separated and to interpret and present the result of applying the techniques.
- They acquire the ability to evaluate the success of the separation techniques and identify factors that can affect the successful application of the technique and the reliability of the result.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working independently
Team work
Adapting to new situations
Decision-making
Working in an interdisciplinary environment
Production of new research ideas
Working in an international environment
Working in an interdisciplinary environment
Criticism and self-criticism

3) SYLLABUS

THEORY

Metabolism of proteins, carbohydrates, lipids and nucleic acids (Catabolism of biomolecules in the digestive system & intracellular catabolism)

Biosynthesis of basic biomolecules (proteins, carbohydrates, lipids, nucleic acids

(Anabolism). Mechanisms of regulation of catabolism and anabolism.

Biosynthesis and catabolism of hormones. Vitamin metabolism processes. Metabolism of xenobiotics.

Biochemical mechanisms of energy production and reducing power.

Biomolecule metabolism disorders and related pathological conditions.

LABORATORY EXERCISE

Introduction to separation methods.

Extraction techniques

Electrophoresis techniques (paper, cellulose acetate, agarose, polyacrylamide)

Factors affecting Electrophoresis conditions (absence and presence of denaturing agents, ampholytes, etc.)

Native and Denaturing Electrophoresis

Isoelectric focusing, Immunoelectrophoresis

Two-dimensional electrophoresis

Special sample treatments

Detection techniques depending on the type of biomolecules.

Chromatography Techniques (paper, TLC, column: molecular filtration, ion exchange, adsorption, adsorption, gas chromatography, HPLC)

Theoretical study of applications of separation methods in the separation and isolation of amino acids, proteins, enzymes, carbohydrates, lipids, nucleic acids and examples of applications in diagnostics

Laboratory application of biomolecule separation and detection methods: TLC chromatography, ion exchange column chromatography, HPLC, paper, agarose and acrylamide electrophoresis).

Cell structure and subcellular fractionation: Laboratory application of subcellular fractionation, evaluation of the success of the method by determining the activity of selected enzymes located in specific subcellular organelles, study of subcellular fractions.

Basic principles of cell cultures: Laboratory application of cell culture passaging (subculturing).

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	With face-to-face or online lectures. Laboratory Exercise in the Biochemistry laboratory
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	• Presentations and lectures using audio-visual

<table>
<tr><td>Use of ICT in teaching, laboratory education, communication with students</td><td>media.
• Use of e-class (moodle) for posting:
- power point presentations, scientific articles, instructions, useful links, lab-made videos, self-assessment quizzes, assignment and submission of assignments.
- Construction of a Laboratory Techniques video application for posting on the asynchronous education platform (moodle).
- Construction of self-examination quiz in Google forms for posting on moodle.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures using audio-visual media</td><td>120</td></tr>
<tr><td>Lab exercises in groups of 20 students: Practical laboratory exercise and brief description of the laboratory process and results</td><td>90</td></tr>
<tr><td>Total</td><td>210</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Theory
Written final exam including:
Multiple Choice Test
Short Answer Questions
Project assignment (optional)
Intermediate examination of part of the material.

Laboratory
• Results of laboratory exercises and their brief presentation
Written/oral final exam with multiple choice, short Answer Questions
• Laboratory Exercise, Related written project</td></tr>
</table>

5) ATTACHED BIBLIOGRAPHY

- "BIOCHEMISTRY with references to the biochemical basis of pathological conditions and the principles of biochemical techniques" by Christos Petrou, Phaedra Eleftheriou, University Studio Press, Thessaloniki, 2007 (EVDOXOS: Book [17154]) (in Greek)

- "BIOCHEMISTRY METHODS with examples of applications in Diagnostics, by Phaedra Eleftheriou, Christos Petros, Evgenia Lymperaki University Studio Press, Thessaloniki, 2010 (EVDOXOS: Book [17614]) (in Greek)
- "Biochemistry Laboratory Exercises" by Christos Petros, Phaedra Eleftheriou, Eugenia Lymperaki, and Anastasia Psycha (notes, printing office).
- "BIOCHEMISTRY" BERG M. JEREMY, TYMOCZKO L. JOHN, STRYER LUBERT
- Related articles of scientific journals

2.2. 2nd Semester Courses

Human Genetics
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1902021 285-1902022	**SEMESTER**	**2nd**
COURSE TITLE	**Human Genetics**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	3	4
Tutorial	1	
Laboratory	2	3
Total	6	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Compulsory, Special Background

PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=15 https://moodle.teithe.gr/enrol/index.php?id=3653, https://exams-phym.the.ihu.gr/course/view.php?id=36 https://moodle.teithe.gr/enrol/index.php?id=3654,

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The aim of the course. The main teaching goal of the course is to enable students to understand the general principles of genetics, reproduction and heredity, genetic diversity and mutations, as well as diseases and conditions related to the human genome. In addition, laboratory objectives of the course include the knowledge of the basic principles of genetics and the laws of heredity, developing skills in the observation and identification of morphological characteristics of model organisms, and application of basic techniques of molecular genetics and cytogenetics.
Upon completion of the course, students are expected to have acquired:

1. Knowledge

- Recognize and understand the basic principles and scientific terminology that underlie the discipline of genetics
- Understand the chromosomal basis of heredity and the conservation of genetic information through mitotic and reductive cell division
- Identify, appreciate and differentiate the role of factors that create genetic diversity in sexual reproduction
- Be familiar with the principles and models of gene heredity and be in a position to implement them to resolve problems
- Understand and differentiate the mechanisms of mutagenesis and their role in the development of diseases of genetic origin
- Understand and differentiate the pathogenesis of various diseases and syndromes of genetic origin
- Be familiar with the genetic background of the hemoglobin diseases and thalassemia syndromes and the basic methods for the determination of human hemoglobin levels
- Understand the genetic basis of cancer and the genes associated with the development of different types of cancer.

2. Skills

- Understand the principles of laboratory methods of cytogenetics and molecular genetics
- Apply, estimate, combine and evaluate the technical part of cytogenetic analysis

methods for the prenatal diagnosis of human genetic diseases (karyotype, identification of numerical and structural chromosomal abnormalities).
- Be able to detect morphological features of organisms and gender differences by observation under a stereoscope
- Apply, estimate, combine and evaluate the techniques of molecular genetics methods used to identify point mutations associated with diseases of genetic origin and/or predisposition to such diseases in laboratory practice.

3. Competence

- Be able to present projects-experiments using new technologies to groups of first-year students or groups of secondary school students.
- Be familiar with genealogical tree symbols so that they can construct their own genealogical family tree
- To develop critical thinking and the ability to identify and solve problems (troubleshooting) in the qualitative evaluation of laboratory cytogenetic analysis tests and molecular genetics tests working alone or in groups.
- Become familiar with stereoscopic observation and discrimination of morphological characteristics of model organisms such as Drosophila melanogaster, so that they can perform selective intercrosses to evaluate the pattern of heredity of traits.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

3) SYLLABUS

THEORY

- Historical evolution of genetics
- Chromosomal basis of heredity
- Cell division (Mitosis - Reduction)
- The reproductive system - Spermatogenesis - Oogenesis
- Structure and functions of chromosomes and genes
- Modern technology in disease diagnosis
- Cytogenetics - Karyotype
- Types of Heredity
- Genetic diversity and mutations

- Hemoglobins and hemoglobin diseases
- Biochemical Genetics - Immunogenetics
- Genetic origin of major diseases
- Cancer genetics
- Genetic guidance and prenatal diagnosis

LABORATORY

- Introduction to basic concepts and principles of genetics
- Methodology and problem-solving exercises in Mendelian inheritance and the main types of gene inheritance
- Parthenogenesis and the Artemia (hatching of Artemia franciscana cysts and observation of nauplii and adults under the stereoscope)
- Drosophila melanogaster (presentation of the organism and stereoscopic observation of individuals from the wild and various laboratory mutants in terms of body colour, eye color, etc.)
- Electrophoresis of human adult hemoglobin
- G-banding karyotyping technique and analysis with special karyotyping software
- Isolation of chromosomal DNA from whole blood or parietal cells
- Polymerase chain reaction and subsequent restriction enzyme digestion (PCR-RFLP) to identify mutations involving thrombophilic factors
- Agarose gel electrophoresis and evaluation of PCR-RFLP results

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In the classroom, face to face.

The laboratory is held at the Molecular Biology-Genetics & Medical Biotechnology Laboratory</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Basic software (windows, word, power point, the web, etc.).
Support of learning process through the electronic platform / e-class</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>120</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Laboratory paper preparation</td><td>10</td></tr>
<tr><td>Laboratory</td><td>80</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>210</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure</td><td>Theory

1. Written final exam may include:</td></tr>
</table>

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	- Multiple Choice questionnaire - Short answer questions - Matching questions - True-false questions with justification - Problem solving 2. Written assignment (optional), with public presentation (Graded and contributes 10% to the total grade of the final theory exam). Laboratory 1. Daily assessment of students with theory and hands-on exercises in the laboratory (not graded). 2. Written final examination may include: Multiple Choice Test. Short answer questions Matching questions True-false questions with justification Problem solving 3. Compulsory written assignment - construction of a family tree (Graded and contributes 10% to the final grade of the final theory examination). **Total course grade: Theory grade 60% + Laboratory Grade 40%** For Erasmus students who may have selected the course, an assignment is given in the course subject area, which will be presented and examined in English.

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Thompson & Thompson ΙΑΤΡΙΚΗΓΕΝΕΤΙΚΗ. NUSSBAUM R., McINNES R.R., WILLARD H.F. BROKEN HILL PUBLISHERS LTD, 8ηέκδ./2011. Κωδικός Βιβλίου στον Εύδοξο: 13256587
2. Lewin's Βασικές Αρχές Γονιδίων. Krebs Jocelyn E., Goldstein Elliott S., Kilpatrick Stephen T. Broken Hill Publishers Ltd, 1η έκδ./2022. Κωδικός Βιβλίου στον Εύδοξο: 102070105
3. Βασικές Αρχές Γενετικής. Klug, Cummings, Spencer, Palladino. ΑΚΑΔΗΜΑΪΚΕΣΕΚΔΟΣΕΙΣ Ι.ΜΠΑΣΔΡΑ & ΣΙΑ Ο.Ε. Έκδοση: 1η/2019. Κωδικός Βιβλίου στον Εύδοξο: 94644420
4. ΓΕΝΕΤΙΚΗ – Από τα Γονίδια στα Γονιδιώματα. Hartwell Leland, Hood Leroy, Goldberg Michael, Reynolds Ann, Silver Lee. UTOPIA ΕΚΔΟΣΕΙΣ ΕΠΕ.Κωδικός Βιβλίου στον Εύδοξο:32997976
5. Γενετικές Ασθένειες. Μιχαήλ Γ. Λουκάς. ΙΩΑΝΝΗΣ Β. ΠΑΡΙΣΙΑΝΟΣ, Έκδοση: 1η/2015
6. Η επιγενετική επανάσταση, Νέσα Κάρει. ΧΑΡΙΤΟΣ ΧΡ. ΠΑΝΑΓΙΩΤΗΣ, Έκδοση: 1/2015
7. Η Γενετική Ιστορία της Ελλάδας, Τριανταφυλλίδης Κωνσταντίνος. ΕΚΔΟΣΕΙΣ ΚΥΡΙΑΚΙΔΗ ΙΚΕ, Έκδοση: 2/2014

B. English

1. Genes VIII. Benjamin Lewin. Pearson Education LTD., London, 2004
2. Molecular Biology of the Gene. James Watson, Tania Baker, Stephen Bell, Alexander Gann, Michael Levine, Richard Losick. Pearson, 7th Edition/2014

2.3. 2nd Semester Courses

General Microbiology

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1902031 285-1902032	SEMESTER	2nd
COURSE TITLE	**General Microbiology**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Lectures (Theory)	3	4
Tutorial	1	
Laboratory practice	2	3
	6	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Special Background Course, Compulsory course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3655, https://moodle.teithe.gr/course/view.php?id=3656, http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

Knowledge

• To acquire general knowledge about microorganisms (classification, structure, morphology)

•To recognize the basic biological characteristics and biochemical properties of pathogenic bacteria that contribute to the pathophysiology of infection and the manifestation of the disease they cause.
• To recognize the most important bacteria that cause infections and how they are transmitted.
• To learn about sterilization- disinfection- antisepsis-pasteurization and sterilization methods.
• to describe the prevention of bacterial infections through immunization.
•To learn about antibiotics and antimicrobial resistance
• To describe the laboratory diagnosis of different microorganisms by applying various methods (culture, serological methods regarding the isolation, detection and identification of bacteria).
•To understand internationally used terminology

Skills
• To have understood the principles of laboratory diagnosis of infections and to have become familiar with isolation, culture, identification/typing detection methodologies as well as with the interpretation and evaluation of laboratory findings.

Learn to use microscopy
• Apply the diagnostic methods used in the diagnosis of bacteria (stains etc)
• To be able to inform about the correct procedure for receiving, maintaining and transporting biological samples.
• To apply principles of personal and environmental protection against microorganisms

Competence
• To be able to present using new technologies work-experiments to groups of first-year students.
• To develop critical thinking and ability to identify and solve problems, working alone or in groups.
• To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility and sensitivity to gender issues
Decision-making	Criticism and self-criticism
Working independently	Production of free, creative and inductive thinking
Team work	……
Working in an international environment	Others…
Working in an interdisciplinary environment	…….
Production of new research ideas	

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

Theory

- Classification of microorganisms
- Structure, morphology, reproduction, genetics of microorganisms.
- Antimicrobial agents- Antibiotics. Antimicrobial resistance.
- Sterilization- Disinfection- Antisepsis-Pasteurization. Sterilization methods.

- Culture, isolation and identification methods of bacteria, phenotypic and genotypic properties of the bacteria.
- Acquired Immunity (active and passive).
- Antigens- Antibodies-Vaccines
- Laboratory methods of serologic diagnosis.
- Blood types

LABORATORY

- Introduction to Diagnostic Microbiology. Laboratory Equipment, Principles of Laboratory Safety, Methods used for the laboratory diagnosis of bacteria. Stains in Microbiology. Sterilization- Use of incubators. Culture, isolation and identification methods of bacteria. Use of microscope. Blood types

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Activity / Semester workload Lectures 120 Laboratory practice 60 Course total 180
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions Laboratory 1. Theoretical an practical exercises (non graded) 2. Written final exam may include: - Multiple Choice questionnaire - Short answer questions - Laboratory results inerpretation

5) ATTACHED BIBLIOGRAPHY

-Recommended References:

A. Greek references

- Murray P, Rosenthal K, Pfealler M. Ιατρική Μικροβιολογία. (Ελληνική Έκδοση. Επιμέλεια Ν. Α Μαλισιόβας, Α. Παππά – Κονιδάρη, Τ. Α Βυζαντιάδης, Γ. Γκιούλα, Μ. Εξηντάρη, Α. Σκούρα, Μ. Καχριμανίδου, Ε. Πρωτονοταρίου, Δ. Χατζηδημητρίου και Ε. Μπακάλη). Εκδόσεις Παρισιάνου. Αθήνα, 2016.
- Παπαπαναγιώτου Ι., Κυριαζοπούλου-Δαλαΐνα Β. Εισαγωγή στην Ιατρική Μικροβιολογία, Ιολογία και Ανοσολογία. Εκδόσεις University Studio Press.Θεσσαλονίκη, 2005.
- Tortora J.G., Funke R.B., Case L.Chr. Εισαγωγή στην Μικροβιολογία. 2η ελληνική έκδοση. Γενική Επιμέλεια Τσακρής Α. Broken Hill Publishers LTD. Εκδόσεις Πασχαλίδης Π.Χ., 2017.
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  2011.
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  Θεσσαλονίκη, 2018.

B. English references

- Murray P, Rosenthal K, Pfealler M. Medical Microbiology. 7 ed Elsevier 2012.
- Mark Gladwin, William Trattler, C. Scott Mahan. Clinical Microbiology Made RidiculouslySimple. 6 ed. Medmaster 2014.
- Warren Levinson. Review of Medical Microbiology and Immunology. 13 edition. LangeMedical Books. 2014.

C. Scientific journals

J of Antimicrob Chemotherapy,
J Glob Antimicrob Resist.,
Recent Pat Antiinfect Drug Discov,
Microb Drug Resist.,
New Microbiol.,
Eur J Clin Microbiol Infect Dis,
J of Clinical Microbiology

2nd Semester Courses

HUMAN ANATOMY

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190204	SEMESTER	2nd
COURSE TITLE	**HUMAN ANATOMY**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Theory	3	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	General Background Course, Compulsory Course
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3657, http://www.mls.teithe.gr

2)**LEARNING OUTCOMES**

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, the student is expected to:

1. Knowledge

- Knows and understands the structure of the organs of the human body as well as their topographical and functional relationships.
- Knows and understands the structure and morphology of the main components of the musculoskeletal system (bones, joints, muscles) as well as the topographical and functional relationships between them.

2. Skills

- Identifies, distinguishes and describes the position and structure of basic

anatomical structures, organs and systems of the human body.

- Proceeds to the identification, marking and clinical evaluation of the above-mentioned anatomical areas.
- Has a good knowledge of the medical terminology related to the anatomy of the human body.

3. Competence

- Ability to relate knowledge of anatomy and physiology.
- Search for anatomy atlases and anatomical preparations in online scientific databases.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Working in an interdisciplinary environment

3) SYLLABUS

- Cells and tissues.
- Anatomy of the Systems of the Human Body
  - Skeletal System, Muscular System, Nervous System, Endocrine System, Cardiovascular System, Respiratory System, Digestive System, Urinary System, and Reproductive System
- Students exercise on human anatomical models in order understand the structure, morphology, topographical anatomy and boundaries of some visceral organs, their adjacencies and relationships

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Use of the moodle e-learning platform in order to upload scientific articles, instructions, lectures, useful links, figures of anatomical preparations, questionnaires, information for attending conferences and seminars related to the course, etc.
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits,	

Activity	Semester workload
Lectures	150
Total	150

project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Written final exam may include: - Multiple Choice questionnaire - Short answer questions

5) SUGGGESTED LITERATURE

1. Βιβλίο [22767962]: Κλινική Ανατομία 2η έκδοση, Moore K.L.
2. Βιβλίο [77108616]: Ανατομική του Ανθρώπου 2η έκδοση, Καραπάντζος Ηλίας, Καραπάντζου Χρυσάνθη

2nd Semester Courses

Nuclear Medicine Physics
COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190205	**SEMESTER**	**2nd**
COURSE TITLE	Nuclear Medicine Physics		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Theory		2	4
		2	4
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail in (d).			
COURSE TYPE *general background, special background, specialized general*	General background Course, compulsory Course		

knowledge, skills development	
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills, and competencies of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for Writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

The purpose of the course is:
- to acquire the required theoretical and technical knowledge of medical physics
- to learn radiobiology
- to learn the different diagnostic techniques based on electromagnetic radiation
- to learn the different therapeutic techniques based on radiation
- to learn Functional Measurements in Nuclear Medicine
- to understand Quantitative Nuclear Medicine
- to learn about Internal Dosimetry
- to learn the principles of magnetism
- to learn the principles of electricity
- to learn the principles of optics
- to learn the principles of mechanics
- to learn the principles of sound waves
- to learn the principles of energy
- to learn the principles of heat

2. Skills

-To Understand the spectrum of electromagnetic radiation and radioactivity.
-To Understand and apply radioactivity in various techniques for the study of biomolecules.
- To be aware of Radionuclide Production
- To understand Radiation biology, diagnosis, and therapy
-To be aware of radiation protection for the patient, the technician, and the common man.
- To apply electricity and magnetism in the diagnosis and treatment of diseases.
- To understand optics and the applications in the human body Light Eyes Vision
- To understand sound and ultrasound and their applications in the human body Speaking, Listening
- To understand
Biophysics of the Human Organism

Movement and applications in the body
Energy and applications in the body
Heat and applications in the body
Applications of ultrasound, optics, heat,
Energy and metabolism
Physics of breathing
Physics of the Heart and Lungs
Sound speech and hearing
Electricity and Magnetism in the human body
Biofeedback and control
Body statics, movement, and muscle physics

3. Competence

The course aims

-to give theoretical and practical knowledge of diagnostic and therapeutic nuclear medicine physics and to prepare for work as a medical physicist in nuclear medicine
- To be familiar with how radiation helps the diagnosis and treatment of disease.
- To be aware of applications of fluid pressure and flow to the body and movement
- To evaluate the applications of electricity and magnetism in the human body
- To manage therapeutic techniques

General Competences

Taking into consideration the general competencies that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional, and ethical responsibility and sensitivity to gender issues*
Teamwork	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative, and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search, analysis and synthesis of data and information, using the necessary technologies

Autonomous work

Teamwork

Work in an interdisciplinary environment

Work in an international environment

Generating new research ideas

(3) SYLLABUS

Theory:

Basic Physics for Nuclear Medicine, Basic Radiobiology

Physical principles of radiodiagnosis. Physical principles of radiation therapy. Physical principles and applications of nuclear medicine. Biological effects of ionizing radiation. Radiation protection elements. Basic principles of nuclear medicine. Applications in hematology, gastroenterology, endocrinology, digestive system, neurology, ophthalmology, nephrology-urology, otorhinolaryngology,

respiratory system, and cardiology. Radioimmunological and radio immunometric tests (RIA and IRMA). Elements of nuclear physics. Dosimetry. Biological actions of radiation. Basic principles of diagnostic methods with a radioactive tracer. General guidelines for a nuclear medicine laboratory. Radiation measurement – sample measurements. Nuclear radiation detectors – measurement of the γ-radiation spectrum. Scintigraph. c-Camera. Tomographic camera – SPET. PET camera. Origin and preparation of radioactive nuclides. Radiopharmaceuticals.
Applications of ultrasound, optics, heat,
Energy and metabolism
Applications of fluid pressure and flow to the body and movement
Physics of breathing
Physics of the Heart and Lungs
Sound speech and hearing
Electricity and Magnetism in the human body
Biofeedback and control
Body statics, movement, and muscle physics.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, and communication with students*	Basic software (windows, word, PowerPoint, the web, etc.). Support of the learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem-solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Theory 1. Written final exam may include: - Multiple Choice Questionnaire - Short answer questions 2. Written Assignment, optional, with an oral presentation in class (Graded and gives 10% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, the workload of professors, and other factors.

Activity	***Semester workload***
Lectures	120
Course total	120

(5) ATTACHED BIBLIOGRAPHY

1. «Φυσική ΙΙ», Βοσνιάκος Φ (ΕΥΔΟΞΟΣ: Βιβλίο [18548881]).

2. Επίτομη ιατρική φυσική, 2012, Ψαρράκος Κυριάκος, Μολυβδά - Αθανασοπούλου Ελισάβετ, Γκοτζαμάνη - Ψαρράκου Άννα, Σιούντας ΑναστάσιοΔιαθέτης (Εκδότης): UniversityStudioPress Α.Ε.
3. ΓΡΑΜΜΑΤΙΚΟΣ Κ. ΦΙΛΙΠΠΟΣ (και με τη συνεργασία 83 διεθνών και ελλήνων συναδέλφων), 2014 5η εκδοση, Εκδοτικό οίκος αδελφών Κυριακίδη ISBN: 978-960-467-481-7
4. Φυσική του Ανθρωπίνου Σώματος Irving P. Herman Εκδόσεις πασχαλίδη
5. Ακτινοβολίες και ακτινοπροστασία, Κ.Κάππας, Κ. Θειοδωρου, Brokenhill Τόμος 1,2

3.1. 3rd Semester Courses

Bioethics
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190301	**SEMESTER**	**3rd**
COURSE TITLE	**Bioethics**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Tutorials (Theory)	2	2
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General Knowledge Course, Compulsory course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=65 https://moodle.teithe.gr/course/view.php?id=3617

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and*

Appendix B

- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. **Knowledge**
   Recognize ethical issues that arise in healthcare and applications of Biology.
   Understand ethical aspects and considerations in health sciences.

2. **Skills**
   To take into account bioethics principles in the research
   To recognize any possible abuse in health sciences and biotechnology.

3. **Competence**
   To develop critical thinking and the ability to identify and overcome bioethical issues
   To provide advice in people facing bioethical dilemmas in healthcare or research.
   To contribute in the analysis and synthesis of data, information, ideas and solutions in ethical issues that may arise in the future by new methods and practices in health sciences and biotechnology

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
	Respect for difference and multiculturalism
	Respect for the natural environment
Adapting to new situations	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Decision-making	*Criticism and self-criticism*
Working independently	*Production of free, creative and inductive thinking*
Team work	*……*
Working in an international environment	*Others…*
Working in an interdisciplinary environment	*…….*
Production of new research ideas	

Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
Working independently
Decision-making
Working in an international environment
Working in an interdisciplinary environment

3) SYLLABUS

Ethical issues in : biotechnology , biobanks' data process, cloning, gene therapy, genetic engineering, transgenic plants and animals generation, assisted reproductive techniques, euthanasia and human organ transplantation.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of*	

Activity	***Semester workload***
Lectures	60

bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*		
	Course total	60
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Written final exam may include: - Multiple Choice questionnaire - Short answer questions	

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Βιοηθική,Βαγδατλή Ελένη Εκδότης : Αλτιντζής Α. Αθανάσιος
2. Βιοηθική Δεοντολογία και Νομοθεσία στις Επιστήμες Υγείας, Ιωάννης Πουλής, Ευγενία Βλάχου . Κωνσταντάρας Ιατρικές εκδόσεις

B. English

1. Jonathan Pugh, Autonomy, Rationality, and Contemporary Bioethics Oxford (UK): Oxford University Press; 2020.
2. Campbell CS. Mortal Responsibilities: Bioethics and Medical-Assisted Dying Yale J Biol Med. 2019 Dec 20;92(4):733-739.
3. Luigi Coppola , Alessandra Cianflone , Anna Maria Grimaldi , Mariarosaria Incoronato , Paolo Bevilacqua , Francesco Messina , Simona Baselice , Andrea Soricelli , Peppino Mirabelli , Marco Salvatore Biobanking in health care: evolution and future directions J Transl Med . 2019 May 22;17(1):172.
4. George Khushf, Handbook of Bioethics [electronic resource] HEAL-Link Springer ebooks. Eudoxus book code : 73268774
5. Henk A.M.J. ten Have / Bert Gordijn, Handbook of Global Bioethics [electronic resource] HEAL-Link Springer ebooks. Eudoxus book code : 73240319

3rd Semester Courses

APPLICATIONS OF INFORMATICS IN BIO-MEDICAL SCIENCES

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-	**SEMESTER**	**3nd**

	190302		
COURSE TITLE	**APPLICATIONS OF INFORMATICS IN BIO-MEDICAL SCIENCES**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
	Lectures (Theory)	4	4
	Total	4	4
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General Knowledge Course, Compulsory Course		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=4669, http://www.mls.teithe.gr		

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Purpose and Objectives of the Course

The Course includes basic knowledge of bioinformatics and the use of online databases of structure and sequence of proteins, nucleic acids, biological activity of biomolecules, etc.

The purpose of the course is for the student to get to know the general and special databases that exist and probable applications in the field of Biomedical Sciences. In addition, the students learn the online data processing tools that exist and their use and learn to apply the most important of them.

The course also deals with new information and communication technologies of the health sector (ICT). Extensive reference is made both to the use of ICT to improve health services and patient care, and to methods of saving resources and increasing productivity through ICT. A description of the developments occurring in the field of ICT that affect the health sector is attempted, such as telemedicine applications, computerization of hospitals, systems of automatic consultation and assistance of consultation.

Upon completion of the course, students are expected to have acquired:

Knowledge

-The students will know available protein and nucleic acid structure databases and tools for probable applications. Databases of biological action of molecules and probable applications.

Online biomolecule interaction prediction programs etc.
In addition, at the end of the course the student will:
-They will gain a broad insight into the impact of new technologies on the health sector and the applications and solutions offered
-They will be able to recognize the most basic technological terms in the health field and realize the contribution of new technologies to the improvement of the provision of health services.

Skills
Specifically for proteins the students will be able to:
a) Find the amino acid sequence using PubMed protein or Uniprot
b) To find the tertiary conformation (3D structure) of the protein through PubMed structure
c) To compare the amino acid sequence of the protein with the amino acid sequence of other proteins through BLASTp (NCBI) or Uniprot BLAST (SIB)
d) To compare the three-dimensional structure of a protein with the three-dimensional structure of another protein through the RCSB protein alignment tool.
e) To find the nucleotide sequence of the gene / mRNA for this protein.
F) Compare the DNA sequence with other sequences (eg BLAST) and to find sequences that show similarity.
g) Use the PubMed gene database (NCBI)
to find:
-Synonyms of the protein, if any
-On which chromosome is the gene (genomic context)
-In which tissues is it expressed? (expression)
-References to protein functionality (Gene References into Functions)
-Bbiomolecules with which it interacts (Interactions)
-Evidence for the subcellular distribution of the molecule (localization / component)
Associated disorders and Diseases (if any) (Human Protein Reference Data Base/Diseases)
h) Search for glycosylation sites through Uniprot base and linked Glyconnect base etc.
i) The student will also be able to find information about an enzyme using ExPASy's ENZYME application, BRENDA and PROSITE databases.
Using BRENDA they will be able to answer the questions:
- What is the EC code of the enzyme
- By what names or abbreviations is it known? (SYNONYMS)
- Which reaction/s does it catalyze? (REACTION)
- To find the metabolic pathways in which it participates (PATHWAYS)
- To find the substrates of the enzyme
- To find the organisms in which the existence of the enzyme has been reported
- To find he coenzyme(s) it uses, if any
- To find if it is activated by metal ions and which ones
- Enzyme inhibitors and activators, if present
- Diseases associated with the enzyme
- The Km of the enzyme for each substrate and the optimal pH of action
- Temperature resistance
-The tissues in which the enzyme was detected
- the subcellular distribution of the enzyme
- Enzyme applications.

Students learn to use prediction tools to:
j) Predict glycosylation sites and glycosylated protein structure through the online Programs NetNGlyc 1.0, GlyProt etc.
k) Protein interaction prediction
l) 3D structure prediction from the amino acid sequence through the Predict Protein Swiss Model.
m) Prediction of small compound biological activity using online structure-comparison programs based on the structure-comparison with molecules of known biological activity e.g. PASS
n) Prediction of biological action e.g. enzyme inhibition using stable complex formation prediction programs (Docking).
ξ) Prediction of acute toxicity and ecotoxicity with online structure comparison programs such

as PASS-GUSAR.

Competence
At the end of the course,
-the students should understand how the various available databases and tools can be used to answer questions in the Biomedical Sector.
-at the end of the course, the students should understand how technological developments can help scientists working in the field, recognizes the benefits of the "exploitation" of information technology and telecommunications in the field of health
-understands the problems to be addressed at the user level
-understands the problems faced by a computer scientist designing a medical informatics system
-will be familiar and up-to-date with the latest developments in the field of medical informatics
-will be able to actively participate in the broader medical informatics support team
-will obtain a comprehensive picture of the issues related to the subject of medical informatics and e-health in general
-will be aware of the current situation at the global level and the developments taking place in the subjects of medical informatics.
-will know where research is headed and what is expected in the near future in relation to the health sector and new technologies both at the patient and health professional level.
-Finally, he will learn to use basic Windows applications to deal with basic data presentation and processing needs.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working independently
Team work
Adapting to new situations
Decision-making
Working in an interdisciplinary environment
Production of new research ideas
Working in an international environment
Working in an interdisciplinary environment
Criticism and self-criticism

3) SYLLABUS

In particular, the course includes:
-Introduction to general and specific online databases and the application of data utilization programs.

- **Exploring the PubMed - NCBI database and its capabilities**

Search for publications, categories of articles and other material: research articles, reviews, systematic review, meta-analysis etc.

- **Connections with other databases**

Special bases (protein, structure, gene, nucleotide etc.)

- **Exploring the Swiss Institute of Bioinformatics (SIB)**

Special bases (Enzyme information base BRENDA, UniPro, ExPaSy, PASS etc.)

- **Data processing and utilization capabilities**

Data Processing Tools

BLAST – protein: Amino acid sequence comparison of two or more proteins
BLAST – nucleic acids: Base sequence comparison
3D structure alignment: Comparison of three-dimensional protein structure
Translation tools

Prdiction Tools

Prediction of protein glycosylation sites
Prediction of protein phosphorylation sites
Protein three-dimensional structure (tertiary structure) prediction from amino acid sequence
Protein interaction prediction
Prediction of Protein interaction with small molecules
Prediction of pharmaceutical/biological activity of small molecules
Small molecule toxicity prediction

- Introduction to the basics of computers. Operating Systems. IT applications in word processing, database creation, record keeping, exploiting excel capabilities in data processing.
– Computer applications in medicine and especially in the medical laboratory.

Study of communication systems and online connection of laboratories and Hospitals. Introductory concepts and reference to the health system. Presenting the picture regarding the adoption, assimilation, and influence of new technologies in its overall operation and the quality of services provided in all directions. ICT in the field of health. Information Systems in Health. Telemedicine (Basic concepts, definitions, applications, case studies, developments, trends, expected results, advantages, concerns, obstacles, legal issues, security issues)

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, by face to face lectures using power-point presentation of online processes presented by print-screens of the steps of each process. Where appropriate online training via zoom.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	-Use of IT and communication technologies in teaching and use of e-mail and the asynchronous education platform to communicate and inform students, respectively. -Use of e-class (moodle) for the posting and distribution of instructions, lectures, useful links, questionnaires and other information related to the course, project assignment and submission of assignments, etc. -Use of online databases and data processing programs by students in the preparation of assignments
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.*	

Activity	*Semester workload*
Lectures-Introductions using audio-visual media. Assignments/Work	120

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Presentations by students.	
	Total	120
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	• Written final exam that includes: Multiple Choice Test Short Answer Questions Assignments-Presentations	

5) ATTACHED BIBLIOGRAPHY

1. Panteleimonos Bagou, "Bioinformatics". Greek Academic Electronic Books and Aids - "Kallipos" Repository, ISBN: 978-960-603-329-2 Book Code in Eudoxus: 59303485, Edition: 1/2016 (in Greek)
2. Dimitri G. Kapopoulou, "The contribution of IT to Health", Diaulos S.A. Publications, 2nd Edition/2016, ISBN: 978-960-531-358-6) Eudoxus Code: 59365773 (in Greek)
3. I. Koumpouros, "Information and Communication Technologies & Society", New Technologies Publications, 1st edition, 2012, ISBN:978-960-6759-73-4 (in Greek)
4. "Informatics in Health". Eudox code: 683847685. Ball M. and Gold J., (2006). Banking on Health: Personal Records and Information Exchange, Journal of Healthcare Information Management, Vol.20 (2), pp.71-83.
5. Bates D.W. and Gawande A.A., Improving Safety with Information Technology, New England Journal of Medicine, 348, June 19, 2003, pp.2526–34.

3rd Semester Courses

English Medical Terminology
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE		**SEMESTER**	**3rd**
COURSE TITLE	**English Medical Terminology**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)		2	4
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	ENGLISH
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=76

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The aim of the course is the use and enrichment of vocabulary in biomedical terminology, as well as the understanding and processing of terminology texts according to the material and content of the Department's courses. The aim of the course is to develop the student's ability to analyse and understand a specialty text and to process terminology texts relevant to the courses in the program. Also, the course of English interpretation of scientific articles helps students who attend conferences and students who are preparing for postgraduate courses abroad.

Upon successful completion of the course the student will be able to:

Develop oral and written communication and translation skills through analyses of medical articles and text presentations in the classroom.
Understand and comment on specialist texts
Express ideas in a correct linguistic style and be able to handle successfully the written word with regard to terminology

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Others…
…….

Search, analysis and synthesis of data and information, using the appropriate tools and technologies
Autonomous work
Group work
Working in an international environment
Promotion of free, creative and deductive thinking

3) SYLLABUS

General Information. Definition of Biomedical Scientist / Description and editing of English terms of scientific articles. English terminology and translation of anatomy related texts. (The organs of the human body).

English terminology and interpretation of texts related to Physiology (The physiological functions of the body, First aid).

English terminology and interpretation of texts relating to medical physics, organic/inorganic chemistry.

English terminology and rendering of texts related to Biomedical Laboratory (Study of instruments used in laboratory medicine. Methods of sterilization. Laboratory safety).

English terminology and interpretation of texts relating to laboratory animalsEnglish terminology and interpretation of biochemistry-related texts (Carbohydrates, Fats, Vitamins, Vitamins, Hormones, Amino acids, Nucleic acids, Proteins, Enzymes). Clinical Chemistry (Blood Sugar, Blood Sugar, Urea, Uric Acid, Cholesterol, Triglycerides, Lipids, HDL Cholesterol, LDL Cholesterol, Transaminases, γGT, Alkaline Phosphatase, Lipids, Vitamins, Hormones, Drugs, Toxic substances).English terminology and translation of texts related to Immunology (Pathogenesis, Hypersensitivity, Tissue Damage, Antibodies, Agammaglobulinemic, Antigen-Antibody Reaction, Vaccines, Antibodies).

English terminology and performance and performance related to General Microbiology (The biochemistry and physiology of microorganisms, the viability and classification of microorganisms. Prokaryotic and eukaryotic microorganisms, Bacteria, Viruses, Fungi, Fungi, Algae, Parasites). Medical Microbiology (Morphological classification of bacteria, Isolation of micro-organisms, Methods of culture and isolation of bacteria, Culture materials, Colonies, Methods of culture and isolation of bacteria).

English terminology and translation of texts related to Molecular Biology, Biotechnology, Human Genetics.

English terminology and interpretation of texts related to Histology, Embryology, Cytology, Histopathology.

English terminology and interpretation of texts related to hematology (Origin of blood cells, Blood cell composition and morphology. Techniques in hematology. Anemias and polycythemias). Blood bank (Requirements for donor and recipient protection. Methods of blood collection. Preparation and use of plasma, Infectious agents).

English terminology and interpretation of texts relating to body fluids (Urine, CSF, Synovial fluid, Peritoneal fluid, Faeces, Sperm).

Computer terminology.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Lectures and presentations using audio-visual media. Linguistic exercises in English terminology on the topics mentioned above and translations of scientific articles.	
TEACHING METHODS	***Activity***	***Semester workload***

The manner and methods of teaching are described in detail. *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	Lectures	100
	Writing a project	20
	Course total	120
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Final written examination with translation of a Greek scientific text Written assignment Public presentation	

5) ATTACHED BIBLIOGRAPHY

Allan David, Lockyer Karen – Αγγλική Ορολογία στις Βιοϊατρικές Επιστήμες (2018), BROKEN HILL PUBLISHERS LTD, ISBN: 9789925563623

SUSAN M. TURLEY MEDICAL LANGUAGE-ΑΓΓΛΙΚΗ ΟΡΟΛΟΓΙΑ ΓΙΑ ΤΙΣ ΕΠΙΣΤΗΜΕΣ ΥΓΕΙΑΣ (2020), εκδ. ΙΩΑΝΝΗΣ ΚΩΝΣΤΑΝΤΑΡΑΣ, ISBN: 9789606080593

3.4. 3rd Semester Courses

Blood Drawing Techniques

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285190304	**SEMESTER**	**3rd**
COURSE TITLE	**Blood drawing techniques**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Laboratory (Practice work)	3	4

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background course, Compulsory
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3620 https://exams-phym.the.ihu.gr/course/view.php?id=52

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. **Knowledge**
   To understand and plan the procedure of phlebotomy
   To understand the different methods of venipuncture (syringe, vacum tube, butterfly needle)
   To recognize the personal safety equipment
   To determine patient's preparation for laboratory tests
   To recognize the possible hazards during or after venipuncture.
   To learn sample transportation storage conditions

2. **Skills**
   To identify patient's vein for phlebotomy
   To develop the skill of blood drawing
   To apply the correct use of personal protective equipment
   To choose the appropriate test tube and anticoagulant for each laboratory test.
   To overcome hazards during or after venipuncture

3. **Competence**
   To perform venipuncture independently
   To be able to use new methods and techniques of phlebotomy
   To be able to present venipuncture procedure to groups of first year students
   To organize a phlebotomy room

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary	*Project planning and management* *Respect for difference and multiculturalism*

technology *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Respect for the natural environment* *Showing social, professional and ethical responsibility* *and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*
Working independently Team work Working in an international environment Working in an interdisciplinary environment Project planning and management Showing social, professional and ethical responsibility Adapting to new situations Decision-making	

3) SYLLABUS

- knowledge of appropriate supplies and protective equipment
- methods of disifenction
- patients' preparation
- selection of the anatomical insertion site for phlebotomy
- venipuncture procedure using needle, butterfly needle or vacum tube
- use of recommended laboratory collection tubes
- sample transportation
- storage conditions

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In the classroom, face to face.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Basic software (windows, word, power point, the web, etc.).
Support of learning process through the electronic platform / e-class</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>20</td></tr>
<tr><td>Practice work in groups</td><td>40</td></tr>
<tr><td>Venipuncture procedure practice</td><td>60</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>120</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions,</td><td>1.Evaluation of phlebotomy technique in the weekly group practice work (Graded and gives 10% to the final grade)

2.Final Venipuncture performing (Graded and gives 40% to</td></tr>
</table>

problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	the final grade) 3.Written final exam may include: - Multiple Choice questionnaire - Short answer questions (Graded and gives 50% to the final grade)

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Εργαστηριακή Προσέγγιση στη Γενική Αίματος Ευαγγελία Παντζιαρέλα, Απόστολος Κραλίδης Εκδόσεις Άγγελος Αθ. Αλτιντζής Ε.Ε
2. Τεχνικές λήψης βιολογικών υλικών, Κριεμπάρδης Αναστάσιος Εκδόσεις Λαγός Δημήτριος

B. English

1. Michael Cornes , Mercedes Ibarz , Helene Ivanov , Kjell Grankvist, Blood sampling guidelines with focus on patient safety and identification - a review. Diagnosis 2019 Mar 26;6(1):33-37.
2. Simundic AM, Church S, Cornes MP, Grankvist K, Lippi G, Nybo M, Nikolac N, van Dongen-Lases E, Eker P, Kovalevskaya S, Kristensen GB, Sprongl L, Sumarac Z, Compliance of blood sampling procedures with the CLSI H3-A6 guidelines: An observational study by the European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) working group for the preanalytical phase (WG-PRE).Clin Chem Lab Med. 2015 Aug;53(9):1321-31. doi: 10.1515/cclm-2014-1053.PMID: 25536667
3. Cristiano Ialongo , Sergio Bernardini, Phlebotomy, a bridge between laboratory and patient. Biochem Med (Zagreb), 2016;26(1):17-33.

3.5 3rd Semester Courses

NUTRIENT SUBSTRATES

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1903051 285-1903052	SEMESTER	3rd
COURSE TITLE	**NUTRIENT SUBSTRATES**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g., lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Theory	3	4
Tutorial	1	1
Laboratory practice	1	2
	5	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Special background course, Compulsory Course
PREREQUISITE COURSES:	NO

LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3621, https://moodle.teithe.gr/course/view.php?id=3622, http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.
Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To describe the basic nutrient substrates and the nutrients they contain
- To know the biochemical mechanisms that govern the interaction of the chemical components of nutrient substrates in the growth of bacteria.
- To know the selective and special nutrient substrates and where they are used.
- To know the type of nutrient substrate and the type of bacteria that grows in it.
- To describe the ingredients used and the methods of preparation of the nutrient substrates.
- To describe sterilization and the methods of sterilization, sterilization of nutrient materials, sterilization with dry heat. Knowledge of aseptic technique during microbiological analysis.

2. Skills

- To prepare common, enriched and special nutrient substrates.
- To fully understand the method of preparation, sterilization and sterility control of nutrient substrates.
- To apply quality control to basic (common), enriched, selective and special nutrient substrates.
- To apply nutrient sterilization and carry out dry heat sterilization.
- To apply aseptic technique during microbiological analysis.
- To recognize the relevant terminology and the internationally used abbreviations of the nutrients from which the nutrient substrates are prepared.
- To apply personnel and environmental protection principles using laboratory safety regulations.

3. Competence

- To assess the correct execution of the nutrient substrates.
- To be able to present using new technologies assignments-experiments to groups of first-year students or to groups of secondary school students.
- To develop critical thinking and ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.
- To qualitatively evaluate the methods of preparation of nutrient substrates.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility and sensitivity to gender issues
Decision-making	Criticism and self-criticism
Working independently	Production of free, creative and inductive thinking
Team work	……
Working in an international environment	Others…
Working in an interdisciplinary environment	…….
Production of new research ideas	

- Search, analysis and synthesis of data and information, using the necessary technologies
- Working independently
- Teamwork
- Work in an interdisciplinary environment
- Work in an international environment
- Production of new research ideas

3) SYLLABUS

THEORY

- Classification, biochemical properties of the substances and components used in nutrient substrates for the growth and study of the properties of bacteria.
- Quality control and maintenance of basic, enriched, selective and special nutrient substrates.

LABORATORY

- Laboratory exercises are carried out in a laboratory.
- Introduction to the study of bacteria.
- Microbiology Laboratory Equipment. Principles of Laboratory Safety, Methods used for the preparation of nutrient substrates, their sterilization and the sterility control of materials.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the Microbiology lab room, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	• Lectures and tutorials using audio-visual media, both in the theoretical and in the laboratory part. • Use of the e-mail and the Department's website to communicate and inform students, respectively. • Use of the e-class (moodle.teithe.gr) for the posting and circulation of scientific articles, lectures, useful links, anatomical images, questionnaires, information for attending conferences and seminars related to the course, etc.
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Activity / Semester workload Lectures: 120 Laboratory practice: 40 Tutorial: 40 Course total: 210
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria	Theory 1. Written Assignment optional with public presentation (Graded and gives 20% to the final grade of the final theory exam). 2. Written final exam including: ✓ Assay questions type ✓ Multiple Choice questions ✓ Short Answer questions Note: (1) is carried out as long as the circumstances allow it, such as the number of students, the workload of teachers, etc. Laboratory 1. Assessment of students with theoretical and practical exercises in the laboratory (Not graded). 2. Weekly exercises and assignments submitted daily (Not graded).

are given, and if and where they are accessible to students.	3. Mid-term exam – Progress to the Laboratory exercises section (in case of a successful exam, possibility of exemption from part of the material in the final exams) 4. Written/ oral final exam with multiple choice questions, short answer questions and case study Note: (2) and (3) are carried out as long as the conditions allow, such as the number of students, the workload of teachers, etc. The mid-term exam (4) may not take place, depending on the special circumstances of the semester. Total course grade: Theory grade 60% + Lab grade 40%

5) ATTACHED BIBLIOGRAPHY

A. Greek
1. Σκεπαστιανός Π, Καραμητρούσης Ε. Θρεπτικά υποστρώματα και μεταβολισμός μικροοργανισμών. Εκδόσεις University Studio Press. 2016 Εύδοξος 22771065
2. Ανδρεάδης Γ. Σημειώσεις θρεπτικών υποστρωμάτων. Ηλεκτρονικό σύστημα του ΑΤΕΙΘ
3. Murray P, Rosenthal K, Pfealler M. ΙΑΤΡΙΚΗ ΜΙΚΡΟΒΙΟΛΟΓΙΑ (Ελληνική Έκδοση). Εκδόσεις Παρισιάνου. Αθήνα, 2012.
4. Greenwood D, Slac kR, Peutherer J, Barer M. ΙΑΤΡΙΚΗ ΜΙΚΡΟΒΙΟΛΟΓΙΑ. (Ελληνική Έκδοση). Εκδόσεις Πασχαλίδης Π.Χ. Αθήνα, 2012.
5. Πόγγας Νικόλαος, Χαρβάλου Αικατερίνη. ΙΑΤΡΙΚΗ ΜΙΚΡΟΒΙΟΛΟΓΙΑ. Εκδόσεις ΟΔΥΣΣΕΑΣ. Αθήνα, 2011.

B. English
1. Murray P, Rosenthal K, Pfealler M. Medical Microbiology. 7 edition Elsevier 2012.
2. Mark Gladwin, William Trattler, C.Scott Mahan. Clinical Microbiology Made Ridiculously Simple. 6 edition. Medmaster 2014.
3. Warren Levinson. Review of Medical Microbiology and Immunology. 13 edition. Lange Medical Books. 2014

3.6. 3rd Semester Courses

Professional Ethics / Employment Rights
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190306	**SEMESTER**	**3rd**
COURSE TITLE	**Professional Ethics / Employment Rights**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
	Lectures (Theory)	2	2
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Compulsory, General Knowledge (GKC)		
PREREQUISITE COURSES:	NO		

LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=21 https://moodle.teithe.gr/course/view.php?id=3623

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To recognize the basic ethical principles of the Healthcare Professions
- To recognize the role of ethics and the concept of a mandatory Code of Ethics
- To describe the Guiding Principles of Ethics
- To identify the operational and procedural factors that influence the behavior of workers in the healthcare professions
- To select the specific requirements of the Code of Ethics for the Biomedical Science professionals.
- To record and classify the assessment criteria for evaluating the professional competence of workers

2. Skills

- Understand the basic principles of ethics in Healthcare Professions
- Understand and relate the operational and procedural factors that influence the behavior of workers in the health professions
- Analyze and identify the specific tasks of biomedical scientists
- Implement the commitments of a Code of Conduct
- Correlate and define the duties and responsibilities of healthcare professionals
- Recommend and develop a proposal for a Code of Conduct for Biomedical Scientists

3. Competence

- To be able to present experimental projects using new technologies to groups of first-year students or groups of secondary school students.
- To develop critical thinking and ability to identify and resolve problems, whether working alone or in groups.
- To be able to collect, summarize and analyze information, ideas, problems and their solutions in order to generate new research ideas.
- To compare and evaluate the obligations, limitations and rights of healthcare professionals
- To evaluate the professional rights, duties and responsibilities of healthcare professionals
- To compare and evaluate the development, supervision, evaluation, training and progression methods of healthcare professionals

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*
Search for, analysis and synthesis of data and information, with the use of the necessary technology Adapting to new situations Working independently Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project planning and management Respect for the natural environment	

3) SYLLABUS

1. The sociological role of work. The individual in the work environment
2. Definition of Ethics - Role of Ethics - Social dimension and evolution
3. Human rights and health
4. Code of Conduct - Binding and non-binding
5. Guiding Principles of Ethics I
6. Guiding Principles of Ethics II
7. Operational and Procedural Factors Affecting the Behaviour of Employees in the Health Professions
8. Obligations, Limitations and Rights of Health Care Professionals.
9. The Professional Responsibility of Health Care Professionals
10. Legal Framework governing the Health Professions
11. Specific Duties and Professional Rights of Biomedical Scientists
12. Special Ethical Issues in Health Care
13. Proposal for a Code of Ethics for Biomedical Scientists

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.*	

Activity	*Semester workload*
Lectures	120
Seminar	

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS		
	Course total	120
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions 2. Written Assignment, optional, with oral presentation in class (Graded and gives 10% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors.	

5) ATTACHED BIBLIOGRAPHY

A. Greek

• Ηγουμενίδης Μιχαήλ, 2020. Βασική Βιοηθική-Δεοντολογία-Νομοθεσία για Επαγγελματίες Υγείας, (Εκδότης): BROKEN HILL PUBLISHERS LTD. Κωδ. Εύδοξος [94643639]

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• Α. Κουτσελίνης, 2001. Βασικές αρχές βιοηθικής, ιατρικής δεοντολογίας και ιατρικής ευθύνης, Εκδόσεις Παρισιάνου Α.Ε.,ISBN: 978-960-340-124-2 Κωδ. Εύδοξος [41219]

B. English

• Institute of Biomedical Science, 2015. Good Professional Practice in Biomedical Science. Benchmark Series, London, UK.

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•Tom L. Beauchamp and James F. Childress, 2012.Principles of Biomedical Ethics, Oxford University Press, 480p. ISBN: 9780199924585.

3.7. 3rd Semester Courses

GENERAL PATHOLOGY

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1903071 & 285-1903072	**SEMESTER**	**3rd**
COURSE TITLE	**General Pathology – Laboratory & Theory**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	3	4
Lab Tutorial	1	
Laboratory	2	3
	6	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Compulsory, General background
PREREQUISITE COURSES:	YES 1. Basic Histology & Methods of Study - General Embryology
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=57

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To describe the basic and critical biological features of cancer and, in broad terms, the molecular mechanisms that lead to the tumor development
- To describe the factors involved in carcinogenesis
- To describe the clinical and epidemiological features of neoplasms in humans
- To describe the mechanisms of immunity, immune system functions, hypersensitivity reactions and diseases of the immune system
- To describe the responses of cells and tissues to a variety of damaging agents

- To describe pathological conditions such as necrosis and apoptosis
- To describe the causes, mechanisms of disease development and responses to cellular damage
- To recognise the phenomenon of inflammation and specific forms of inflammation
- To describe the histological techniques in GP (fixation, processing, microtomy, tissue sections staining)

2. Skills

- Understand the principles of histological technique and the individual stages of the histological technique (macroscopic examination, fixation, tissue embedding, microtomy, Hematoxylin/Eosin staining) as well as with the interpretation and evaluation of the results of the histological technique
- To provide information on the correct procedure for the specimen receipt, identification, transport and storage of biological materials in the Pathology Laboratory (PI)
- Apply principles of personal protection, personnel protection and the environment from biological, physical and chemical hazards in PI
- Apply and modify protocols and steps of the histological technique for optimal results of the histological technique
- To microscopically examine slides stained with Hematoxylin/Eosin, interpret and evaluate the results of the histological technique

3. Competence

- To be able to present using new technologies tasks-experiments to groups of first year students or groups of secondary school students.
- To develop critical thinking and the ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyze, information, ideas, problems and solutions in order to generate new research ideas.
- To decide on the best provision of First Aid in the laboratory

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

3) SYLLABUS

THEORY

Introduction to Anatomic Pathology (General & Systematic). Branches of Pathology. Laboratory Methods with Application to Anatomic Pathology. Diseases (Characteristics - Classification - Incidence). Acquired disorders of Growth and Differentiation. Reactions to Cellular Damage. Repair - Regeneration - Healing - Ischemia - Thrombosis - Infarct - Shock. Inflammation. Carcinogenesis and Neoplasms (General characteristics -Nomenclature-Classification-Biological behaviour). Immunopathology, Immunity, Hypersensitivity Reactions, Immunological Deficiencies. Ageing, Death

LABORATORY

Organization - Operation of Pathologic Laboratory (PL) / Archiving, storage of produced PL products / PL waste management / Quality Control and Standardization / Accreditation / Quality Assurance / Safety. Receiving surgical preparations, endoscopic and non-endoscopic biopsies, biological fluids, materials for special laboratory techniques - Macroscopic examination. Fixation - Fixating solutions. Tissue preparation for paraffin embedding - Tissue embedding. Microtomy - Errors / Causes of microtomy errors. Staining of histological sections - Histochemical staining / Haematoxylin & Eosin (H&E) staining - Preparation of H&E staining solutions / H&E staining protocols. Frozen section

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	

Activity	***Semester workload***
Lectures	120
Laboratory	80
Course total	200

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	**Theory** 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions 2. Written Assignment, optional, with oral presentation in class (Graded and gives 20% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors. **Laboratory** 1. Daily assessment of students with theoretical and practical exercises in the laboratory (not graded). 2. Weekly exercises and assignments submitted daily (Not

	graded). 3. Written/oral final examination with multiple choice questionnaire, short answer questions and case study questions. Note: (2), (3) are carried out if the circumstances such as number of students, workload of teachers etc. allow. Total course grade: Theory grade 60% + Laboratory grade 40%.

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Underwood J.C.E. Γενική και Συστηματική Παθολογική Ανατομική (5η Ελληνική Έκδοση). Εκδόσεις Παρισιάνου, 2011
2. Kantarjian, H., Wolff R., Koller C. Ιατρική Ογκολογία (1η Έκδοση). Εκδόσεις Παρισιάνου, 2015
3. Kumar V., Abbas A.K., Aster J.C. Robbins Βασική Παθολογική Ανατομική (9η Ελληνική Έκδοση). Εκδόσεις Παρισιάνου, 2016.
4. Kumar V., Abbas A.K., Fausto N. Robbins & Cotran. Παθολογοανατομική Βάση των Νοσημάτων με στοιχεία Παθογένειας (1η Ελληνική Έκδοση). Εκδόσεις ΠΧ Πασχαλίδης, 2008.
5. Rubin E. Βασική Παθολογική Ανατομική. Τόμος Ι –ΙΙ. (1η Ελληνική Έκδοση). Εκδόσεις Πασχαλίδης, 2010.
6. Ε. Σιβρίδης. Παθολογική Ανατομική. (3η έκδοση). Ακαδημαϊκές Εκδόσεις, 2018.

B. English

1. Suvarna S.K., Layton C., Bancroft J. D. Bancroft's Theory and Practice of Histological Techniques. (8th Edition). Churchill Livingstone Elsevier, 2019.
2. Kumar V., Abbas A.K., Aster JC, Turner JR. ROBBINS & COTRAN PATHOLOGIC BASIS OF DISEASE. 10th Edition. Elsevier, 2021.

4.1. 4th Semester Courses

HUMAN PHYSIOLOGY
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190401	SEMESTER	4th
COURSE TITLE	HUMAN PHYSIOLOGY		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		WEEKLY TEACHING HOURS	CREDITS
Theory		3	3
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE general background, special background, specialised general knowledge, skills development	General Background Course, Compulsory Course		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS			
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3659, http://www.mls.teithe.gr		

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- General principles of substance exchange
- Physiological functions and homeostatic mechanisms of body systems (nervous, circulatory, respiratory, digestive, reproductive, urinary, endocrine)
- Possible physiological disturbances at the levels of cell, tissue, organ and system and their association with various diseases

2. Skills

- The physiological functions and homeostatic mechanisms of the human body systems.
- The relationship and complex interactions between organs and body organ systems
- The clinical connection of the knowledge of physiology with clinical medical practice and the understanding of the pathophysiology of common medical diseases
- To process complex problems related to pathophysiological conditions.

3. Competence

- Ability to understand topics related to specific topics of Human Pathophysiology
- Ability to search scientific literature on Physiology topics in organized databases such as PubMed, Scopus
- Ability to generate new research ideas and collaborate with team members.
- Scientific presentation skills.
- Application of academic knowledge in clinical practice

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Production of free, creative and inductive thinking

3) SYLLABUS

- Basic principles of the functions of the human body,
- Homeostasis of human body, cell communication
- General and Cell physiology
- Physiology of human body systems (Respiratory system, Circulatory system, Blood and its functions, Lymphatic system, Urinary system Organization and functions of Central and Peripheral Nervous system, Neurophysiology. - Skeletal Muscle system. Endocrine system function-role of hormones Digestive system. Metabolism. Sensory system function (visual, auditory)

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Basic software (windows, word, power point, the web,

<table>
<tr><td>Use of ICT in teaching, laboratory education, communication with students</td><td>etc.).
Support of learning process through the electronic platform / e-class. Use of the moodle e-learning platform in order to upload scientific articles, instructions, lectures, useful links, questionnaires, information for attending conferences and seminars related to the course, etc.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td><table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>90</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Written final exam may include:
- Multiple Choice questionnaire
- Short answer questions</td></tr>
</table>

5) SUGGGESTED LITERATURE

1. Βιβλίο [77107185]: Ιατρική Φυσιολογία-Κυτταρική και Μοριακή Προσέγγιση 2η έκδοση, Boron F. Walter, Boulpaep L. Emile Λεπτομέρειες
2. Βιβλίο [41959951]: Εισαγωγή στη Φυσιολογία του ανθρώπου, Lauralee Sherwood Λεπτομέρειες
3. Βιβλίο [59392713]: Φυσιολογία του ανθρώπου (2η έκδοση), Βαρσαμίδης Κωνσταντίνος Λεπτομέρειες
4. Βιβλίο [112692571]: Φυσιολογία ανθρωπίνου σώματος, 2η έκδοση, Αλμπάνη Μαρία, Βενετίκου Μαρία, Παπαλιάγκας Βασίλειος, Σπάνδου Ευαγγελία, Επιμ. Αλμπάνη Μαρία

4.2 4th Semester Courses

MEDICAL MICROBIOLOGY I (IDENTIFICATION OF BACTERIA)
COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1904021 285-1904022	SEMESTER	4th
COURSE TITLE	MEDICAL MICROBIOLOGY I (IDENTIFICATION OF BACTERIA)		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g., lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Theory	3	4
Tutorial	2	1
Laboratory practice	1	1
	6	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Course
PREREQUISITE COURSES:	General Microbiology
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3660, http://www.mls.teithe.gr

(2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.
Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To know all bacteria of medical importance, their ecology and epidemiology, modes of transmission, pathogenicity and the infections they cause.
- To describe the structure, functions of the pathogenic bacteria, their pathogenic effect and methods of prevention.
- To know the antigenic, biochemical properties of bacteria and how to cultivate them.
- To describe the laboratory methods of classical and modern Microbiology, as well as their application in the diagnosis of bacterial infections.
- To describe the metabolism of bacteria, their microbial growth and culture requirements.
- To know the classification of microorganisms and their identification and classification methods.
- To describe the stains used to differentiate bacteria and classify them.
- To describe the identification tests for bacteria.

2. Skills

- To apply culture techniques for the isolation, detection and identification of bacteria.
- To easily perform Staining (Simple, Gram, Acid Resistant).
- To easily perform identification techniques of Gram (-) bacteria and Gram (+) grains.
- To apply antibiotic sensitivity control techniques of pathogenic bacteria.
- To fully understand the organization and operation of a Clinical Microbiology Laboratory.
- To apply principles of personal and environmental protection from bacteria.

3. Competence

- To qualitatively assess the results of the diagnostic tests used in bacterial infections.
- To fully understand the relevant terminology and internationally used abbreviations in diagnostic orders for the diagnosis of bacterial diseases.
- To be able to present using new technologies assignments-experiments to groups of first-year students or to groups of secondary school students.
- To develop critical thinking and ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations Decision-making	Showing social, professional and ethical responsibility and sensitivity to gender issues
Working independently Team work	Criticism and self-criticism Production of free, creative and inductive thinking
Working in an international environment Working in an interdisciplinary environment	…… Others…
Production of new research ideas	…….

- Search, analysis and synthesis of data and information, using the necessary technologies
- Working independently
- Teamwork
- Work in an interdisciplinary environment
- Work in an international environment
- Production of new research ideas

(3) SYLLABUS

THEORY

- Nomenclature and Classification of Bacteria
- The normal human microbial flora
- Morphology - Characteristic properties - Pathogenic action of:

Gram (+) Bacteria:

- *Staphylococcus*
- Strepococci - Enterococci
- Corynobacteria
- Listieria
- *Bacillus*
- Clostridium
- Mycobacteria

Gram (-) Bacteria:

- Naisserias
- Enterobacteria
- Pseudomonas
- Campylobacteria
- Haemophilus
- Brucellas
- Legionelles
- Bordenelles
- Donakia
- Treponemae

LABORATORY

- Laboratory investigation of pathogens. Cultivation - Identification techniques of pathogen
- Gram staining. Preparation, fixation, staining and microscopy of preparation.
- Ziehl-Neelsen staining. Preparation, fixation, staining and microscopy of preparation.
- Cultivation (inoculation and coating) of biological fluids and secretions in nutrient substrates.
- Colony study. Identification of bacteria.
- Identification of staphylococci (APIstaph). Catalase & coagulase assay (free & bound), mannitol fermentation (Chapman agar).
- Identification of streptococci, catalase test, α, β, γ hemolysis, bacitracin-SXT test, optochin test.
- Pseudomonad, oxidase assay.
- Enterobacterials. Identification systems, IMViC in tubes, motility test, Klingler agar, API, enterotube, enterosystem, enteropluri)

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the Microbiology lab room, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	• Lectures and tutorials using audio-visual media, both in the theoretical and in the laboratory part. • Use of the e-mail and the Department's website to communicate and inform students respectively. • Use of the e-class (moodle.teithe.gr) for the posting and circulation of scientific articles, instructions, lectures, useful links, anatomical images, questionnaires, information for attending conferences and seminars related to the course, etc.
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Activity / Semester workload Lectures: 90 Laboratory practice: 30 Tutorial: 30 Course total: 180
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, assay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Theory 1. Written Assignment optional with public presentation (Graded and gives 20% to the final grade of the final theory exam). 2. Written final exam including: ✓ Assay questions type ✓ Multiple Choice questions ✓ Short Answer questions Note: (1) is carried out as long as the circumstances allow it, such as the number of students, the workload of teachers, etc. Laboratory 1. Assessment of students with theoretical and practical exercises in the laboratory (Not graded). 2. Weekly exercises and assignments submitted daily (Not graded). 3. Mid-term exam to the laboratory exercises section (in case of a successful exam, possibility of exemption from part of the material in the final exams) 4. Written/ oral final exam with multiple choice questions, short answer questions and case study questions Note: (2) and (3) are carried out as long as the conditions allow, such as the number of students, the workload of teachers, etc. The midterm exam (4) may not take place, depending on the special circumstances of the semester.

	Total course grade: Theory grade 60% + Lab grade 40%

(5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Παπαπαναγιώτου Ι., Κυριαζοπούλου – Δαλαΐνα Β. Εισαγωγή Στην Ιατρική Μικροβιολογία, Ιολογία Και Ανοσολογία, (ΕΥΔΟΞΟΣ: Βιβλίο [17228])
2. Cedric A. Playfair Jet al Μικροβιολογία ΕΥΔΟΞΟΣ 13256559
3. Διδακτικές σημειώσεις σε ηλεκτρονική μορφή (power point), Σκεπαστιανός Πέτρος (Θεωρία & Εργαστήριο).
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6. Greenwood D, Slack R, Peutherer J, Barer M. ΙΑΤΡΙΚΗ ΜΙΚΡΟΒΙΟΛΟΓΙΑ. (Ελληνική Έκδοση). Εκδόσεις Πασχαλίδης Π.Χ. Αθήνα, 2012.
7. Koneman's. Διαγνωστική Μικροβιολογία. Λίτσας , 2011
8. Αρσένη Α. Κλινική Μικροβιολογία και Εργαστηριακή Διάγνωση Λοιμώξεων, Ζήτα, 1994

B. English

1. Murray P, Rosenthal K, Pfaller M. Medical Microbiology. 7 edition Elsevier 2012.
2. Mark Gladwin, William Trattler, C. Scott Mahan. Clinical Microbiology Made Ridiculously Simple. 6 edition. Medmaster 2014.
3. Warren Levinson. Review of Medical Microbiology and Immunology. 13th edition. Lange Medical Books. 2014
4. Baron E.J, Jorgensen, J.H, Pfaller M. Manual of Clinical Microbiology, ASM Press, 10th edition, 2011
5. Bailey and Scott's. Diagnostic Microbiology. Mosby 11th edition

4.3. 4th Semester Courses

Urine and Biological Fluids Analysis (Clinical Chemistry I)
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1904031 285-1904032	**SEMESTER**	**4th**
COURSE TITLE	Urine and Biological Fluid Analysis		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	3	3
Laboratory	2	2
	5	5
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail in (d).		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	Specialty Course, Compulsory Course

PREREQUISITE COURSES:	Chemistry
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills, and competencies of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for Writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

The course aims to enable students to:
- understand renal function and the factors that influence
- apply its control techniques,
- combine and evaluate the technical part of the methods used for their determination in laboratory practice.
- apply methods of measuring and determining amino acid concentrations that help in the detection of metabolic diseases
- be able to evaluate the results of a general urinalysis and evaluate the technical part of the determination methods in laboratory practice.
- Understand the functions of other biological fluids such as gastric CSF, saliva, sweat, pericardial, lateral, and ascetic fluid and amniotic fluid
- know the biochemical indicators and their importance in the above biological fluids.
- Know, apply, calculate, and compare the diagnostic methods used in all biological fluids

2. Skills

At the end of the course, the student should be able:
- To fill in the patient's protocol, and to know the ways of collecting a sample of urine and other biological fluids.
-To know everything related to the preservation of the urine sample, CSF, gastric fluid, sputum, saliva, side, peritoneal, ascites, semen, and amniotic fluid.
- To get to know biomolecule determination techniques and how to check the reliability of the results to be delivered
-To be able to perform any test requested regarding an analysis of urine and the above biological fluids.
At the same time, he familiarizes himself

3. Competence

The purpose of the course is
- to familiarize students with laboratory techniques, such as spectrophotometry, microscopy, and the biochemical analyzer

- to present the techniques of separation and determination of substances.

General Competences

Taking into consideration the general competencies that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional, and ethical responsibility and sensitivity to gender issues*
Teamwork	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative, and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search, analysis and synthesis of data and information, using the necessary technologies
Autonomous work
Teamwork
Work in an interdisciplinary environment
Work in an international environment
Generating new research ideas

3) SYLLABUS

Theory
Includes elements of kidney anatomy, Renal Surgery, and Hormonal testing of kidney function (study of hormones that regulate kidney function). Urine analyses, concerning the general urine, such as control of reducing substances, glucose, ketone bodies, proteins, bilirubin, hemoglobin, calcium, leukocyte esterase, and ascorbic acid. Also, the microscopy of urine and study of red blood cells, pyoglobules, crystals, cylinders, and epithelial cells. Urine enzyme determinations.
For each analysis, the diagnostic value, normal values, drugs, or other substances that may give false results are indicated.
Control of metabolic diseases in the urine
Analyzes of other biological fluids: Collection, preservation, and analysis of biological fluids, such as cerebrospinal fluid, gastric fluid, sputum, synovial fluid, pleural, peritoneal, ascitic, amniotic fluid, and semen. For each biological fluid, the reception of the fluid, the analysis of the fluid, its composition, the biochemical control of the fluid, the clinical significance of the fluid, and the physiological values of the biomolecules are reported.

Laboratory
Laboratory control of glucose, fructose, pentose reducing substances in urine
Laboratory control of ketone bodies, urine albumin. Laboratory testing of hemoglobin and bilirubin. Comparison of different techniques. Determinations of general urinalysis. Determination of microscopic analysis of urine. Determination of GFR. Determination of amino acids in urine. CSF biochemical control. Collection and biochemical determinations in saliva. Biochemical tests of gastric fluid and determination of acidity. Determination of biomolecules in dihydrates and their separation from exudates. Biochemical determinations in amniotic fluid in semen. Saliva collection and biochemical testing. Synovial fluid analysis.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, and communication with students*	Basic software (windows, word, PowerPoint, the web, etc.). Support of the learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem-solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions 2. Written Assignment,optional, withoral presentation in class (Graded and gives 10% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, the workload of professors, and other factors.

Activity	***Semester workload***
Lectures	100
Laboratory (practice works)	50
Course total	150

5) ATTACHED BIBLIOGRAPHY

Α. Ελληνική

1. Λυμπεράκη Ευγενία. Κλινική Χημεία Ανάλυση ούρων και άλλων βιολογικών υγρών κωδικός βιβλίου στον Εύδοξο 22768511, έκδοση 1η έκδ./2012, διαθέτης (Εκδότης) BROKENΑΛΤΙΝΤΖΗΣ
2. Κλινική Βιοχημεία κωδικός βιβλίου στον Εύδοξο 42049, έκδοση 4η έκδ.2010, συγγραφείς GawAllan, CowanRobertA., O'ReillyDennisS. J., Stewart MichaelJ., Shepherd James, διαθέτης (Εκδότης) ΠΑΡΙΣΙΑΝΟΥ ΑΝΩΝΥΜΗ ΕΚΔΟΤΙΚΗ ΕΙΣΑΓΩΓΙΚΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΙΑ ΕΠΙΣΤΗΜΟΝΙΚΩΝ ΒΙΒΛΙΩΝ
3. Κλινική χημεία. MarshallW, BangertS. Κωδικός Ευδόξου: 13256565. Εκδόσεις BrokenHillPublishersLtd 2000
4. Εξειδικευμένα μαθήματα κλινικήςχημείας, ΠλαγεράςΠ, ΠαπαιωάννουΑ, ΕκδόσειςBrokenHillPublishersLtd 2012
5. Lecturenotes στη Κλινική βιοχημεία, Κωδικός Ευδόξου: 22768511. Εκδόσεις Παρισιάνος 2010.
6. Βασική Ιατρική Βιοχημεία του Marks: Μία κλινική προσέγγιση. LiebermanM, MarksA. ΚωδικόςΕυδόξου: 41959378. Εκδόσεις Παρισιάνος 2014.
7 .Καρκαλούσος Π, Εργαστηριακές ασκήσεις κλινικής χημείας
8. Βιοχημεία Stryer. Μετάφραση στα Ελληνικά
9. Εργαστήριο Κλινικής Χημείας Ι (Ανάλυση ούρων) Σύγγραμμα Ιωάννης Ιωαννίδης

Β. Ξενόγλωσση

1. ΒιοχημείαStryer (6ηέκδοση 2006)
2. Burtis, Carl A.; Ashwood, Edward R.; Bruns, David E. (2006). Tietz textbook of clinical chemistry (4th ed.). Saunders.

4.4 4TH Semester Courses

Hemopoiesis-Blood Physiology (Hematology I)

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1904041 285-1904042	SEMESTER	4th
COURSE TITLE	**Hemopoiesis-Blood Physiology (Hematology I)**		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		WEEKLY TEACHING HOURS	CREDITS
Tutorials (Theory)		3	4
Laboratory practice		2	2
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		5	6
COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Course		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3665 https://moodle.teithe.gr/course/view.php?id=3664 https://exams-phym.the.ihu.gr/course/view.php?id=14 https://exams-phym.the.ihu.gr/course/view.php?id=74		

2) LEARNING OUTCOMES

Learning outcomes The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. **Knowledge**
   To understand the physiology of blood cells
   To understand the automated hematology analyzers working principles

   To recognize automated hematology analyzers errors

2. **Skills**
   To apply common techniques in the hematology laboratory
   To use automated hematology analyzers
   To interpret complete blood count results
   To identify blood cells under microscope
   To recognize abbrevations used in hematology

3. Competence

To develop critical thinking and the ability to interpret hematological test results, working alone or in groups.
To be able to collect, synthesize, analyze, information, ideas, problems and solutions in order to generate new research ideas in the field of hematology.
To be able to avoid or overcome automated hematology analyzers errors in order to achieve accurate results.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility
Decision-making	and sensitivity to gender issues
Working independently	Criticism and self-criticism
Team work	Production of free, creative and inductive thinking
Working in an international environment	……
Working in an interdisciplinary environment	Others…
Production of new research ideas	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

Erythropoiesis ,erythroid cells maturation and morphology, erythrocyte membrane structure, erythrocyte metabolism,hemoglobin, hematocrite, red blood cell sedimentation rate.

White blood cells: granulocytes- lymphocytes- monocytes (morphology, production,maturation,function)

whie blood cells differential count, quantitative white blood cell disorders.

Platelets: cell morphology,production, structure.

Hematology anazers: Principles of measurement, Parameters of hematology analyzers.

Hematology analysers errors

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>120</td></tr><tr><td>Laboratory practice</td><td>60</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>180</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions Laboratory 1. Theoritical an practical exercises (non graded) 2. Written final exam may include: - Multiple Choice questionnaire - Short answer questions - Laboratory results interpretation

5) ATTACHED BIBLIOGRAPHY

A. Greek
   1. Βαγδατλή Ελένη, "Εμμορφα στοιχεία του αίματος Εκδότης: Αλτιντζής Α. Αθανάσιος
   2. Σεραφειμίδου Ουρανία, Παντζιαρέλα Ευαγγελία, "Εργαστηριακή προσέγγιση στη γενική αίματος Εκδότης: Αλτιντζής Α. Αθανάσιος
   3. Φυσιολογία και Φυσιοπαθολογία του Αίματος και των Αιμοποιητικών Οργάνων, Γ. Ηλιόπουλος Εκδότης: Πασχαλίδης
   4. Ατλας κλινικής Αιματολογίας Carr – BernadetteF. Rodak Εκδόσεις Ζήτα

B. English

   1. Hoffbrand, Color Atlas of Clinical Hematology : 5th ed./2019 HEAL-Link Wiley UBCM ebooks. Eudoxus book code : 91715777

2. Kottke-Marchant, Laboratory, Hematology Practice [electronic resource] HEAL-Link Wiley ebooks. Eudoxus book code: 80502441

4.5. 4rth Semester Courses

Biostatistics

COURSE OUTLINE

1)GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1904051 285-1904052	**SEMESTER**	**4rth**
COURSE TITLE	**Biostatistics**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	1	1
Tutorial (Practical Exercise)	1	1
Total	2	2
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Compulsory Course, Special background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=22 https://moodle.teithe.gr/course/view.php?id=3666

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To recognize the benefits of implementing statistical methodology in Biomedical Sciences
- To classify the different types of data variables
- To select the most appropriate data measurement scales
- To select the appropriate statistical tests
- To identify the aims and objectives of research in biomedical sciences
- To recognize the importance of descriptive and inferential statistics

2. Skills

- Understand the usefulness of biostatistics in the biomedical sciences,
- Analyze research data with Biostatistics applications
- Interpret research data using statistical tools
- Encode and record biomedical data in statistical program files
- Design research protocols using biostatistical programs
- Acquire skills in using computers and appropriate statistical programs

3. Competence

- To be able to present using new technologies tasks-experiments to groups of first year students or groups of secondary school students.
- To develop critical thinking and the ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyze, information, ideas, problems and solutions in order to generate new research ideas.
- Compare and evaluate the research findings using statistical methods for biomedical data
- Evaluate and provide conclusions about the validity of their research using comparative literature and statistical methods.
- Provide evidence to support the conclusions of a study using applications of biostatistics

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

Respect for the natural environment

3) SYLLABUS

THEORY

Statistical survey research design. Basic principles of experimental design.

Encoding and importing data into data files.

Introduction to descriptive statistics. Descriptive Measures, Measures of Central tendency, Measures of dispersion, Measures of Pattern. Probability Theory

Classification and presentation of statistical data: statistical tables and charts, box plot, scatter plot.

Introduction to inferential statistics. Confidence intervals. Sampling procedures, sampling error, sample size, Normal distribution.

Statistical hypothesis testing. Normality tests. Critical values, Errors, Frequency analysis.

Statistical tests for a single sample, Two independent samples, Two dependent samples. Analysis of variance.

Correlation analysis of quantitative variables

Non-parametric statistical tests for data comparison

TUTORIAL

SPSS - Introduction to the statistical program - Importing data

Types of variables - Managing Tables and Graphs

Descriptive Statistics I (mean, median)

Inferential Statistics I (normal distribution, normal curve, standard deviation (SD), variance)

Statistical hypothesis testing. Normality tests. Critical values, Errors, Frequency analysis.

Statistical tests for one sample, for two independent samples, for two dependent samples. Analysis of variance.

Correlations of quantitative variables

Non-parametric statistical tests for comparing data.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class Use of computer to understand and develop the statistical programs for data processing
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity,*	

Activity	***Semester workload***
Lectures	30
Tutorials	30

etc. *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*		
	Course total	60
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions 2. Tutorials Weekly exercises of students with both theoretical and practical exercises (They are graded for the 20% to the final grade of the course). Total course grade: Theory grade 80% + Assignment grade 20%.	

5) ATTACHED BIBLIOGRAPHY

A. Greek

•Triola M. Marc, Triola F. Mario, Roy Jason, 2021. Βιοστατιστική των επιστημών Βιολογίας και Υγείας. Εκδ. BROKEN HILL PUBLISHERS LTD. ISBN: 9789925576289. Κωδ. Εύδοξος 94644937

• Μπερσίμης Σωτήριος, Σαχλάς Αθανάσιος, 2016. Εφαρμοσμένη Στατιστική με έμφαση στις Επιστήμες Υγείας, Εκδ. Τζιόλα & Υιοί Α.Ε. ISBN:978-960-418-660-0 Κωδ. Εύδοξος [69397001]

• ΠΑΠΑΪΩΑΝΝΟΥ ΑΘΑΝΑΣΙΟΣ, ΖΟΥΡΜΠΑΝΟΣ ΝΙΚΟΛΑΟΣ, ΜΙΝΟΣ ΓΕΩΡΓΙΟΣ, 2016. Εφαρμογές της Στατιστικής στις Επιστήμες του Αθλητισμού και της Υγείας με τη χρήση του SPSS.Εκδόσεις ΔίσιγμαISBN: 978-618-5242-05-3 Κωδ. Εύδοξος [77111956]:

B. English

•Christine Dancey, John Reidy, Richard Rowe, 2012. Statistics for the Health Sciences. A non-mathematical introduction. SAGE Publications Ltd, UK. ISBN: 978-184-920-336-4

• Ricardo Ocana - Riola, 2016. The use of statistics in Health Science: Situation analysis and Perspective. Statistics in Biosciences 8(2):204–219. DOI: 10.1007/s12561-015-9138-4

•https://www.spss-tutorials.com

4.6. 4rth Semester Courses

Research Design
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190406	**SEMESTER**	**4rth**

COURSE TITLE	**Research Design**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
	Lectures (Theory)	2	2
	Total	2	2
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Compulsory, General background		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=23 https://moodle.teithe.gr/course/view.php?id=3668		

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- Recognize the design requirements of a biomedical sciences research project
- Describe a research hypothesis in Biomedical Sciences
- Determine the methodologies for undertaking a study in the biomedical sciences
- Selecting literature search tools for Biomedical Sciences

2. Skills

- Understand and combine different data collection methodologies
- Examine and link methodologies for the selection of research aims and objectives
- Investigate and apply literature screening methods
- Assess and apply the classification of research data
- Design the protocol type and genre of study to be used
- Become familiar with the use of databases in Biomedical Sciences
- Become familiar with computer use and new technologies in designing a study in Biomedical Sciences

3. Competence

- To be able to present using new technologies tasks-experiments to groups of first year students or groups of secondary school students.
- To develop critical thinking and the ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyse, information, ideas, problems and solutions in order to generate new research ideas.
- Evaluate and derive conclusions about the research findings using peer reviewed literature
- Assess a study protocol and data collection for the purposes of a research project.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

3) SYLLABUS

Introduction to Scientific Knowledge and Research, Characteristics, Formats, Models and Stages of Scientific Research

Definition of Research Hypothesis and sub-objectives - Methods of data collection and classification - Ethical issues.

Methods of Literature Selection and Data Collection. Searching literature in PubMed and other databases

Categories of studies

Sampling methods. Research protocols. Secondary sources of statistical data collection.

Basic principles of experimental design.

Importing data into files for further analysis

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class Use of computer to understand and develop the statistical programs for data processing
TEACHING METHODS *The manner and methods of teaching are described in detail.*	***Activity*** / ***Semester workload*** Lectures / 60

Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*		
	Course total	60
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions 2. Written Assignment, optional, with oral presentation in class (Graded and gives 10% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors.	

5) ATTACHED BIBLIOGRAPHY

A. Greek

• Γαλάνης Πέτρος, 2022. Μεθοδολογία Έρευνας στις Επιστήμες Υγείας (2η έκδοση), Εκδ. Κριτική ΑΕ. ISBN: 9789605864026. Κωδ. Εύδοξος [112692275]

• Λιαργκόβας Παναγιώτης, Δερμάτης Ζαχαρίας, Κομνηνός Δημήτριος, 2022. Μεθοδολογία της έρευνας και συγγραφή επιστημονικών εργασιών (2η έκδοση), Εκδ Τζιόλα & Υιοί Α.Ε. ISBN: 9789604189120 Κωδ. Εύδοξος [102071601]

• JANET HOUSER, 2019. Η έρευνα στις Επιστήμες Υγείας, Εκδ. Ιωάννης Κωνσταντάρας. ISBN: 9789606080449. Κωδ. Εύδοξος [86201087]

• Λαγουμιντζής, Γ., Βλαχόπουλος, Γ., Κουτσογιάννης, Κ., 2015. Μεθοδολογία της έρευνας στις επιστήμες υγείας. [ηλεκτρ. βιβλ.] Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: http://hdl.handle.net/11419/5356

B. English

• ChristineDancey, JohnReidy, RichardRowe, 2012. Statistics for the Health Sciences. A non-mathematical introduction. SAGE Publications Ltd, UK. ISBN: 978-184-920-336-4

• Ricardo Ocana-Riola, 2016. The use of statistics in Health Science: Situation analysis and Perspective. Statistics in Biosciences 8(2):204–219. DOI: 10.1007/s12561-015-9138-4

4.7 4th Semester Courses

SYSTEMIC PATHOLOGY
COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1904071 285-1904072	**SEMESTER**	**4th**
COURSE TITLE	**Systemic Pathology – Laboratory & Theory**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	3	4
Lab Tutorials	1	
Laboratory	2	2
	6	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	SPECIALTY COURSE, COMPULSORY COURSE
PREREQUISITE COURSES:	YES: 1. GENERAL PATHOLOGY
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=80

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To describe basic pathological entities of organs and systems
- To describe the factors involved in the aetiopathogenesis of diseases

- To describe the basic clinical, epidemiological and histopathological features of important human diseases
- To identify specific pathological techniques and evaluate their results
- To describe the results of specific histochemical techniques
- To recognise errors of techniques and methods
- To describe the immunohistochemical technique
- To describe the immunofluorescence technique
- To describe the specific histochemical and molecular techniques
- To apply protocols for handling and laboratory management of specific materials in the PL (kidney biopsies, bone marrow biopsies, kidney biopsies, bone biopsies, nerve and muscle biopsies etc.).

2. Skills

- Understand the principles of specific histochemistry, immunohistochemistry and in situ hybridization, and to be familiar with the individual steps of the above-mentioned techniques, as well as with the interpretation and evaluation of the results of the specific techniques.
- Apply working dilutions of reagents in the specific techniques
- Able to apply the specific techniques for the diagnosis of diseases
- Apply principles of personal and personnel protection and the environment from biological, physical and chemical hazards in PL
- Apply and modify protocols and steps of special techniques for optimal results of the technique
- Be able to microscopically examine the stained slides with the special techniques (histochemistry, immunohistochemistry)
- Understand the protocols of the specific techniques and be familiar with the individual methodologies

3. Competence

- To be able to present using new technologies tasks-experiments to groups of first year students or groups of secondary school students.
- To develop critical thinking and the ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyze, information, ideas, problems and solutions in order to generate new research ideas.
- To decide on the best provision of First Aid in the laboratory

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

(3) SYLLABUS

THEORY

Congenital disorders - Inflammatory, Autoimmune and Neoplastic diseases: of: Gastrointestinal System (Oral cavity - Oral pharynx - Oesophagus - Stomach - Small and Large Intestine / Appendix, Salivary glands - Liver - Gall bladder - Pancreas), Thorax and Upper and Lower Respiratory System (Nasopharynx - Larynx-Trachea - Bronchi - Lungs - Thymus gland, Pleura), Breast, Skin, Peripheral and Central Nervous System, Lymphohematopoietic System, Soft Tissue and Bone, Organs of the Genitourinary System.

LABORATORY

Introduction to special techniques and molecular pathologicy (histochemistry, electron microscopy, immunohistochemistry (IHC), ISH, PCR, NGS, TMA, Digital Pathology). Special histochemical staining: Preparation of staining solutions - Connective tissue stains (Masson trichrome, Van Gieson, Gomori Trichrome, Reticulin) - Silver staining (Gomori) - Mucopolysaccharide carbohydrate staining (PAS - PAS-D, Alcian Blue pH2.5). Microscopy of tissue sections with special stains under optical microscope. Handling and processing of special materials in PL (kidney, muscle, nerve, bone marrow biopsies). Cryostat microtomy - Rapid Haematoxylin/Eosin staining - Rapid immunohistochemistry. Immunofluorescence. Immunohistochemistry: Procedure of the technique. Staining protocols. Antibodies. Selection of antibodies and detection systems. Chromogens. Evaluation of IHC results - Technical errors. Specific IHC stains such as: SMA, CK AE1/AE3; CD34. Automation in PL (IHC machines). Molecular Pathology, In Situ molecular techniques (FISH, CISH, SISH). Tissue microarrays and Digital Pathology.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure*	**Theory**

Activity	*Semester workload*
Lectures (Theory)	120
Laboratory	80
Course total	200

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions 2. Written Assignment, optional, with oral presentation in class (Graded and gives 20% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors. **Laboratory** 1. Daily assessment of students with theoretical and practical exercises in the laboratory (not graded). 2. Weekly exercises and assignments submitted daily (Not graded). 3. Written/oral final examination with multiple choice questionnaire, short answer questions and case study questions. Note: (2), (3) are carried out if the circumstances such as number of students, workload of teachers etc. allow. Total course grade: Theory grade 60% + Laboratory grade 40%.

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5.1. 5th Semester Courses

Medical Biotechnology
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1905011 285-1905012	**SEMESTER**	**5th**
COURSE TITLE	**Medical Biotechnology**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	3	4
Tutorial	1	
Laboratory	2	3
Total	6	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Course
PREREQUISITE COURSES:	YES 1. Biology – Molecular Biology 2. Human Genetics
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=16, https://moodle.teithe.gr/enrol/index.php?id=3627, https://exams-phym.the.ihu.gr/course/view.php?id=35, https://moodle.teithe.gr/enrol/index.php?id=3628

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*

- *Guidelines for writing Learning Outcomes*

Biotechnology is the science of using organisms or their products and manipulating DNA to produce goods that serve humans directly or indirectly. Medical biotechnology is defined as the use of biotechnology in medical research, treatment and diagnostics.
The teaching objective of this course is to provide students with the knowledge and understanding, as well as the development of skills, of the techniques applied to DNA manipulation and the methodologies of genetic engineering aimed at producing products with therapeutic attributes and for the diagnosis of pathological situations. The areas addressed in the course are methodologies for DNA analysis and manipulation, for the production of pharmaceutical proteins, monoclonal antibodies, etc., as well as newer challenges in Medical Biotechnology such as gene therapy and nanotechnology.
Upon completion of the course, students are expected to have acquired:

1. Knowledge

- Understand the role of microorganisms in the large-scale production of biotechnological products and the processes by which this is achieved
- Be familiar with cloning vectors and evaluate their use according to the objective of their application
- To provide students with the theoretical and technical knowledge necessary to understand, combine and apply recombinant DNA technology for the production of pharmaceutical proteins, monoclonal antibodies (diagnostics and therapy)
- To know, understand, combine and apply techniques to generate gene and cDNA libraries
- To know and understand the methodologies and strategies of gene therapy for various human diseases (haemoglobin diseases, cystic fibrosis, cancer, etc.)
- Acquire the necessary familiarity with the concepts, principles and methodology of nanotechnology and nanomedicine, as well as with the applications of nanoparticles and nanodevices in the diagnosis, imaging and treatment of human diseases.

2. Skills

- Apply methods for DNA isolation from bacteria, eukaryotic cells (whole blood, epithelial cells, hair follicle) and plasmid DNA and be able to identify isolation source characteristics
- Apply methods for the quantitative and qualitative determination of nucleic acid solutions
- Be familiar with the construction of restriction maps
- Perform DNA substrate digestion experiments with various restriction enzymes and evaluate their results against expected standards
- Apply molecular diagnostic techniques (detection of gene loci-markers by PCR) in forensic science and criminology
- Apply bacterial transformation experiments with recombinant DNA and be able to identify its expression in bacterial cells and the yield of transformation by counting individual colonies.

3. Competence

- Be able to present, using new technologies, experimental work to groups of first-year students or groups of secondary school students.
- Develop critical thinking and the ability to identify and resolve problems (troubleshooting) related to the performance and quality of the nucleic acid extracted during DNA isolation experiments
- Develop critical thinking and problem identification (troubleshooting) skills when performing DNA substrate digestion experiments with different restriction enzymes working alone or in groups.
- Develop critical thinking and problem identification (troubleshooting) skills while

performing experiments to identify genetic marker loci.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

3) SYLLABUS

THEORY

- Basic principles and methodologies governing Genetic Engineering and Molecular Biology in the services of medical research, treatment and diagnostics are the main topics of the course. The syllabus of the course includes in detail:
- General Principles of Biotechnology: Chemical structure of nucleic acids, Packaging of nucleic acids, Properties of nucleic acids, Bacteria as the "workers" of Biotechnology, Escherichia coli is the model bacterium, The role of plasmids in bacteria, Yeasts and filamentous fungi in Biotechnology
- Nucleic acid analysis methods: isolation and purification of DNA, Electrophoresis separates DNA fragments by size, Hydrolysis (digestion) with restriction endonucleases, Methods of isolating DNA fragments of known sequence and sequence authentication
- Recombinant DNA technology: introduction of a gene into bacterial cells to produce a specific product, DNA vectors, introduction of DNA into a vector, overexpression technique in bacterial cells, purification of the overexpression product, introduction of DNA into mammalian cells
- Genome Library Preparation (Genetic Material): Construction of a Genomic Library, Construction of a cDNA Library, Selection of a DNA library colony with the desired fragment
- Genetically modified animals: Methods of creating transgenic animals
- Gene therapy - strategies, applications
- Biotechnology in the production of monoclonal antibodies
- Molecular diagnostics: Definition of Molecular Diagnostics, Applications of Molecular Diagnostics, Techniques of Molecular Diagnostics, Examples of Molecular Diagnostics applications

- Nanotechnology and Nanomedicine: nanoparticles in the service of human health

LABORATORY

- Introduction to the basic principles of biotechnology and laboratory practice (equipment, safety, proper use of equipment)
- Chromosomal DNA isolation from eukaryotic and prokaryotic cells using commercially available reagents (kits) and in-house methods
- Plasmid DNA isolation by in-house alkaline lysis method
- DNA quantification. Fundamentals of spectrophotometry.
- Introduction to recombinant DNA methodology and gene cloning - Hydrolysis (digestion) of bacterial and plasmid DNA substrates with restriction enzymes.
- Construction of restriction map.
- Analysis of nucleic acids by electrophoresis. Method principles. Types of electrophoresis
- Polymerase Chain Reaction (PCR) - Applications of PCR in Molecular Diagnostics, Forensic Science and Criminology - Detection and analysis of PCR products for STR gene loci. Interpretation of reaction results.
- Bacteria - Methods of culture and measurement of bacterial cells
- Transformation of bacterial cells with the pGlO system - evaluation of results.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face. The laboratory is held at the Molecular Biology-Genetics & Medical Biotechnology Laboratory
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Basic software (windows, word, power point, the web, etc.). • Support of learning process through the electronic platform / e-class • Problem solving methodology is uploaded and accessible by students as pdf files in e-class. • Instructions for writing assignments (Theory and Laboratory) are uploaded and accessible by students as pdf files in e-class.
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION	Theory

Activity	*Semester workload*
Lectures	106
Laboratory paper preparation	20
Laboratory	84
Course total	210

Description of the evaluation procedure *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions - Matching questions - True-false questions with justification - Development-response questions - Problem solving Laboratory 1. Daily assessment of students with theory and hands-on exercises in the laboratory (not graded). 2. Written final examination may include: - Multiple Choice Test. - Short answer questions - Matching questions - True-false questions with justification - Problem solving 3. Compulsory written assignment - construction of a family tree (Graded and contributes 20% to the final grade of the final theory examination). **Total course grade: Theory grade 60% + Laboratory Grade 40%** For Erasmus students who may have selected the course, an assignment is given in the course subject area, which will be presented and examined in English.

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5.2 5th Semester Courses

MEDICAL MICROBIOLOGY II (CULTURES OF BIOLOGICAL FLUIDS - FOOD - WATER)
COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1905021 285-1905022	SEMESTER	5th
COURSE TITLE	MEDICAL MICROBIOLOGY II		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g., lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Theory	3	4
Tutorial	1	
Laboratory practice	2	3
	6	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Course
PREREQUISITE COURSES:	General Microbiology
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3630, https://moodle.teithe.gr/enrol/index.php?id=3629, http://www.mls.teithe.gr

(2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.
Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To know how to collect biological fluids and secretions
- To know how to transport biological fluids and secretions to the laboratory
- To know how to culture biological fluids and secretions
- To know the modern and classic methods of identification, the application of the antibiogram (Kirby Bauer, E – test, MIC), the phenotypic and molecular investigation of antibiotic resistance genes

2. Skills

- Safely manage biological fluids and secretions (collection-transport-inoculation in the appropriate nutrient media)
- Identify and evaluate bacterial colonies isolated from cultures
- To identify the isolated strains based on their biochemical properties
- To apply the antibiogram with conventional and newer methods
- To investigate phenotypically and genetically the resistance of bacterial strains against the antibiotics used
- To recognize the relevant terminology and internationally used abbreviations in diagnostic orders for the diagnosis of bacterial diseases
- To apply principles of personnel and environmental protection from bacteria.

3. Competence

- The application of the antibiogram and the selection of appropriate antibiotics based on the system of the human body and on the type of pathogen
- The acquisition of skills in the isolation, detection and identification of bacteria by applying conventional and molecular methods.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations Decision-making	Showing social, professional and ethical responsibility and sensitivity to gender issues
Working independently Team work	Criticism and self-criticism Production of free, creative and inductive thinking
Working in an international environment Working in an interdisciplinary environment	…… Others…
Production of new research ideas	…….

- Search, analysis and synthesis of data and information, using the necessary technologies
- Working independently
- Teamwork
- Work in an interdisciplinary environment
- Work in an international environment
- Production of new research ideas

(3) SYLLABUS

THEORY

Principles of collecting biological fluids and secretions - their transport to the laboratory - microscopical examination of specimens: direct and examination of stained preparations. - Cultures - Identification methods - Antibiogram and its study phenotypically and with molecular methods (mechanisms of bacteria resistance against antibiotics). Study of the following biological fluids and specimens:

- Pus, Abscess – Tissue or aspirates
- Pharyngeal secretion
- Sputum
- Vaginal swabs
- Urethral swabs
- CSF
- Joint fluid
- Faeces
- Skin lesions-trauma
- Urine culture
- Blood culture
- Bacteriological Testing of water supplies

LABORATORY

Collection of biological fluids and secretions - transporting them to the laboratory - Preparation of direct and stained preparations - Cultures - Identification methods - Antibiogram and its study phenotypically and with molecular methods (mechanisms of resistance of bacteria against antibiotics)

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the Microbiology II-Immunology lab room, face to face.

<table>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Lectures and tutorials using audio-visual media, both in the theoretical and laboratory part.
• Use of the e-mail and the Department's website to communicate and inform students, respectively.
• Use of the e-class (moodle.teithe.gr) for the posting and circulation of scientific articles, instructions, lectures, useful links, anatomical images, questionnaires, information for attending conferences and seminars related to the course, etc.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.
The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td><table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>120</td></tr><tr><td>Laboratory practice</td><td>90</td></tr><tr><td>Tutorial</td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>210</td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Theory
1. Written Assignment optional with public presentation (Graded and gives 20% to the final grade of the final theory exam).
2. Written final exam including:
✓ Assay Questions type
✓ Multiple Choice questions
✓ Short Answer questions
Note: (1) is carried out as long as the circumstances allow it, such as the number of students, the workload of teachers, etc.

Laboratory
1. Assessment of students with theoretical and practical exercises in the laboratory (Not graded).
2. Weekly exercises and assignments submitted daily (Not graded).
3. Mid-term exam to the laboratory exercises section (in case of a successful exam, possibility of exemption from part of the material in the final exams)
4. Written/ oral final exam with multiple choice questions, short answer questions and case study questions
Note: (2) and (3) are carried out as long as the conditions allow, such as the number of students, the workload of teachers, etc.
The midterm exam (4) may not take place, depending on the special circumstances of the semester.
Total course grade: Theory grade 60% + Lab grade 40%</td></tr>
</table>

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5.3. 5nd Semester Courses

COURSE OUTLINE

CLINICAL CHEMISTRY II (DIAGNOSTIC ENZYMOLOGY – CLINICAL BIOCHEMISTRY OF ELECTROLYTES)

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1905031 285-1905032	**SEMESTER**	**5th**
COURSE TITLE	**CLINICAL CHEMISTRY II (DIAGNOSTIC ENZYMOLOGY – CLINICAL BIOCHEMISTRY OF ELECTROLYTES)**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	2	4
Laboratory Exercise	2	2
Total	4	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Course
PREREQUISITE COURSES:	YES: 1. Biochemistry I 2. Biochemistry II
LANGUAGE OF INSTRUCTION and	GREEK

EXAMINATIONS:	
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=2141, https://moodle.teithe.gr/course/view.php?id=2142&notifyeditingon=1, www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The purpose of the course is to help students understand the diagnostic value of enzymes as well as electrolytes and to familiarize themselves with their determination methods for diagnostic purposes.
Because routine determinations of enzymes and electrolytes are performed in serum, the course includes an introduction to the types of blood sample depending on processing, the types of anticoagulants and their effect on Biochemical/Clinical Chemistry determinations.

Upon completion of the course, students are expected to have acquired:
Part A: Enzyme Determinations
Knowledge
The purpose of the course is to help students understand the diagnostic value of serum enzymes and familiarize them with the methods of enzyme determination using various laboratory instruments. In particular, the contribution of enzyme determination to the control of pancreatic function, liver and bone function and their use in the diagnosis of related pathological conditions, their contribution to the diagnosis of myocardial infarction and various types of myasthenia, to the diagnosis of cancer and monitoring the course of the disease, etc
In addition, enzymes involved in the control of oxidative conditions (G6PD), enzymes involved in muscle relaxation during surgery (cholinesterase), monitoring of the effect of poisons and toxic agents, monitoring of alcohol use, forensics, etc. are examined.
Although the laboratory techniques described are for determination of enzymes in serum or plasma, reference is made to determination of enzymes in other tissues and biological fluids.
Students learn enzyme abbreviations and all related terminology in Greek and English.
In more detail, students learn the origin of serum enzymes with an emphasis on enzymes of diagnostic interest (amylase, lipase, acid and alkaline phosphatase, transaminases, lactate dehydrogenase, creatine phosphokinase, aldolase, γ-glutamyl transpeptidase, G6PD, etc.).
The various forms of isoenzymes and the tissues from which they originate. The physiological role of enzymes and isozymes in tissue cells and the causes of their increased serum concentration in pathological conditions.
They learn the reactions catalyzed by the studied enzymes, the conditions that influence their action and the differences of the isozymes in terms of their catalytic and physicochemical properties (optimal pH of action, selective use of substrates, specific inhibitors and activators, differences in molecular weight, glycosylation, isoelectric point, etc.), with the aim of understanding the way in which these are utilized in the selective determination of isozymes.
Students learn the available techniques for enzyme and isozyme determination, the principle on which they are based, the conditions for their correct application and the factors that can affect the reliability of the determinations (endogenous factors: biomolecules that exist in the biological fluid naturally or due to co-existing diseases, due to food intake or exogenous factors, such as drug administration, due to sample processing, contamination, storage conditions, conditions for carrying out the determination, etc.).

They learn the normal values and their variation according to the temperature of determination process, sex, age, racial and other factors. They learn to choose the appropriate normal values according to the determination conditions and the group to which the patient belongs (adult, child) or to adapt the method to the available normal values (choice of appropriate conversion/harmonization factors). They learn to recognize pathological specimens.

Part B: Acid-base balance. Electrolyte determinations.

The aim of part B is the students to understand the acid-base balance of the body, the factors that affect it, the correlation of its disturbances with pathological conditions and the laboratory determination techniques that can reveal possible disturbances.
Additionally, the goal of this part is to understand the role of electrolytes in body fanction, the factors that affect their concentration in the body, the techniques for determining electrolytes (K, Na, Ca, Mg, etc.) and their diagnostic value.

More specifically, the students:
-They know and understand the basic composition of intracellular and extracellular fluids
- They understand concept of osmolality, the basic ions related to the change in osmotic pressure, the effects of their changes and the pathological conditions associated with them.
-They understand the concept of acid-base equilibrium, the buffer systems of the body, the factors that can affect blood pH, the related mechanisms of pH regulation and the pathological conditions related to their disturbance.
-They learn and understand the mechanisms for regulating the absorption, transport, storage, response and mobilization of ions and radicals (sodium, potassium, chloride, calcium, magnesium, phosphate and iron, etc.)
-They learn the various techniques for the determination of the above ions and the factors that may affect the reliability of the determination.
-Apply ion determinations in practice.

Skills
In laboratory exercises, students acquire skills
• in the application of the techniques for determining the studied enzymes and electrolytes.
• in the use of various instruments such as semi-automatic and automatic analyzers and dry chemistry analyzers.
• In setting the parameters of the semi-automatic analyzers according to the available determination method
• In the recognition of indications of unreliable identification

Competence
In the theoretical part:
• Students acquire the ability to understand the correlation of enzyme and electrolyte values with pathological conditions
• The possibilities of using these values for diagnostic purposes
• The non-pathological factors that may affect the concentrations of specific indicators.

In the laboratory part:
• They acquire the ability to check the reliability of the methods, to recognize possible errors and their causes and to decide the procedures to be followed in order to get a reliable result.
• Check accuracy and repeatability and identify possible systematic errors.
• They also acquire the ability to recognize the differences between available techniques and choose the most appropriate one, based on reliability, sensitivity, accuracy and repeatability, cost of consumables, cost and availability of instruments, speed and suitability for large or small number of samples etc.
• They learn to set up, control and adapt semi-automatic and automatic clinical chemistry laboratory analyzers to available diagnostic methods.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working independently
Team work
Adapting to new situations
Decision-making
Working in an interdisciplinary environment
Production of new research ideas
Working in an international environment
Working in an interdisciplinary environment
Criticism and self-criticism

3) SYLLABUS

THEORY

Determination and clinical significance of serum enzyme concentration changes.
Enzymes as indicators of pathological conditions.
The contribution of enzyme determination to the evaluation of pancreatic function, liver and bone function. Myasthenia, myocardial infarction and the contribution of enzyme determination to its diagnosis. Enzyme changes in cases of cancer and the contribution of enzyme determination to the diagnosis of cancer and to the monitoring of the disease, etc.

Electrolytes, concentration regulation and clinical significance of serum electrolyte changes, determination of electrolytes. Osmolarity. Acid-base balance. Iron metabolism, determination and clinical significance of iron, transferrin, TIBC and ferritin concentrations.

LABORATORY EXERCISE & TUTORIALS

Introduction to blood tests (specimen types, anticoagulants: applications and limitations, preservation methods).
Quality Control OF Clinical Chemistry Laboratory (Checking accuracy and repeatability of determinations, standard deviation, error rate, acceptable error rate).
Instrument Programming, Operation and Checking:

-Operation of **semi-automatic analyzers**, control and modification of parameters.
-Automatic Biochemical Analyzer: Operation, Functionality Check and Programming.
-Principle of **Dry chemistry analyzers.** Operation of Reflotron
-Principle of **ion-selective electrodes analyzers**

Enzymatic reactions and factors affecting them. Enzyme determination methods, definition and calculation of enzyme units. Causes of errors.

General principles of isozyme determination methods.

Laboratory application in the determination of amylase, alkaline phosphatase and prostatic acid phosphatase, γ-glutamyl-transferase, lactate dehydrogenase (LDH) and transaminases GOT, GPT, creatine phosphokinase CPK, CPK-MB, G6PD using photometer, semi-automatic analyzer, automatic biochemical analyzer and dry chemistry analyzer Reflotron. Learning to set up instruments and apply enzyme kinetic assays.

Determination of electrolytes. Determination of K using Reflotron.

Determination of Na using ion-selective electrodes.

Determinations of divalent metal ions - Laboratory application to the determination of calcium and magnesium by coloured complex photometric methods. Application in semi-automated analyzers.

Determination of iron and total iron binding capacity (TIBC).

Determination of ferritin by ELISA method.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures face to face Laboratory Exercise at the Lab of Clinical Chemistry Where appropriate online training via zoom.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Lectures using audio-visual media. Use of e-class to post power-point presentations, scientific articles, instructions, useful links, videos, quizzes etc.
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	

Activity	*Semester workload*
Lectures using audio-visual media. Assignments/Project Presentations by students.	120
Laboratory Exercise in groups of 20-25 people Practical laboratory exercise and Projects including brief description of the laboratory process and results	60
Total	180

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation,*	Theory Written final exam including: Multiple Choice Test Short Answer Questions Project (optional) Intermediate examination of part of the material.

other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Laboratory part • Results of laboratory exercises and their brief presentation • Written/oral final exam with multiple choice, short development questions • project (optional)

5) ATTACHED BIBLIOGRAPHY

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- «Κλινική Χημεία ΙΙΙ, ΕΞΕΤΑΣΕΙΣ ΑΙΜΑΤΟΣ, Εργαστήριο», Ιωαννίδη Ιωάννη, Εκδόσεις Γιαχούδη, ISBN 960-7425-59-6 set 960-7425-62-6, 2002, Θεσσαλονίκη(ΕΥΔΟΞΟΣ: Βιβλίο [13893]
- Karen J.TietzePharmD. Chapter 5 – "Review of Laboratory and Diagnostic Tests" in "Clinical Skills for Pharmacists", 3rd Edition, 2012.
- "Diagnostic Enzymology" Walter se Gruyter GmbH, 2014, Berlin/Boston, ISBN 978-3-11-020724-8.
- «Κλινική Βιοχημεία» Allan Gaw, Michael J. Murphy, Robert A. Cowan, Denis St. J. O' Reilly, Michael J. Stewart, James Shepherd, επιμέλεια: Αθανάσιος Γ. Παπαβασιλείου. Παρισιάνου Α.Ε., 2010, ISBN 978-960-394-707-3
- «Clinical Biochemistry and Metabolic Medicine», Martin Andrew Crook Eighth Edition, 2012, CRC Press ISBN 9781444144147

5.4 5th Semester Courses

Anemias - Blood Transfusion (Hematology II)

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1905041 285-1905042	SEMESTER	5th
COURSE TITLE	**Anemias - Blood Transfusion (Hematology II)**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Tutorials (Theory)	3	4
Laboratory practice	2	2
	5	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Course
PREREQUISITE COURSES:	YES Hemopoiesis-Blood Physiology (Hematology I)
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=67 https://exams-phym.the.ihu.gr/course/view.php?id=51 https://moodle.teithe.gr/course/view.php?id=3634 https://moodle.teithe.gr/course/view.php?id=3635

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

7. Knowledge
   To recognize and understand the causes, the pathophysiology, the symptoms and the laboratory findings of anemias.
   To learn the organization, the services and the responsibilities of blood transfusion departments
   To understand laboratory methods and techniques used in blood transfusion departments
   To understand laboratory tests used to diagnose anemias.
   To determine the pre-transfusion testing.

8. Skills
   To identify abnormal red blood cells morphology under microscope
   To apply common techniques used in the hematology laboratory for the diagnosis of anemias
   To apply common techniques used in transfusion medicine.
   To interpret complete blood count results in order to diagnose and classify anemias.

3. Competence

- To develop critical thinking and the ability to interpret pre-transfusion testing and laboratory tests for the diagnosis of anemias, working alone or in groups.
- To be able to collect, synthesize, analyze, information, ideas, problems and solutions in order to generate new research ideas in the field of hematology and transfusion medicine.
- To be able to avoid laboratory errors in order to achieve accurate results.
- To apply the procedures for blood transfusion safety

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary	Project planning and management Respect for difference and multiculturalism

technology	Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility
Decision-making	and sensitivity to gender issues
Working independently	Criticism and self-criticism
Team work	Production of free, creative and inductive thinking
Working in an international environment	……
Working in an interdisciplinary environment	Others…
Production of new research ideas	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

Theory: Anemias+ (definition, pathogenesis,etiological classification, morphological classification,symptoms) Iron absorption, transfer, storage.Iron deficiency anemia.Megaloblastic anemia Anemia of chronic disease. Hemolytic anemias G-6PD Deficiency Hemoglobinopathies Blood donation requirements ABO Blood group system Rhesus blood group system. Transfusion related reactions and complications Blood componenents preparation , storage,indications of use

Laboratory :Diagnosis of anemia based on the comlete blood count Red blood cell morphology on blood smears Reticulocytes Laboratory diagnosis of hemoglobinopathies -Hemoglobin elecrophpresis and HPLC .ABO and Rhesus Blood typing Direct and indirect Coombs test Pretransfusion compatibility testing

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>120</td></tr><tr><td>Laboratory practice</td><td>60</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>180</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions Laboratory

questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	1. Theoretical an practical exercises (non graded) 2. Written final exam may include: - Multiple Choice questionnaire - Short answer questions - Laboratory results inerpretation

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Σημειώσεις «Αναιμίες» Ελένη Βαγδατλή – Τσικοπούλου, Βασιλική Κωνσταντινίδου
2. «Αιμοδοσία» Αλεξάνδρα Τζιμογιάννη-Ιωαννίδου, Γεώργιος ΜπόλλαςΕκδόσεις Νέων Τεχνολογιών.
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3. Manfred Wick, Wulf Pinggera, Paul Lehmann, Clinical Aspects and Laboratory Iron Metabolism, Anemias [electronic resource] HEAL-Link Springer ebooks Sixth, revised and updated edition/2011. Eudoxus book code : 73232169
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5.5. 5th Semester Courses

MEDICAL CYTOLOGY
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285 – 190505	**SEMESTER**	**5th**
COURSE TITLE	**MEDICAL CYTOLOGY**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	3	4
	3	4

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Course	
PREREQUISITE COURSES:	2 BASIC HISTOLOGY & METHODS OF STUDY - GENERAL EMBRYOLOGY (THEORY & LABORATORY PRACTICE) 2 GENERAL PATHOLOGY (THEORY & LABORATORY PRACTICE)	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK	
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-	
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3637 /view.php?id=3637, https://moodle.teithe.gr/course/view.php?id=3616http://www.mls.teithe.gr	

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. **Knowledge**

To know the basic principles of General cytology:Cell – Cell Cycle - Cellular Differentiation Morphological criteria of cellular dedifferentiation
To plan population control programs knowing the basic principles and limitations of their application, especially the cervical cancer prevention
To Know cellular changes in specimens of pathological tissues and body fluids
To know techniques for obtaining cytological samples from palpable and non-palpable organs, with the contribution, when required, of imaging methods (Ultrasound –Computed Tomography-Magnetic Tomography radiation therapy, hormone therapy, thermocoagulation, cryocoagulation chemotherapy To have knowledge of Molecular Cytopathology(Basic data of Cytogenesis - HPV infection –Carcinogenesis

2. **Skills**

To understand the enormous contribution of cytology in the prevention, diagnosis and follow-up of patients after the application of therapeutic regimens as : chemotherapy, radiation therapy, hormone therapy, thermocoagulation, cryocoagulation
To Perform techniques for obtaining and processing cell samples from organs and body fluids

3. **Competence**

To gain experience in the subjects of Diagnostic cytology and the use of new technologies το develop cooperation in groups with the aim of producing research work and specialized research methods for the benefit of Medical science.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
	Showing social, professional and ethical responsibility and

Working independently	*sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

3) SYLLABUS

Theory

General Cytology Purpose - Basic Principles -Cell (Structure / Receptors / Connections) Cell cycle –Cell differentiation - Cellular dedifferentiation – Morphological criteria of malignancy – Dyskaryosis /Dyskeratosis- Molecular Cytopathology (Basics of Cytogenetics – Carcinogenesis Genes /HPV infection and carcinogenesis)-Population Control Programs (Basic Principles – Planning – Limitations) –Application to the Prevention of Cervical Cancer - Diagnostic Cytology Female Reproductive System - Bethesda System- Breast -Respiratory/Digestive Tract – Biliary Urinary System / Retroperitoneal space /Glands (Salivary – Adrenal – Thyroid – Liver – Pancreatic) - Eye - Skin - Lymph Nodes - Head / Neck Organs – Fluid (CSF/Articular/Pleuritic/ Pericardial/Ascites) -Cytological evaluation -Prognostic indicators (hormone receptors - after application of therapeutic regimens (radiation/chemo/immune/hormone therapy - thermo/cryocoagulation –Laser –Loop –
Observation Systems - Flow Cytometry – Morphometry -Diagnostic evaluation of Cytological methods -Diagnostic Quality Assurance in Cytology – Teaching and Learning methods - evalluation -Tests: Cytochemical / Immunocytochemical- Molecular techniques with application in Cytopathology

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	

Activity	***Semester workload***
Lectures	120
Study and Analysis of Bibliography	
Course total	120

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple*	Theory 1. Written final exam may include: - Multiple Choice questionnaire

choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	- Short answer questions 2. Written Assignment, optional, with oral presentation in class (Graded and gives 10% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors.

5) ATTACHED BIBLIOGRAPHY

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6.1 6th Semester Courses

Medical Virology

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE
ACADEMIC UNIT	BIOMEDICAL SCIENCE

LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1906011 285-1906012	SEMESTER	6th
COURSE TITLE	**Medical Virology**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Lectures (Theory)	3	3
Laboratory practice	3	3
	3	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Compulsory course Specialty course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3672, https://moodle.teithe.gr/enrol/index.php?id=3672, http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:
Knowledge
• Recognize the basic and critical biological characteristics and molecular and biochemical properties of pathogenic viruses that contribute to the pathophysiology of infection and the manifestation of the disease they cause.
• To describe virus-human interactions and their effects on disease induction and manifestation.
• To recognize the most important pathogenic viruses that cause infections, how they are transmitted, how they multiply and how they are treated.
• To recognize the relevant terminology and internationally used abbreviations in the diagnostic orders for the diagnosis of viral diseases.
• Describe the prevention of viral infections through immunization.
• Describe the clinical and epidemiological characteristics of viruses and the diseases they cause in humans.
• To describe the laboratory diagnosis of viruses by applying various methods (culture, serological, molecular methods, etc. regarding the isolation, detection and identification of viruses).
Skills
• To have understood the principles of laboratory diagnosis of viral infections and to have become familiar with isolation, culture, identification/typing detection methodologies as well as with the interpretation and evaluation of laboratory findings.
• Apply the diagnostic methods used in the diagnosis of viruses with an emphasis on new technologies.
• To be able to inform about the correct procedure for receiving, maintaining and transporting biological samples.

• To apply principles of personal and environmental protection against viruses.
Competence
• To be able to present using new technologies work-experiments to groups of first-year students or to groups of secondary school students.
• To develop critical thinking and ability to identify and solve problems, working alone or in groups.
• To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

Theory
Classification, structure, biochemical properties of viruses [Families, genera, strains, main characteristics of all families]. Principles of the structure and reproduction of viruses. The replication cycle of viruses in cells (attachment, adsorption, replication, release of new viral particles from host cells. Principles of viral genetics. Genetics of oncogenic viruses. Host immune response to viruses.
Role of viruses in causing disease. Antiviral drugs. Diseases caused by viruses, epidemiology and pathogenesis of various viral infections (Orthomyxoviruses-Paramyxoviruses, Raboviruses-Coronaviruses, Filoviruses-Parvoviruses, Adenoviruses-Herpesviruses, Papillomaviruses, Polyomaviruses, variolaviruses, Retroviruses-Hepatoviruses (Structure, function, pathogenicity, laboratory diagnosis). Viral gastroenteritis Viral hepatitis Epidemiology of influenza Viruses causing congenital infections Viruses affecting the Cerebrospinal Fluid.
LABORATORY
Introduction to Diagnostic Virology. Virology Laboratory Equipment, Principles of Laboratory Safety, Methods used for the laboratory diagnosis of viruses (Culture, Electron microscope, Aglutination reaction, Coombs test, Complement fixation test, Indirect hemagglutination, Western Blot Assay), Indirect Immunofluorescence, ELISA, PCR). Diagnosis of Infectious Mononucleosis, detection of heterophilic antibodies, IgM Ab against the Epstein-Barr Virus (Mono test). Detection of specific IgM – IgG antibodies against the EBV virus. Detection of viral antigens in a stool sample, CSF, etc.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of	

Activity	Semester workload
Lectures	120
Laboratory practice	60

bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Course total: 180
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions Laboratory 1. Theoretical an practical exercises (non graded) 2. Written final exam may include: - Multiple Choice questionnaire - Short answer questions - Laboratory results inerpretation

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Εισαγωγή στη σύγχρονη Ιολογία, Τύπος: Σύγγραμμα, Κωδικός Βιβλίου στον Εύδοξο: 94644560, ISBN: 9789601224817, Συγγραφείς: Dimmock J. Nigel, Easton J. Andrew, Leppard N. Keith, Επιμ. Μήτκα Στέλλα, Μπελούκας Απόστολος, Διαθέτης (Εκδότης): UNIVERSITY STUDIO PRESS - ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΙΑ ΓΡΑΦΙΚΩΝ ΤΕΧΝΩΝ ΚΑΙ ΕΚΔΟΣΕΩΝ, Έκδοση: 1η ελληνική έκδ./2020
2. Ιολογία-Εξερευνώντας τους Ιούς, Τύπος: Σύγγραμμα, Κωδικός Βιβλίου στον Εύδοξο: 86053314, ISBN: 9789925575176, Συγγραφείς: Shors Teri, Διαθέτης (Εκδότης): BROKEN HILL PUBLISHERS LTD, Έκδοση: 1/2020
3. ΙΟΛΟΓΙΑ: ΕΓΧΡΩΜΟ ΕΙΚΟΝΟΓΡΑΦΗΜΕΝΟ ΕΓΧΕΙΡΙΔΙΟ, Τύπος: Σύγγραμμα, Κωδικός Βιβλίου στον Εύδοξο: 68401258, ISBN: 9789605832001, Συγγραφείς: STEPHEN N.J. KORSMAN, GERT U. VAN ZYL, LOUISE NUTT, MONIQUE I. ANDERSSON, WOLFGANG PREISER, Διαθέτης (Εκδότης): ΠΑΡΙΣΙΑΝΟΥ ΜΟΝΟΠΡΟΣΩΠΗ ΑΝΩΝΥΜΗ ΕΚΔΟΤΙΚΗ ΕΙΣΑΓΩΓΙΚΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΕΙΑ ΕΠΙΣΤΗΜΟΝΙΚΩΝ ΒΙΒΛΙΩΝ, Έκδοση: 1η/2017
4. Καλκάνη Μπασιάκου Ελένη. Ιολογία. Εκδόσεις ΈΛΛΗΝ. Αθήνα 2008.
5. Haaheim L. R, Pattison J.R, Whitley R.J. Πρακτικός οδηγός Ιατρικής Ιολογίας (Ελληνική έκδοση). Επιστημονικές Εκδόσεις ΠΑΡΙΣΙΑΝΟΥ Α.Ε. Αθήνα 2004

B. English

1. Murray P, Rosenthal K, Pfealler M. Medical Microbiology. 7 edition Elsevier 2012.
2. Mark Gladwin, William Trattler, C. Scott Mahan. Clinical Microbiology Made Ridiculously Simple. 6 edition. Medmaster 2014.
3. Warren Levinson. Review of Medical Microbiology and Immunology. 13 edition. Lange Medical Books. 2014
4. Dimmock NJ, Easton A.J, Lappard K.N. Introduction to modern virology. 6 edition, Blackwell 2007

6.2. 6nd Semester Courses

Immunology I

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE
ACADEMIC UNIT	BIOMEDICAL SCIENCE
LEVEL OF STUDIES	UNDERGRADUATE

COURSE CODE	285-1906021 285-1906022	SEMESTER	6th
COURSE TITLE	**Immunology I**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Lectures (Theory)	3	3
Laboratory practice	2	2
	5	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3673 https://moodle.teithe.gr/course/view.php?id=3674 http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

• To learn and describe in detail the structure of the immune system, cells and organs that participate in immune response as well as cell cooperation.
• To learn the basic mechanisms of cellular and humoral immunity, the acquired immunity and the mechanism of infection
•To understand internationally used terminology

2. Skills

•To understand the antigens, antibodies, complement, and cellular co-operation
•To understand the cells, molecules and organs which participate in immune response
•To understand the principles and methodology of laboratory diagnosis of infections and the interpretation and evaluation of laboratory findings.

3. Competence

•To evaluate good practice of immunology techniques
• To be able to present using new technologies work-experiments to groups of first-year students.

• To develop critical thinking and ability to identify and solve problems, working alone or in groups. • To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility and sensitivity to gender issues
Decision-making	Criticism and self-criticism
Working independently	Production of free, creative and inductive thinking
Team work	……
Working in an international environment	Others…
Working in an interdisciplinary environment	…….
Production of new research ideas	

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

Theory

- Structure and function of immune system – Lymphoid system.
- Cells of the immune system.
- Adhesion molecules.
- Cell apoptosis.
- Antigens, mitogens, adjuvants, superantigens.
- Immunoglobulines - Antibodies.
- Cytokines: immune response mediators.
- The Complement system
- Inflammation – Sepsis.
- Acute phase proteins – thermal shock proteins.
- Innate immunity.
- Specific acquired immunity.
- Immunity tolerance

LABORATORY

Laboratory methods and techniques in Immunology (Agglutination reaction, Coombs test, Complement fixation test, Indirect hemagglutination, Western Blot Assay, nephelometry, turbidimetry, Direct and Indirect Immunofluorescence, ELISA, PCR, CLEA). Diagnostic serum techniques (Widal,Wright, C.R.P. latex, Ratest, Monotest, ASTO, β-HCG).

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.

<table>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Basic software (windows, word, power point, the web, etc.).
Support of learning process through the electronic platform / e-class</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td><table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>90</td></tr><tr><td>Laboratory practice</td><td>60</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>150</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Theory

1.Personal project
Written final exam may include:
- Multiple Choice questionnaire
- Short answer questions

Laboratory
1. Theoretical an practical exercises (non graded)
2. Written final exam may include:
- Multiple Choice questionnaire
- Short answer questions
- Laboratory results inerpretation</td></tr>
</table>

5) ATTACHED BIBLIOGRAPHY

-Recommended References:

A. Greek references

- Παυλάτου Μ., Ανοσολογία, Λίτσας, 2004.
- Γερμένης Α., Ιατρική Ανοσολογία, Παπαζήσης, 2000.
- Μπούρα Π., Γαρύφαλλος Α. Δανιηλίδης Μ. Κλινική Ανοσολογία, University Studio Press, 2011
- Thomas Kindt et al. Kuby Ανοσολογία Πασχαλίδης, 2013
- Abbas A., Lichtmann A.,Βασική Ανοσολογία, Πασχαλίδης, 2013
- Barrett J. Βασικές Αρχές Μικροβιολογίας και Ανοσολογίας, Παρισιάνος, 2002
- J.D.M.Edgar, Ανοσολογία. Παρισιάνος, 2013
- Lippincott's, R.A.Harvey, Ανοσολογία. Παρισιάνος, 2014
- J.H.L. Playfair, B.M.Chain, Ανοσολογία με μια ματιά. Παρισιάνος, 2004
- H. Chapel, et al. Κλινική Ανοσολογία. Παρισιάνος, 2014
- Γερμένης Αναστάσιος Ε., Διαγνωστική Ανοσολογία, Λάρισα 2002.

B. English references

- Roitt I., Essential Immunology Wiley-Blackwell 13th edition, 2017

- Warren Levinson. Review of Medical Microbiology and Immunology. 13th edition. Lange Medical Books. 2014
- Abbas A., Lichtmann A., Cellular and Molecular Immunology 10th edition, Elsevier, 2021
- J.D.M.Edgar, Immunology, 2013
- H. Chapel, et al. Essentials of Clinical Immunology, 7th edition, Wiley-Blackwell, 2022

C. Scientific journals

J of Immunology and Infectious diseases,
J of Immunology,
J of Immunological Methods,
Frontiers in Immunology
J of Immunoassay and Immunochemistry

6.3 6th Semester Courses

CLINICAL BIOCHEMISTRY OF METABOLIC AND DEGENERATIVE DISEASES (CLINICAL CHEMISTRY III)

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1906031 285-1906032	SEMESTER	6th
COURSE TITLE	**CLINICAL BIOCHEMISTRY OF METABOLIC AND DEGENERATIVE DISEASES (CLINICAL CHEMISTRY III)**		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g., lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		WEEKLY TEACHING HOURS	CREDITS
Theory		3	3
Laboratory practice		2	2
		5	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Course		
PREREQUISITE COURSES:	YES 1. Biochemistry I (Structure & Function of Biomolecules) 2. Biochemistry II (Macromolecules Metabolism - Disorders)		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-		
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3676,		

	https://moodle.teithe.gr/enrol/index.php?id=3675, http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.
Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To describe the pathophysiology of liver function.
- To describe the pathophysiology of renal function and the effects of renal failure.
- To describe pancreatic function and homeostasis of the body's glucose as well as the important role of insulin in carbohydrate metabolism.
- To describe the metabolism of purines and lipids and the biological markers associated with their metabolic disorders, as well as their changes in various pathological conditions.
- Be familiar with the biochemical diagnostic tests applied in the diagnosis of liver, kidney disorders, carbohydrate, lipid and purine metabolism disorders.

2. Skills

- Understand the principles of laboratory biochemical methods applied in the diagnosis of liver, kidney disorders, disorders of carbohydrate, lipid and purine metabolism
- Perform diagnostic tests applied in the diagnosis of liver, kidney disorders, disorders of carbohydrate, lipid and purine metabolism.
- To qualitatively assess the laboratory tests for the determination of the above biochemical indicators.
- Provide information on the correct procedure for the collection maintenance and transport of biological samples.
- Perform the above diagnostic tests with accuracy and repeatability using a simple photometer, semi-automatic analyzer, automatic biochemical analyzer and dry chemistry analyzers or protein electrophoresis device and densitometer.
- Check the analyzer parameters and verify their compliance with diagnostic kit specifications.
- Configure the analyzer parameters according to the diagnostic kit available.
- Detect evidence of unreliable determination and provide actions to be taken to ensure reliability.

3. Competence

- To perform experimental work using new technologies to groups of first-year students or groups of secondary school students.
- Develop critical thinking and the ability to identify and solve problems in qualitative evaluation of laboratory tests (glucose, insulin, glucose tolerance test, glycosylated hemoglobin, etc.) working alone or in groups.
- Become familiar, in assessment and application of quantitative determinations of biochemical markers using various biochemical laboratory instruments.
- Understand which factors can lead to false results when applying the above determinations and have the skills to select methods for preventing false results.
- Be able to compare different techniques and different diagnostic kits available for the above determinations with regard to their suitability depending on the available instruments, likelihood of false results, suitability for specific population groups, etc..

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

- Search, analysis and synthesis of data and information, using the necessary technologies
- Working independently
- Teamwork
- Work in an interdisciplinary environment
- Work in an international environment
- Production of new research ideas

3) SYLLABUS

THEORY

- Operation of photometer and biochemical analyzer.
- Statistical quality control in clinical analyses.
- Disorders of carbohydrate metabolism. Diabetes Mellitus, Gestational Diabetes (Routine and specific blood laboratory tests in the laboratory diagnosis).
- The kidneys and the laboratory control of their function.
- Plasma proteins and their electrophoresis.
- Lipid metabolism. Lipids and lipoproteins and biochemical laboratory monitoring of their metabolic disorders.
- Biochemical monitoring of liver function (Importance of these biochemical tests in the clinical diagnosis of liver disorder).
- Purine metabolism and the biochemical screening of uric acid.

LABORATORY

(In parentheses the percentage of participation of each module in the teaching of the Laboratory)

- General remarks on the quantification of biomolecules. Types and use of analytes. Control and parameter setting in end-point, two-point determinations, etc. (7.7 %)
- Accuracy – repeatability. Types of errors. Factors affecting the reliability of determinations. Method- dependent errors. Selection of methods. Reference methods (7.7%)
- Tests to check carbohydrate metabolism:
  - Laboratory application of photometric determination of glucose and checking of the accuracy and repeatability of the measurement
  - Use of a photometer and semi-automatic analyzer as a simple photometer. (7.7%)
  - Determination of glycosylated hemoglobin (column chromatography - use of a simple ion exchange column, Nykocard dry chemistry analyzer, demonstration of HPLC use) (7.7%)
- Tests to check lipid metabolism:
  - Quantitative determination of triglycerides. Application to a semi-automatic analyzer after control and modification of parameters. (7.7%)
  - Quantitative determination of total cholesterol, HDL and LDL cholesterol. Application on a semi-automatic analyzer after control and modification of parameters. (7.7%)
- Tests to check kidney function:
  - Quantitative determination of urea. Laboratory test for urea. (7.7%)
  - Quantitative determination of uric acid. Application to Reflotron (7,7 %)
  - Quantitative determination of creatinine. (7.7%)
- Liver function tests:
  - Laboratory determination of serum protein (7.7%)
  - Determination of albumin. Application to an automated biochemical analyzer for albumin, total protein and other determinations. (7.7%)
  - Serum protein electrophoresis and quantification of results using a densitometer. (7.7%)
  - Determination of bilirubin (7.7%)

The photometric determinations are carried out using a simple photometer, a semi-automatic analyzer and a dry chemistry analyzer of the Reflotron type.

An automated biochemical analyzer is used to perform multiple analyses on a large number of samples.

For each test, is given a description of the principle of the method applied in the laboratory, an indication of the factors which may influence the determination leading to false results and which are either

independent or dependent on the method of determination, a reference to other methods for the determination of the biomolecule and an indication of the main reasons why the determination is requested.

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In the Clinical Chemistry lab room, face to face.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Lectures and tutorials using audio-visual media, both in the theoretical and in the laboratory part.
• Use of the e-mail and the Department's website to communicate and inform students, respectively.
• Use of the e-class (moodle.teithe.gr) for the posting and circulation of scientific articles, lectures, useful links, anatomical images, questionnaires, information for attending conferences and seminars related to the course, etc.
• Video recording of the operation of analyzers/ laboratory exercises and posting of relevant videos on the asynchronous training platform.
• Creating electronic quizzes and posting them on the asynchronous learning platform.</td></tr>
<tr><td>TEACHING METHODS

The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.
The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td><table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>90</td></tr><tr><td>Laboratory practice</td><td>60</td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>150</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION

Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Theory
1. Written Assignment optional with public presentation (Graded and gives 20% to the final grade of the final theory exam).
2. Written final exam including:
✓ Assay questions type
✓ Multiple Choice questions
✓ Short Answer questions
Note: (1) is carried out as long as the circumstances allow it, such as the number of students, the workload of teachers, etc.

Laboratory
1. Assessment of students with theoretical and practical exercises in the laboratory (Not graded).
2. Weekly assignments submitted electronically on the asynchronous learning platform (moodle). Marking of errors individually or collectively, mandatory resubmission of the corrected ones in case of significant deficiencies in understanding (20% of the Lab grade).
3. Weekly electronic self-examination quizzes with time limitation (bonus of 0.1 of the Lab-grade on 10% of the best</td></tr>
</table>

	answers, per quiz. Up to 10 quizzes). 4. Mid-term examination in part of the Laboratory Exercises (in case of successful examination, possibility of exemption from part of the material in the final examinations) 5. Written/oral final exam with multiple choice, true/false, short answer questions. Note: The length and content of the assignments (2) and quizzes (3) may vary depending on the composition and number of students and the special conditions of the semester. The midterm exam (4) may not be given, depending on the specifics of the semester. Total course grade: Theory grade 60% + Laboratory grade 40%.

5) ATTACHED BIBLIOGRAPHY

A. Greek

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2. Ιατρική βιοχημεία, J. BAYNES, M. DOMINICZAK κωδικός βιβλίου στον Εύδοξο 42021
3. «Κλινική Χημεία ΙΙΙ, ΕΞΕΤΑΣΕΙΣ ΑΙΜΑΤΟΣ», Ιωαννίδη Ιωάννη, Εκδόσεις Γιαχούδη, ISBN 960-7425-42-1 set 960-7425-45-6, 2004, Θεσσαλονίκη. (ΕΥΔΟΞΟΣ: Βιβλίο [13173])
4. Κλινική χημεία. Marshall W, Bangert S. Κωδικός Ευδόξου: 13256565. Εκδόσεις Broken Hill Publishers Ltd 2000
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6. Lecture notes στη Κλινική βιοχημεία, Κωδικός Ευδόξου: 22768511. Εκδόσεις Παρισιάνος 2010.
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9. Εργαστήριο: «Κλινική Χημεία ΙΙΙ, ΕΞΕΤΑΣΕΙΣ ΑΙΜΑΤΟΣ, Εργαστήριο», Ιωαννίδη Ιωάννη, Εκδόσεις Γιαχούδη, ISBN 960-7425-59-6 set 960-7425-62-6, 2002, Θεσσαλονίκη(ΕΥΔΟΞΟΣ: Βιβλίο [13893].

6.4 6th Semester Courses

HEMATOLOGICAL MALIGNANCIES - HEMOSTASIS (HEMATOLOGY III)

COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1906041 285-1906042	SEMESTER	6th
COURSE TITLE	**HEMATOLOGICAL MALIGNANCIES - HEMOSTASIS (HEMATOLOGY III)**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g., lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Theory	3	4
Tutorial		
Laboratory practice	2	2
	5	6

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		
COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Course	
PREREQUISITE COURSES:	Hematology I	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK	
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-	
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3678, https://moodle.teithe.gr/enrol/index.php?id=3677, http://www.mls.teithe.gr	

(2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.
Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To describe the pathophysiology, etiology, clinical picture, laboratory diagnosis and treatment of blood neoplasms.
- To describe the physiology and laboratory investigation of hemostasis.
- To describe the pathology of hemostasis and what causes the hemorrhagic and thrombophilic disposition.
- To know the origin of blood cells.
- Recognize the laboratory findings that contribute to the diagnosis of blood neoplasms.

2. Skills

- Study peripheral blood smears and identify immature cells.
- To perform and evaluate the laboratory control of all phases of hemostasis.
- Recognize and evaluate the laboratory findings that contribute to the diagnosis of blood neoplasms.

3. Competence

- To understand the pathophysiology and clinical picture of blood neoplasms
- To know the contribution of the study of bone marrow smears to the identification of blood neoplasms
- To understand the mechanism of hemostasis
- To know pathological conditions of hemostasis
- Origin of blood cells

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations Decision-making Working independently Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas	Showing social, professional and ethical responsibility and sensitivity to gender issues Criticism and self-criticism Production of free, creative and inductive thinking …… Others… …….

- Search, analysis and synthesis of data and information, using the necessary technologies

- Working independently
- Teamwork
- Work in an interdisciplinary environment
- Work in an international environment
- Production of new research ideas

(3) SYLLABUS

THEORY

- Origin of blood cells.
- Neoplasms of the hematopoietic tissue (etiology, pathophysiology, laboratory diagnosis, treatment).
- Hemostasis (Physiology, laboratory investigation).
- Pathology of hemostasis (Hemorrhagic and thrombophilic disposition).

LABORATORY

- The contribution of the full blood count (FBC) to the laboratory diagnosis of blood neoplasms
- Peripheral blood cell morphology in blood neoplasms
- Bone marrow study of blood neoplasms
- Laboratory control of hemostasis as a whole
- Laboratory control of primary hemostasis
- Basic Coagulation mechanism tests (prothrombin time, partial thromboplastin time, fibrinogen measurement)
- Fibrinolysis laboratory test
- Second-line coagulation tests

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the Haematology lab room, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	• Lectures and tutorials using audio-visual media, both in the theoretical and laboratory part. • Use of the e-mail and the Department's website to communicate and inform students, respectively. • Use of the e-class (moodle.teithe.gr) for the posting and circulation of scientific articles, instructions, lectures, useful links, anatomical images, questionnaires, information for attending conferences and seminars related to the course, etc.
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Activity / Semester workload Lectures: 120 Laboratory practice: 60 Tutorial: Course total: 180
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other	Theory 1. Written Assignment optional with public presentation (Graded and gives 20% to the final grade of the final theory exam). 2. Written final exam including: ✓ Assay questions type ✓ Multiple Choice questions ✓ Short Answer questions Note: (1) is carried out as long as the circumstances allow it, such as the number of students, the workload of teachers, etc. Laboratory 1. Assessment of students with theoretical and practical

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	exercises in the laboratory (Not graded). 2. Weekly exercises and assignments submitted daily (Not graded). 3. Mid-term exam to the laboratory exercises section (in case of a successful exam, possibility of exemption from part of the material in the final exams) 4. Written/ oral final exam with multiple choice questions, short answer questions and case study questions Note: (2) and (3) are carried out as long as the conditions allow, such as the number of students, the workload of teachers, etc. The mid-term exam (4) may not take place, depending on the special circumstances of the semester. Total course grade: Theory grade 60% + Lab grade 40%

(5) ATTACHED BIBLIOGRAPHY

1. Εργαστηριακή Αιματολογία Νεοπλασίες του Αίματος , Αιμόσταση, Έλεγχος Ποιότητας , Βαγδατλή Ελένη Εκδότης: ΑΛΤΙΝΤΖΗΣ Α. Αθανάσιος
2. Εργαστηριακή Αιματολογία. Γεωργούλης Ι. Ε Εκδότης Ροτόντα
3. Πρακτική Αιματολογία Bain, Bates, Laffan, Lewis Εκδότης: ΛΑΓΟΣ ΔΗΜΗΤΡΙΟΣ
4. WILLIAMS ΑΙΜΑΤΟΛΟΓΙΑ Lichtman Marshall, Prchal Josef, Kaushansky Kenneth, Levi Marcel, Burns Linda, Armitage James (Εκδότης): BROKEN HILL PUBLISHERS LTD
5. Πρακτικό εγχειρίδιο μικροσκοπικής αιματολογίας Fritz Heckner, Mathias Freund Εκδότης: Παρισιάνου Α.Ε.

6.6. 6th Semester Courses

LABORATORY MEDICAL CYTOLOGY
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285 – 190606	**SEMESTER**	**6th**
COURSE TITLE	**LABORATORY MEDICAL CYTOLOGY**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Laboratory practice		2	3
Total		2	3
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory course		
PREREQUISITE COURSES:	- BASIC HISTOLOGY & METHODS OF STUDY - GENERAL EMBRYOLOGY (THEORY & LABORATORY PRACTICE) - GENERAL PATHOLOGY (THEORY & LABORATORY PRACTICE)		

LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3681 http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

LABORATORY PRACTICE

1. Knowledge

- To apply methods of obtaining cytological samples based on exfoliation - scraping -washing of excretory ducts and cavities - Fine needle aspiration biopsies (FNAB) with or without ultrasound guidance
- To know preparative techniques of Conventional Cytology and Liquid based cytology (LBC)
- To apply the fixation of cytological samples by spraying or dipping in alcohols (ethanol 95^0 and methanol 100^0)
- To perform cytochemical stain Papanicolaou (Pap stain) automatically or manually and other cytochemical (Giemsa - Pas stains) and immunocytochemical stains

2 Skills

- To understood the basic principles of the techniques - obtaining and staining cytological samples - with the methods of conventional cytology and liquid phased cytology-
- To be familiar with the microscopic observation and description of cytological specimens
- To have understood and reliably performed the technical processing and staining of cytological samples
- To have constant familiarity with the terminology of applied techniques and the terminology of Medical diagnoses
- To know the correct procedure for receiving - recording and storing cytological samples to apply principles of protection of personnel from biological and chemical hazards in the workplace
- to be able to microscopy the cytological material they processed and to assess the quality and the result of the technical work they carried out.

3. Competence

- To acquire familiarity with the objects of Diagnostic cytology and the use of new technologies To develop collaborations in groups in order to produce research methods for the benefit of medical science
- To gain experience in the subjects of Diagnostic cytology and the use of new technologies to develop cooperation in groups with the aim of producing research work and specialized research methods for the benefit of Medical science

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma

Supplement and appear below), at which of the following does the course aim?	
Search for, analysis and synthesis of data and information, with the use of the necessary technology *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*
Search for, analysis and synthesis of data and information, with the use of the necessary technology Adapting to new situations Working independently Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project planning and management Respect for the natural environment	

(3) SYLLABUS

Laboratory

Methods of obtaining a cell sample based on: Exfoliation - Scraping - Washing excretory ducts /cavities - Use of a brush- Categories of cytological samples (FNA- lavage - cellblock - fluids)- Preparation techniques (Conventional - Liquid based cytology- Centrifugation) -Fixation (Principles – Methods) - Stains: Cytochemical / Immunocytochemical-Molecular techniques with application in Cytopathology - Cell sample observation systems (OM/HM)-Automated Observation Systems - Flow Cytometry – Morphometry -Diagnostic evaluation of Cytological methods -Diagnostic Quality Assurance in Cytology – Teaching and Learning methods - evalluation -Tests: Cytochemical / Immunocytochemical- Molecular techniques with application in Cytopathology.

4)TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	***Activity*** / ***Semester workload*** Laboratory — 90 Course total — 90
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other*	Laboratory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions 2. Written Assignment, optional, with oral presentation in class (Graded and gives 10% to the final grade of the final theory exam).

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors.

5) ATTACHED BIBLIOGRAPHY

Ελληνική

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6.7. 6th Semester Courses

Practical Exercise (Internship) I / Clinical-Laboratory Training
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE		**SEMESTER**	**6th**
COURSE TITLE	**Practical Exercise I / Clinical-Laboratory Training**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Practical Exercise I/ Clinical-Laboratory Training (2 months = 320 hours)	40	15 *
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, **Optional Course**
PREREQUISITE COURSES:	YES 1. The 2/3 of the total courses of semesters 1st-5th 2. All the specialty courses of semesters 1st-5th 3. The laboratory section of all courses.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:
The purpose of the students' internship is to train them within the field of knowledge of the department they are attending.
The Practical Training I /Clinical-Laboratory Training includes the training in departments of hospitals or diagnostic centers, clinics and generally in places of their discipline in Greece or abroad. Part of the Internship/Clinical-Laboratory Training may also be carried out in research laboratories of a similar discipline.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

3) SYLLABUS

During the **Optional** Internship/Clinical-Laboratory Training I, in departments of hospitals or diagnostic centers, students should be trained in different fields and

become familiar with basic technical tests performed in each field. These areas may be biochemical, hematological, microbiological, histopathology, cytology, molecular diagnostics, serological-immunological, blood donation.

The **optional** traineeship corresponds to 2 months of five-day work (320 hours) and is carried out in either public or private sector. The number of hours of practical training per day is set at 8. The optional Internship/ Clinical- laboratory Training I, takes place after the end of the completion of the requirements of the 6th semester (8 hours x 5 days x 8 weeks during the summer months or equivalent).

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face training.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>During the internship students are supervised by the internship supervisor, who is appointed by the Department for this purpose. The members of the training staff who will be assigned to supervise student interns visit the internship sites, are informed about the assignment, monitor their performance and cooperate in problem solving, both with the trainees themselves as well as with the hospital staff member responsible.
Train in using all relevant technologies in the internship/laboratory training areas.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Clinical / Laboratory training I</td><td>320</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>320 *</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Each trainee keeps a trainee book in which he/she notes each week the tasks he/she has been engaged in, as well as a brief description of the tasks assigned to him/her in the workplace. Each weekly entry shall be checked and signed by the hospital or internship site supervisor responsible for monitoring the trainees. The trainee's competency is evaluated by the internship site supervisor and the academic supervisor.
The overall course grade shall be a 5 out of the total course grade (10), of internship competency, as certified by the Internship Lab Supervisor and the academic supervisor. For the balance of their grade, trainees are examined by a 3-member committee, on questions on practical issues related to day-to-day procedures in the internship laboratory area.

* According to the Internal Regulations of the I.H.U., the Work Load (WL) and ECTS of Optional Courses are not added to the WL and ECTS of the semester, nor to the total ECTS required for the degree and their grade does</td></tr>
</table>

	not contribute to the final grade of the degree. However, optional courses, their grade and ECTS are included in the transcript of records and the diploma supplement.

5) ATTACHED BIBLIOGRAPHY

7.1. 7th Semester Courses

Immunology II

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1907011 285-1907012	SEMESTER	7th
COURSE TITLE	**Immunology II**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Lectures (Theory)	3	4
Laboratory practice	2	2
	5	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3640, https://moodle.teithe.gr/enrol/index.php?id=3639 http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area

- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and

Appendix B

- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1.Knowledge

- Essentials of Major Histocompatibility Complex
- Essentials of hypersensitivity reactions
- Essentials of Immunology of Infections
- Essentials of Autoimmunity and autoimmune diseases
- Diagnostic immunology using different serological methods

2. Skills

•To understand Major Histocompatibility Complex
•To understand the types of hypersensitivity reactions
•To understand the immunology of infections and host immune response against microorganisms
•To understand autoimmunity and auto-immunodeficiencies
•To apply immunological diagnostic methods
•To acquaint relevant terminology
• To apply principles of personal and environmental protection against microorganisms
•To apply techniques and methods of detection of antibodies, antigens and proteins in body fluids.

3. Competence

•To evaluate good practice of immunology techniques
• To be able to present using new technologies work-experiments to groups of first-year students.
• To develop critical thinking and ability to identify and solve problems, working alone or in groups.
• To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility
Decision-making	and sensitivity to gender issues
Working independently	Criticism and self-criticism
Team work	Production of free, creative and inductive thinking
Working in an international environment	……
Working in an interdisciplinary environment	Others…
Production of new research ideas	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

Theory

- Major Histocompatibility Complex
- Hypersensitivity reactions.

- Immunology of Infections.
- Auto immunity
- Angiitis.
- Immunodeficiencies – HIV, AIDS.
- Immunology of transplantations.
- Immunology of cancer.

LABORATORY

Laboratory methods and techniques in Immunology (Agglutination reaction, Coombs test, Complement fixation test, Indirect hemagglutination, Western Blot Assay, nephelometry, turbidimetry, Direct and Indirect Immunofluorescence, ELISA, PCR, CLEA). Detection of autoantibodies, viral antibodies (ANA, anti-DNA, ASMA, anti-ENA).

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Activity / Semester workload Lectures 120 Laboratory practice 60 Course total 180
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Theory 1.Personal project counting 20% of the final grade Written final exam may include: - Multiple Choice questionnaire - Short answer questions Laboratory 1. Theoretical an practical exercises (non graded) 2. Written final exam may include: - Multiple Choice questionnaire - Short answer questions - Laboratory results inerpretation

5) ATTACHED BIBLIOGRAPHY

-Recommended References:

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- H. Chapel, et al. Essentials of Clinical Immunology, 7th edition, Wiley-Blackwell, 2022
- Thomas Kindt et al. Kuby Immunology, AMA 2023

C. Scientific journals

J of Immunology and Infectious diseases,
J of Immunology,
J of Immunological Methods,
Frontiers in Immunology
J of Immunoassay and Immunochemistry

7.2 7th Semester Courses

CLINICAL CHEMISTRY IV (LABORATORY ENDOCRINOLOGY AND SPECIAL BIOCHEMICAL TESTS)

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1907021 285-1907022	SEMESTER	7th
COURSE TITLE	CLINICAL CHEMISTRY IV (LABORATORY ENDOCRINOLOGY		

	AND SPECIAL BIOCHEMICAL TESTS)		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		WEEKLY TEACHING HOURS	CREDITS
	Tutorials (Theory)	3	4
	Laboratory practice	3	2
		3	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE general background, special background, specialised general knowledge, skills development	Compulsory course, Specialty Course		
PREREQUISITE COURSES:	BIOCHEMISTRY I, BIOCHEMISTRY II		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3643, https://moodle.teithe.gr/enrol/index.php?id=3642 http://www.mls.teithe.gr		

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:
Knowledge
• Describe the biological action and metabolism of hormones.
• To describe the principles and the technical part of the methods used for the determination of hormones in laboratory practice.
• Recognize the role of hormones and the changes that occur in the biochemistry of endocrinological diseases.
• To know the new bone markers and their importance in bone diseases.
• To describe the metabolic aspects of malignant diseases and their laboratory diagnosis by finding biochemical markers in the patient's blood.
2. Skills
• To apply methods of measuring concentrations of hormones, cancer markers in biological fluids.
• To evaluate methods of measuring concentrations of hormones, cancer markers in biological fluids.
• To compare the diagnostic methods used to determine hormones, cancer markers in biological fluids.
• To understand the value of the reference methods used for the laboratory diagnosis of diseases of the endocrine glands.
• To be able to inform about the correct procedure for receiving, maintaining and transporting biological samples.
3. Competence
• To be able to present using new technologies work-experiments to groups of first-year students or to groups of secondary school students.
• To develop critical thinking and ability to identify and solve problems when performing hormonal tests working alone or in groups.
• To acquire familiarity with the assessment and application of quantitative determinations of hormones and cancer using various biochemical laboratory instruments.

• To be able to strengthen the acquired knowledge with the current modern laboratory techniques for determining biological indicators in biological fluids. • To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.
General Competences Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim? Search for, analysis and synthesis of data and information, with the use of the necessary technology Adapting to new situations Decision-making Working independently Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project planning and management Respect for difference and multiculturalism Respect for the natural environment Showing social, professional and ethical responsibility and sensitivity to gender issues Criticism and self-criticism Production of free, creative and inductive thinking …… Others… …….
Search for, analysis and synthesis of data and information, with the use of the necessary technology Adapting to new situations Working independently Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project planning and management

3) SYLLABUS

THEORY

Determination and clinical significance of changes in serum hormone concentration as indicators of pathological conditions. Metabolic aspects of malignant diseases. Determination and clinical significance of changes in serum concentration of cancer markers. New bone markers and their significance in bone diseases (Osteoporosis). Actions of Vitamin D. Contribution of vitamin D to bone metabolism. More frequent endocrinopathy (pituitary, hypothalamic, pineal, thyroid, parathyroid, adrenal, gonadal and gastrointestinal**.** Diseases of the parathyroid glands and calcium homeostasis (histology of the parathyroid glands, laboratory investigation of hormone secretion and disorders during disease. Hormonal actions and clinical manifestations of disorders of the hypothalamus and pituitary gland. Diseases of the thyroid gland (Normal and pathological thyroid secretion).Pathophysiology of hyperthyroidism, types of hyperthyroidism (Graves' disease), hypothyroidism, thyroiditis (Hashimoto's), goitre, nodules and neoplasms. Diseases of the male and female reproductive system (Cell biology and hormone secretion).

LABORATORY

Special laboratory tests for the determination of hormones, cancer markers, vitamins (ELISA, RIA, Chemiluminescence, electrochemiluminescence, fluorescence polarization, HPLC, Mass Spectrometry). Learning the principles of operation and demonstration of chemiluminescence, fluorescence polarization machines. Determination of TSH, T4, T3, cortisol hormones by ELISA in normal and pathological samples. Compare results with true value and determine error rate and causes of errors. Determination of indicators of bone production - resorption (Osteoporosis). Laboratory control of hypertension. Laboratory test of adrenal cortex. Laboratory diagnosis of ovarian and cycle disorders.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements,	

Activity	Semester workload
Lectures	120
Laboratory practice	60

clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Course total: 180
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions Laboratory 1. Theoretical an practical exercises (non graded) 2. Written final exam may include: - Multiple Choice questionnaire - Short answer questions - Laboratory results interpretation

5) ATTACHED BIBLIOGRAPHY

A. Greek

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2. Κλινική Βιοχημεία κωδικός βιβλίου στον Εύδοξο 42049, έκδοση 4ηέκδ.2010, συγγραφείς Gaw Allan, Cowan Robert A., O'Reilly Dennis S. J., Stewart Michael J., Shepherd James, διαθέτης (Εκδότης) ΠΑΡΙΣΙΑΝΟΥ ΑΝΩΝΥΜΗ ΕΚΔΟΤΙΚΗ ΕΙΣΑΓΩΓΙΚΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΙΑ ΕΠΙΣΤΗΜΟΝΙΚΩΝ ΒΙΒΛΙΩΝ
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B. English

1. Βιοχημεία Stryer (6ηέκδοση 2006)
2. Concepts in Clinical Pharmacokinetics, J. DiPiro, R. Blouin, J Pruemer, ASHP, 1998
3. Clinical Pharmacokinetics, M Rowland, T.N. Tozer, LEA-FEBIGER, Philadelphia, 2000
4. Basic Clinical Pharmacokinetic, M. Winter, Lippincott Williams-Wilikins, 2003Α. Ελληνική

7.3 7th Semester Courses

MEDICAL PARASITOLOGY

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-1907031 285-1907032	SEMESTER	7th

COURSE TITLE	**MEDICAL PARASITOLOGY**	
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Theory	2	4
Tutorial	1	
Laboratory practice	2	2
	5	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		
COURSE TYPE general background, special background, specialised general knowledge, skills development	Compulsory course Specialty Course	
PREREQUISITE COURSES:	BIOCHEMISTRY I, BIOCHEMISTRY II	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK	
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES	
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3643, https://moodle.teithe.gr/enrol/index.php?id=3642 http://www.mls.teithe.gr	

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:
Knowledge
• To recognize the concept of parasites from protozoa, metazoa and ectoparasites.
• To describe the morphology, biological cycle, clinical manifestations, epidemiology and pathogenesis of the most important human parasites.
• To describe the parasite-human interactions and their effects on the induction and manifestation of disease.
• To recognize the most important pathogenic parasites that cause infections, how they are transmitted, how they multiply and how they are treated.
• To recognize the relevant terminology and the internationally used abbreviations in the diagnostic orders for the diagnosis of parasitic diseases.
• Describe the prevention of parasitic infections through immunization.
• To describe the laboratory diagnosis of parasites by applying various methods (culture, serological, molecular methods, etc. regarding the isolation, detection and identification of parasites).

2. Skills
• To have understood the principles of laboratory diagnosis of parasitic infections and to have familiarized themselves with isolation, culture, identification/typing detection methodologies as well as the correct execution of laboratory techniques for the diagnosis of human parasites.
• Apply the diagnostic methods used in the diagnosis of infestations with an emphasis on new technologies.
• To be able to inform about the correct procedure for receiving, maintaining and transporting biological samples.
• To apply principles of personal and environmental protection from parasites.

3. Competence
• To assess the correct performance of the laboratory techniques for the diagnosis of human parasites.
• To be able to present using new technologies work-experiments to groups of first-year students or to groups of secondary school students.
• To develop critical thinking and ability to identify and solve problems, working alone or in groups.
• To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.
• To qualitatively assess the methods of diagnosis of parasites (sensitivity, specificity).

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

THEORY
Introduction, generally about parasites, Classification of protozoa and worm. Epidemiology of parasites. Generally for the diagnosis of diseases caused by parasites.
General about protozoa. Intestinal protozoa: amoebae (Entamoeba spp), flagellates (Giardia lamblia), coccidia (Cryptosporidium spp, Cyclospora cayetanensis, Cystoisospora belli), ciliates (Balantidium coli).
Blood protozoa: Plasmodium spp, Babesia spp, Trypanosoma spp.
Tissue protozoa: Toxoplasma, Leishmania, Tissue amoebae (Naegleria, Acanthamoeba, Balamuthia).
General about worms – epidemiology Classification – general characteristics of worms.
Roundworms: Tapeworms: Taenia spp, Diphyllobothrium spp, Echinococcus spp, Hymenolepis spp.
Intestinal tapeworms: Fasciolopsis, Heterophyes, Metagonimus. Blood tapeworms: Schistosoma spp.
Tissue tapeworms: Clonorchis, Opisthorchis, Fasciola spp, Paragonimus spp.
Intestinal nematodes: Enterobius vermicularis, Ascaris lumbricoides, Trichuris trichiura, Ancylostoma spp, Necator americanus, Strongyloides stercoralis, Trichostrongylus sp, Toxocara spp, Gnathostoma spp, Anisakis spp.
Blood and tissue nematodes: Filariae: Wuchereria bancrofti, Brugia malayi, Loa loa, Onchocerca volvulus, Mansonella spp .
Arthropods of medical importance, ectoparasites. Antiparasitic drugs, vaccines, drugs.

LABORATORY
Diagnostic methods in parasitology, demonstration of methods in the laboratory:
• Parasitological examination of feces, methods of enrichment of feces by centrifugation and flotation.
• Blood smear (thin and thick drop) and preparation of preparations for microscopy
• Technical staining of biological samples: feces, vaginal, blood and CSF for the diagnosis of protozoan and worms infestations.
• Serological methods and molecular methods for the diagnosis of parasites
II. Observation of preparations under the microscope:
• Intestinal protozoa: amoebae (Entamoeba spp), flagellates (Giardia lamblia), coccidia (Cryptosporidium spp, Cyclospora cayetanensis, Cystoisospora belli), ciliates (Balantidium coli).
• Intestinal nematodes: Enterobius vermicularis, Ascaris lumbricoides, Trichuris trichiura, Ancylostoma spp, Necator americanus, Strongyloides stercoralis, Trichostrongylus sp, Toxocara spp, Gnathostoma spp, Anisakis spp.
• Roundworms: Tapeworms: Taenia spp, Diphyllobothrium spp, Echinococcus spp, Hymenolepis spp.

• Blood protozoa: Plasmodium spp, Babesia spp, Trypanosoma spp. • Tissue protozoa: Toxoplasma, Leishmania, Tissue amoebae (Naegleria, Acanthamoeba, Balamuthia). • Bloodworms: Schistosoma spp. • Blood and tissue nematodes: Filariae: Wuchereria bancrofti, Brugia malayi, Loa loa, Onchocerca volvulus, Mansonella spp.

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In the classroom, face to face.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Basic software (windows, word, power point, the web, etc.).
Support of learning process through the electronic platform / e-class</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>110</td></tr>
<tr><td>Laboratory practice</td><td>70</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>180</td></tr>
<tr><td></td><td></td></tr>
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<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Theory

1. Written final exam may include:
- Multiple Choice questionnaire
- Short answer questions

Laboratory
1. Theoretical an practical exercises (non graded)
2. Written final exam may include:
- Multiple Choice questionnaire
- Short answer questions
- Laboratory results inerpretation</td></tr>
</table>

5) ATTACHED BIBLIOGRAPHY

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7.4. 7th Semester Courses

HYGIENE

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190704	SEMESTER	7th
COURSE TITLE	**Hygiene**		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		WEEKLY TEACHING HOURS	CREDITS
Lectures (Theory)		2	5
Laboratory practice		-	
		2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Course		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=2045 http://www.mls.teithe.gr		

2) LEARNING OUTCOMES

Learning outcomes The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described. Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To understand the fundaments of preventive and community medicine.
- To understand the Measures of risk of health. Monitoring tools Measures of disease frequency: prevalence and incidence.
- To understand the Mechanisms of action and methods of prevention of diseases.
- To know the Fundaments of personal and community hygiene.I
- To know about Hygiene of food, water and air.
- To understand Infectious Diseases-Transmission. Infection and resistance.
- In case of epidemics to know the policy and planning for epidemics
- To know about Vaccination of the population.
- To know the responsible microorganisms of the Diseases and methods of prevention.

2. S k i l l s

- To apply personal hygiene and know how to use monitoring tools
- To understand mechanisms of allergies
- To know how to use the scientific terminology

3. C o m p e t e n c e

- To be able to present using new technologies work-experiments to groups of first-year students.
- To develop critical thinking and ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility
Decision-making	and sensitivity to gender issues
Working independently	Criticism and self-criticism
Team work	Production of free, creative and inductive thinking
Working in an international environment	……
Working in an interdisciplinary environment	Others…
Production of new research ideas	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

Fundaments of preventive medicine or community medicine. Division of health. Measures of risk of health. Monitoring tools Measures of disease frequency: prevalence and incidence. Mechanisms of action and methods of prevention. Fundaments of personal and community hygiene. Population Hygiene. Hygiene of food, water and air. Infectious Diseases-Transmission. Infection and resistance. In case of epidemics application of governmental policy and methodology for epidemics Allergies. Vaccination of the population. Diseases and methods of prevention.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>60</td></tr><tr><td>Laboratory practice</td><td>-</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>60</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions

5) ATTACHED BIBLIOGRAPHY

-Recommended References:

A. Greek references

- Αρβανιτίδου-Βαγιωνά Μ. Υγιεινή, 2η έκδοση. University Studio Press, Θεσσαλονίκη, 2009.
- TortoraJ. G., Funke R.B., CaseL.Chr. Εισαγωγή στην Μικροβιολογία, 2η ελληνική έκδοση. Γενική Επιμέλεια Α. Τσακρής . Broken Hill Publishers LTD. Εκδόσεις Πασχαλίδης Π.Χ., 2017.

B. English references

- Mark Gladwin, William Trattler, C.Scott Mahan. Clinical Microbiology Made Ridiculously Simple. 6 edition. Medmaster 2014.
- Elmore, Wild et al. Jekel's Epidemiology, Biostatistics, Preventive Medicine, and Public Health, Elsevier - Health Sciences Division, 5th edition, 2020
- David D. Celentano; Moyses Szklo Gordis Epidemiology, ed.6 Elsevier, 2019
- Grant S. Fletcher Clinical Epidemiology: The Essentials, ed.6 Kluwer

C. Scientific journals

Journal of Epidemiology and Community Health,
J of Antimicrob Chemotherapy,
J Glob Antimicrob Resist.,
Recent Pat Antiinfect Drug Discov,
Microb Drug Resist.,
New Microbiol.,
Eur J Clin Microbiol Infect Dis,
J of Clinical Microbiology

7.5. 7th Semester Courses

Clinical Microbiology

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190705	SEMESTER	7th
COURSE TITLE	**Clinical Microbiology**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Lectures (Theory)	2	5
Laboratory practice	-	
	2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Elective
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3648 http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1) Knowledge

- To understand and describe microorganisms responsible for human infections, its clinical symptoms and laboratory diagnosis
- To recognize and identify microbial resistance mechanisms against antimicrobials

2) Skills

- To understand the microbial pathogen mechanisms which induce human infections per system, clinical signs and symptoms as well as the laboratory diagnosis of the infections
- To understand microbial resistance mechanisms against antimicrobials

3) Competence

To acquaint scientific research in Clinical Microbiology, to write a paper, present a project.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

3) SYLLABUS

Theory

- Clinical Microbiology in practice
- Infections of respiratory system
- Infections of cardiovascular system
- Infections of gastrointestinal system
- Infections of urinary tract system
- Viral hemorrhagic fever
- viral infections of neurological system
- Congenital and perinatal infections
- Non- viral infections of neurological system
- Sexually transmitted diseases
- Exanthemata's infections
- Bacterial resistance against antibiotics
- Phenotypic and molecular screening of bacterial resistance

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	

Activity	Semester workload
Lectures	150
Laboratory practice	-
Course total	150

STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions

5) ATTACHED BIBLIOGRAPHY

-Recommended References:

A. Greek references

- Παπά-Κονιδάρη Α. και συν. Εγχειρίδιο Κλινικής Μικροβιολογίας. University studio press. Βιβλίο [77110323]
- P. Murray, K. Rosenthal, M. Pfaller: Ιατρική Μικροβιολογία
- Ι. Παπαπαναγιώτου, Β. Κυριαζοπούλου-Δαλαΐνα: Ιατρική Μικροβιολογία & Ιολογία. University studio press.
- Μαρία Χατζηδημητρίου. Αντοχές Εντεροβακτηριακών στα β-λακταιμικά. Αφοι Κυριακίδη2017 Βιβλίο [68374134]
- Δουμπόγιας Ι., Τσακρής Α. Κλινική Μικροβιολογία. University studio press.

B. English references

- Murray P, Rosenthal K, Pfealler M. Medical Microbiology. 7thed Elsevier 2012.
- Mark Gladwin, William Trattler, C. Scott Mahan. Clinical Microbiology Made Ridiculously Simple. 6th ed. Medmaster 2014.
- Warren Levinson. Review of Medical Microbiology and Immunology. 13th edition. LangeMedical Books. 2014.
- Jong, Stevens, Netter's Infectious Diseases 2nd edition, Elsevier, 2022

C. Scientific journals

J of Antimicrob Chemotherapy,
J Glob Antimicrob Resist.,
Recent Pat Antiinfect Drug Discov,
Microb Drug Resist.,
New Microbiol.,
Eur J Clin Microbiol Infect Dis, J of Clinical Microbiology

PHARMACOLOGY - TOXICOLOGY

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190706	**SEMESTER**	**7th**
COURSE TITLE	**PHARMACOLOGY - TOXICOLOGY**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	2	5
Total	2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Elective Course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3647, http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The course contains elements of pharmacology aiming at understanding drug action, metabolism, pharmacokinetics (absorption, distribution, excretion) and methods for determining drugs and their metabolism products.
In particular, the learning objectives include the understanding of the basic biochemical mechanisms of drug action and the mechanisms of their modification within the body into active, toxic or excretory products (biotransformation). In addition, the goal is to understand the effect

of the genome on the metabolism and activity of drugs, the concept of pharmacogenomic biomarkers and their determination methods.

Finally, the course contains fundamentals of toxicology with aiming to understanding the concept and types of toxicity and learn methods of toxicity evaluation and determination of toxic agents.

Upon completion of the course, students should:

Knowledge:

- know the concept of pharmaceutical target.
- know the pharmaceutical goals and the biochemical mechanism of action of the most common drugs (anti-diabetic, hypocholesterolemic, anti-inflammatory, anti-microbial, antiviral, anti-cancer, nootropics).
- know the concepts of pharmacokinetics and drug metabolism,
- know the concept of toxicity and methods for toxicity evaluation.

Competence:

- To be able to understand the concept of rational drug design
- To be able to understand the different methods of toxicity evaluation, how to choose an appropriate method and its limitations.
- To be able to understand the principle of drug determination methods and their limitations.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Working independently
Team work
Adapting to new situations
Decision-making
Working in an interdisciplinary environment
Production of new research ideas
Criticism and self-criticism

3) SYLLABUS

Categories of pharmaceutical targets (receptors, enzymes, ion channels, neurotransmitter systems) – rational drug design – evaluation of biological action.

Mechanism of action of anti-inflammatory & analgesics and methods of action evaluation.

Mechanism of action of hypolipidemic & antidiabetic drugs. Antiviral drugs.

Mechanism of action of antibacterials. Biological activity evaluation methods.

Antibiotic resistance

Neuropharmacology: Mechanism of action of drugs acting on the Central and Autonomic Nervous System

Anti-cancer drugs

Drug effects on normal tissues.

Pharmacokinetics (absorption, distribution, excretion of drugs)

Metabolism of drugs and xenobiotics

Pharmacogenomics

Biotechnological pharmaceuticals – gene therapy

Methods of determination of drugs

Toxicity - Monitoring of mitochondrial activity as an indicator of toxicity

Toxicity categories-Toxicity evaluation methods.

Methods for computational prediction of biological activity, pharmacokinetics and toxicity.

Methods for determining toxic agents

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	With face-to-face or online lectures.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Presentations and lectures using audio-visual media. • Use of e-class (moodle) for posting: - power point presentations, scientific articles, instructions, self-assessment quizzes, assignment and submission of assignments.
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	

Activity	*Semester workload*
Lectures using audio-visual media	150
Total	150

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	**Theory** Written final exam including: Multiple Choice Test Short Answer Questions Project assignment (optional)

5) ATTACHED BIBLIOGRAPHY

- Βιοχημική Φαρμακολογία. Μαρσέλος Μάριος και συν. Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών, 2015, ISBN: 978-960-603-372-2
- Φαρμακολογία. Page, Curtis, Sutter, Walker, Hoffman. Επιμέλεια Π. Γαλανοπούλου-Κούβαρη, Χ. Λιάπη. Εκδόσεις Π.Χ.Πασχαλίδης
- Casarett & Doull,s Βασική Τοξικολογία (2η έκδοση), Curtis, D. Klaasen, John B. Watkins, Επιμέλεια: Α. Γούλας, Ν. Ράικος, Χ. Σπηλιοπούλου, Σ. Τοπούζης, Εκδόσεις: ΠαρισιάνουΑ.Ε., 2015.
- Εισαγωγή στη Φαρμακοχημεία, Π.Ν. Κουρουνάκης, Θεσσαλονίκη 2014.
- Goodman and Gilman's. The pharmacological basis of therapeutics. MacMillan Publishing Co.
- Disposition of toxic drugs and chemicals in man, R.C. Baselt, Biomedical Pubilcations; 8th ed. 2008.
- Related articles in scientific journals.

7.7. 7th Semester Courses

QUALITY CONTROL / ORGANIZATION IN DIAGNOSTIC LABORATORIES
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285 – 190707	**SEMESTER**	**7th**
COURSE TITLE	**QUALITY CONTROL / ORGANIZATION IN DIAGNOSTIC LABORATORIES**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	2	5
Total	2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Elective Course
PREREQUISITE COURSES:	NO

LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=3649 http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

6) Knowledge

To apply quality control in the laboratories:

- Microbiological
- Neurophysiological (Electromyogram –Electroencephalogram)
- Hematologic
- Molecular diagnostics
- Clinical chemistry
- Biochemical
- Cytological
- Quality Assurance in Laboratory Control
- Procedures and Systems of External - Internal Control

7) **Skills**

- To understand the Organizational and Quality Control Σystems applied in medical laboratories, which are based on International Guidelines

8) Competence

- They will acquire knowledge in the subject of quality assurance of Medical Laboratories and the Methods / standards applied according to the knowledge subject of the Laboratories
- They will develop collaborations between joint laboratories in terms of the subject of study for the benefit of Medical Science and the National Health System

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Others…
…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment

Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

3) Sylabus

- Search - Analysis and Synthesis of data and informations using the necessary Technologies
- Autonomous work
- Teamwork
- Production of free creative and inductive thinking.

Theory

- Organization of Diagnostic Laboratories
- Quality and Safety with Application to Healthcare Teams
- ISO/IEC - General specifications for the effectiveness of Laboratory tests
- Quality Assurance (QA) - Quality Control (QC) - Standards
- Internal and External Quality Control Systems (CS)
- Standard internal and external quality control systems
- Precision error standard error coefficient
  Repeatability standard deviation
- Clinical Chemist's Quality Control Charts Laboratories
- Study of implementation and organization of international standard ISO quality control in Clinical Chemistry Hematology Cytology Microbiological Molecular Genetics

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	***Activity*** / ***Semester workload*** Lectures — 150 — — — — — — — — 150
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Theory 1. Written final exam may include: - Multiple Choice questionnaire - Short answer questions 2. Written Assignment, optional, with oral presentation in class (Graded and gives 10% to the final grade of the final theory exam). Note: (2) is carried out as long as the circumstances allow it, such as the number of students, workload of professors, and other factors.

5) ATTACHED BIBLIOGRAPHY

Ελληνική
Βελτιώνοντας την Ποιότητα στις Υπηρεσίες Υγείας , Κωσταγιόλας Πέτρος , Καϊτελίδου Δάφνη, Χατζοπούλου Μαρία 1η ‘εκδ/2008,Α. ΠΑΠΑΣΩΤΗΡΙΟΥ &ΣΙΑ Ι.Κ.Ε. ISBN: 978-960-7182-10-4
Κωδικός Βιβλίου στον Εύδοξο :9683

Ξενόγλωσση
Laboratory Quality Control and Patient Safery – Jeremie Gras, 1st Edition ,2017. De Gruyter Publications, IBN-13 :978-3110346176

7.8. 7th Semester Courses

Diploma Thesis (Bachelor's degree)
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE		**SEMESTER**	**7th & 8th**
COURSE TITLE	**Diploma Thesis (Bachelor's degree)**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)		5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Elective Course
PREREQUISITE COURSES:	YES The diploma/thesis is a one single course of 10 credits divided into two semesters of 5 credits each. The student must register the thesis in two consecutive semesters. Students are required to complete and take the final examination after the completion of the two semesters. Students who have completed the first six semesters of study and have successfully passed 2/3 of the courses in those semesters, may apply for the first declaration of the diploma/thesis.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=2164, http://www.mls.teithe.gr/?page_id=8078

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The thesis can be either literature-based or research-based.

The aim is to enable the student to be trained to:
Search for appropriate literature to cover a scientific topic.
To assess the validity of information and select valid sources upon which to rely.
To search for the most up-to-date publications on the subject.
To critically read the various sources and synthesize the information gathered.
To compose a review paper by citing information in a correct order and logical sequence.
Critically comment on different sets of conflicting information and formulate conclusions.
Make correct reference to bibliographical sources.

In order to do a research thesis, the student must learn to:
To write a research paper following the correct order: Theoretical part (Preface, Purpose, Bibliographical review-Scientific questions asked) Experimental part (Objective-Research & study design, Materials and Methods, Description and discussion of experimental results, Conclusions).
In collaboration with the supervisor:
Participate in the design of the experiments.
Perform experimental protocols carefully and consistently.
To predict and recognize various arising errors in the experimental processes.
Analyse and evaluate results
Discuss and compare experimental results with those in the literature
Make conclusions or suggest ways of investigating scientific conclusions

In addition, students should be trained to:
Prepare a power point presentation with: the main points of their work with emphasis on the most important ones, presented in the correct order, clearly and within the limits of time given.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management Respect for the natural environment

3) SYLLABUS

The diploma thesis must:

Address a topic relevant to their field of study.

Cover the subject adequately in a range of approximately 50 - 100 pages depending on the number of students collaborating on the thesis

It must have decent presence and a high level of quality and contain the most up-to-date bibliographic data.

- It should not include knowledge derived from a single source but should critically combine several literature sources.

- It should not contain a verbatim transcription of text by other authors. If this is deemed necessary and with the agreement of the supervisor, it should be placed in parentheses with the author's name and the corresponding reference.

The bibliographic data should include, inter alia, references to recent publications by other scientists, the most up-to-date relevant World Health Organization (WHO) reports, or the most recent guidelines of relevant Scientific Societies.

- The diploma thesis must critically combine literature data, such as searching for, reporting and annotating differences between studies that may be cited and present conflicting views.

- It must not be a copy of another author's work, in full or in part. Plagiarism is an act of misconduct sanctioned by law.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Access to the internet for appropriate bibliography. Internet usage for database exploitation Use of online and non-computer programs to produce and process data. Preparation of a PowerPoint presentation of the work	
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	***Activity***	***Semester workload***
	Face-to-face communication with the student facilitated by online communication. Internet use for literature research.	150
	Use of the required software for writing and presenting papers.	
	Use of electronic communication for continuous teacher-student contact.	
	Face-to-face communication with the student facilitated by online communication. Internet use for literature research.	

	Use of the required software for writing and presenting papers.	
	Course total	150
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	The Thesis is considered completed and examined after the completion of two semesters. A three-member examination committee is appointed for the examination and evaluation of bachelor's theses: The committee shall: A) Consider the thesis (B) attend the presentation C) ask questions and lastly D) give a grade to the thesis The grading of the thesis is based on the following criteria: (a) Excellence, correct use of scientific terminology and quality of the text. (b) use and integration of current literature (c) contribution to the development of new knowledge or updating of new scientific knowledge. (d) excellence of presentation (e) appropriate response to committee's questions If the thesis or the student's related knowledge and understanding of the topic is judged to be inadequate or receives a very low grade, the student may be given up to one month to make corrections and to better prepare and repeat the presentation for re-examination. Otherwise, a re-examination may take place in the next session of presentations.	

5) ATTACHED BIBLIOGRAPHY

8.1. 8th Semester Courses

Molecular Diagnostics
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-	**SEMESTER**	**8th**

	190801		
COURSE TITLE	**Molecular Diagnostics**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures		2	5
Total		2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Elective Course		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://exams-phym.the.ihu.gr/course/view.php?id=158 http://www.mls.teithe.gr		

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Molecular technology has been applied to diagnostic tests in recent years. Students in our department as graduates should be familiar with the basic techniques and practices that are now being applied in many diagnostic laboratories in both public and private Clinical Laboratory Science/Medical Technology institutions.
The goal of this course is to increase students' knowledge of both the purpose, principles and interpretation of molecular-based diagnostic tests.
Examples of applications of molecular assays are included in the course content as well as case studies illustrating the use and interpretation of molecular tests in patient care..
Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To understand and enhance their knowledge of molecular mechanisms that can be used in the diagnosis of human diseases of diverse causes
- Become familiar with and become fully aware of the specific features, procedures and rules governing the organization of a molecular diagnostics laboratory and the

application of the corresponding methods

- To understand and know the most up-to-date and effective molecular diagnostic methods used for the diagnosis of infectious diseases, genetic diseases and syndromes, metabolic diseases, neurodegenerative diseases, hematological diseases, etc.
- To understand and enhance their knowledge of the applications of molecular diagnostics according to causative factors and/or diagnostic field
- To understand the bioethical considerations in relation to the applications, opportunities, restrictions and potential consequences of molecular diagnostic and genetic manipulation techniques.

2. Skills

- Be in a position to identify and differentiate the appropriate molecular diagnostic methods suitable for use on a given pathological and/or biological specimen.
- Be in a position to apply the acquired knowledge in order to meet the challenges of developing technology in the field of molecular diagnostics and to understand the challenges of developing new methodologies.

3. Competence

- By having the knowledge in fundamental and modern molecular diagnostic techniques, they should be able to reinforce the acquired knowledge with the latest laboratory techniques of molecular diagnostics and to clearly understand the principles governing them.
- To develop critical thinking and problem-solving skills in the fundamental techniques of molecular diagnostics that are widely applied in the diagnosis of human diseases and disorders.
- Be able to collect, compose, analyze, information, ideas, concepts, problems and possible solutions in order to generate new research ideas, using the knowledge acquired in the course..

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

3) SYLLABUS

THEORY

- Common Techniques in Molecular Biology
- Nucleic acid extraction methods (DNA isolation, RNA isolation, measurement of nucleic acid quality and quantity)
- Analysis and Detection of Nucleic Acids (ELECTRONIC PACKAGING SYSTEMS,

ELECTRONIC PACKAGING EQUIPMENT, GEL LOADING, ANALYSIS SYSTEMS) Analysis and Marking of Nucleic Acids and Proteins (MAPPING WITH ENZYME LIMITATION, HYBRIDIZATION TECHNOLOGIES - PROBES, HYBRIDIZATION CONDITIONS - ROBUSTNESS, DETECTION SYSTEMS, INTERPRETATION OF RESULTS, ARRAY-BASED HYBRIDIZATION, DNA METHYLATION ANALYSIS TECHNOLOGY)

- Nucleic acid amplification (Polymerase Chain Reaction-PCR, Real-time Polymerase Chain Reaction-Real time PCR, Multiplex PCR, Transcription-based amplification systems, Ligase Chain Reaction, Branched DNA amplification)
- DNA Sequencing (Sanger DNA Sequencing, Automated Fluorescence Sequencing, Pyrophosphate Sequencing, Next Generation Sequencing, Bioinformatics, etc.)
- Chromosomal Structure and Chromosomal Mutations
- Gene Mutations (TYPES AND DETECTION OF GENE MUTATIONS, Gender Identification)
- DNA polymorphisms and their identification in humans (TYPES OF POLYMORPHISMS, RFLP ANALYSIS, STR TYPING BY PCR, Y-STR, DNA POLYMORPHISM, NUCLEOTIDE SINGLE NUCLEOTIDE POLYMORPHISMS-SNPs, MITOCHONODRIC DNA POLYMORPHISMS)
- Applications of molecular diagnostics in the detection of inherited diseases/predisposition (Molecular cytogenetics in molecular diagnostics, Detection of duplications and deficiencies in the genome, DNA microarrays and genetic diagnosis, Pre-implantation genetic diagnosis, The use of genetic locus databases in molecular diagnostics, etc.)
- Applications of molecular diagnostics in medical microbiology
- Applications of molecular diagnostics in medical parasitology
- Applications of molecular diagnostics in medical virology
- Applications of molecular diagnostics in Hematology
- Applications of molecular diagnostics in cytology
- Applications in Preventive Medicine
- Applications in Pathological Anatomy
- Applications in Pharmacogenomics
- Genetic Counselling and Bioethics in Molecular Diagnostics

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face. Lectures and tutorials using audiovisual media.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Basic software (windows, word, power point, the web, etc.). • Support of learning process through the electronic platform / e-class

TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Theory 1. Written final exam (100%) may include: - Multiple Choice questionnaire - Short answer questions - Matching questions - True-false questions with justification - Development-response questions - Problem solving

Activity	*Semester workload*
Lectures	150
Internet use for literature research.	
Literature study & evaluation	
Use the necessary software for paper writing and presentation, as well as for Interactive teaching	
Course total	150

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. Lewin's Βασικές Αρχές Γονιδίων. Krebs Jocelyn E., Goldstein Elliott S., Kilpatrick Stephen T. Εκδόσεις: Broken Hill Publishers Ltd, 1η 2022. Κωδικός Βιβλίου στον Εύδοξο: 102070105
2. Κλινική Βιοχημεία και Μοριακή Διαγνωστική-Βασικές αρχές. Σκορίλας Ανδρέας. Εκδόσεις: BROKEN HILL PUBLISHERS LTD, 1η, 2020. Κωδικός Βιβλίου στον Εύδοξο: 94643655
3. Εφαρμογές Μοριακής Διαγνωστικής. Πλαγεράς Π., Γεροβασίλη Α., Παπαϊωάννου Α. Εκδόσεις: BROKEN HILL PUBLISHERS LTD, 1η, 2011. Κωδικός Βιβλίου στον Εύδοξο: 13256969
4. Μοριακή διαγνωστική. Πατρινός Γ. Π., Ansorge Wilhelm. Εκδόσεις: Παρισιάνου Α.Ε., 1η, 2008. Κωδικός Βιβλίου στον Εύδοξο: 41544

B. English

1. Molecular Diagnostics. Patrinos George P. Elsevier Science, 3rd edition 2016. ISBN: 9780128029718
3. Molecular Diagnostics – Fundamentals, Methods and Clinical Applications. Lela Buckingham, Maribeth L. Flaws. Copyright ©2007 by F. A. Davis. (διατίθεται σε μορφή pdf στο διαδίκτυο).
4. http://www.justmed.eu/files/MolecularDiagnosticsFundamentalsMethodsandClinicalApplications.pdf

8thSemester Courses

PREVENTIVE MEDICINE
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190802	SEMESTER	8th
COURSE TITLE	**Preventive Medicine**		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		WEEKLY TEACHING HOURS	CREDITS
Theory		2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Elective		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3683, http://www.mls.teithe.gr		

2) LEARNING OUTCOMES

Learning outcomes The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described. Consult Appendix A • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes
This course aims to enable students to: • A) Understand the concept of disease prevention, the importance and its contribution to the community.

- B) Understand the disease-causing agents, their mechanisms of action and the prevention methods.
- C) Be familiar with the prevention of chronic diseases such as coronary heart disease etc., malignant neoplasms, accidents and injuries, infectious diseases.
- D) Be aware of food, water, air and soil pollution preventions measures.
- E) The infectious or contagious diseases, the transmission mode of infectious agents, infections and resistance.
- F) Implement regulations of personal hygienic behavior and State methodology if an infectious epidemic may occur.
- G) Understand allergy and anaphylaxis.
- H) Be familiar with oxidative stress
- I) Acknowledge the related terminology and internationally used abbreviations for international organizations, diseases, vaccines, immune serums, etc.,
- J) Be familiar with general population immunization.

Upon completion of the course students will have the knowledge of:

- The prevention of disease, its importance and its contribution to society.
- The pathogenic agents, mechanisms of action and prevention methods. The prevention of chronic diseases such as coronary heart disease etc., malignant neoplasms, accidents and injuries, infectious diseases.
- The prevention of pollution of food, water, air and soil. Infectious or contagious diseases, such as Hepatitis, Novel Coronavirus, Influenza, Measles and other diseases. Personal hygiene behavior and governmental methodology in the event of an infectious epidemic.
- Allergy and anaphylaxis. Oxidative stress.
- The related terminology and internationally used abbreviations for international organizations, diseases, vaccines, immune sera, etc.
- General population immunization.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working independently
Team work
Working in an interdisciplinary environment
Production of free, creative and inductive thinking

3) SYLLABUS

- Prevention of chronic diseases such as diabetes mellitus, cardiovascular diseases, chronic obstructive pulmonary disease, renal failure, etc.
- Prevention of malignant neoplasms.
- Control of oxidative stress as a biomarker for prevention of degenerative diseases.

- Prenatal screening and genetic screening of population for genetic diseases.
- Prevention of casualties and injuries.
- Allergy and anaphylaxis.
- Prevention of infectious diseases.
- Vaccines and immune serums.
- Public health.
- Nutrition and health.
- Prevention of water, air and soil contamination and its impact on human health.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Use of the Moodle e-learning platform, in order to upload scientific articles, instructions, lectures, useful links, questionnaires, information for attending conferences and seminars related to the course, etc.
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Activity / Semester workload Lectures 150 Total 150
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questions, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Written final exam (100%) may include: - Multiple Choice questions - Short answer questions

5) ATTACHED BIBLIOGRAPHY

A. Greek

1. PrathibhaVarkey. MayoClinic Προληπτική Ιατρική και Δημόσια Υγεία. Gotsis Εκδόσεις, Πάτρα, 2017
2. Αρβανιτίδου-Βαγιωνά Μ. Υγιεινή, 2η έκδοση. University Studio Press, Θεσσαλονίκη, 2009.

3. TortoraJ.G., FunkeR.B., CaseL.Chr. Εισαγωγή στην Μικροβιολογία, 2η ελληνική έκδοση. Γενική Επιμέλεια Α.Τσακρής . BrokenHillPublishersLTD. Εκδόσεις Πασχαλίδης Π.Χ., 2017

B. English

1. Elmore, Wild et al. Jekel's Epidemiology, Biostatistics, Preventive Medicine, and Public Health, Elsevier - Health Sciences Division, 5 th edition, 2020
2. David Rakel, Integrative Medicine, 4th Edition 2017
3. David D. Celentano; Moyses Szklo Gordis Epidemiology, ed.6 Elsevier, 2019
4. Grant S. Fletcher Clinical Epidemiology: The Essentials, ed.6 Kluwer Mark Gladwin, William Trattler, C.Scott Mahan. Clinical Microbiology Made Ridiculously Simple. 6th edition. Medmaster 2014.

C. Scientific journals

Journal of Epidemiology and Community Health,
J of Antimicrob Chemotherapy,
J Glob Antimicrob Resist.,
Recent Pat Antiinfect Drug Discov,
Microb Drug Resist.,
New Microbiol.,
Eur J Clin Microbiol Infect Dis,
J of Clinical Microbiology

Related Scientific Papers.

Arvanitidou M.,Kanellou k.,Katsouyannopoulos V. Occurence and densities of fungi from northern Greek coastal bathing water and their relation with faecal pollution indicators. Water Res 2002, 36: 5127-5131.

8.3. 8th Semester Courses

MECHANISMS AND BIOCHEMICAL MARKERS OF AGING, DISEASE AND CHRONIC DISEASES

COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190803	SEMESTER	8th
COURSE TITLE	**Mechanisms and biochemical markers of aging, disease and chronic diseases**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Theory	2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE general background, special background, specialised general knowledge, skills development	Specialty Course, Compulsory Elective
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://exams phym.the.ihu.gr/course/view.php?id=157, http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- Basic molecular and pathophysiological mechanisms of aging.
- Pathophysiology, diagnosis, prevention and treatment of the most prevalent types of dementia.
- Common diagnostic biomarkers for the diagnosis of dementia e.g. β-amyloid, t-protein, phospho-t protein, synuclein and novel biomarkers.
- The basic mechanisms and pathophysiology of chronic diseases e.g. multiple sclerosis and other autoimmune diseases.

2. Skills

- Methods for biomarker identification and assessment.
- Transfer students' theoretical knowledge into clinical practice and understanding the pathophysiology of major chronic diseases.

3. Competence

- Ability to understand the pathophysiology of dementia syndromes as well as other chronic diseases.
- Ability to search scientific literature in bibliographic literature databases such as PubMed, Scopus
- Ability to generate new research ideas and collaborate with team members.
- Ability of scientific presentation with electronic media

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility

Decision-making	and sensitivity to gender issues
Working independently	Criticism and self-criticism
Team work	Production of free, creative and inductive thinking
Working in an international environment	……
Working in an interdisciplinary environment	Others…
Production of new research ideas	…….
Search for, analysis and synthesis of data and information, with the use of the necessary technology Working independently Team work Working in an interdisciplinary environment Production of free, creative and inductive thinking	

3) SYLLABUS

- Mechanisms and biological markers of aging
- Pathophysiology and molecular mechanisms of dementia. Biomarkers and the effect of nutrition on the development of dementia.
- Vascular dementia
- Alzheimer's disease: Pathophysiology and molecular mechanisms. The value of diagnostic and prognostic biomarkers.
- Multiple Sclerosis: Pathophysiology, diagnostic and prognostic biomarkers.
- Biochemical markers of autoimmune diseases.
- Epigenetics of autoimmune diseases.

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Basic software (windows, word, power point, the web, etc.). Use of the moodle e-learning platform in order to upload scientific articles, instructions, lectures, useful links, questionnaires, information for attending conferences and seminars related to the course, etc.
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Activity / Semester workload Lectures: 150 Total: 150
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questions, short-answer questions, open-ended questions,	Written final exam may include: - Multiple Choice questions - Short answer questions

problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	

5) SUGGGESTED LITERATURE

1. Άνοια, ΤσολάκηΜάγδα, Κάζης Αριστείδης Δ. University Studio Press, 2005.
2. Mark T. Mc Auley et al. Modelling the molecular mechanisms of aging Bioscience Reports (2017) 37, DOI: 10.1042/BSR20160177
3. Sayad Kocahan, Zumrut Doğan. Mechanisms of Alzheimer's Disease Pathogenesis and Prevention: The Brain, Neural Pathology, N-methyl-D-aspartate Receptors, Tau Protein and Other Risk Factors. Clinical Psychopharmacology and Neuroscience 2017;15(1):1-8
4. Huynh RA and Mohan C (2017) Alzheimer's Disease: Biomarkers in the Genome, Blood, and Cerebrospinal Fluid. Front. Neurol. 8:102. doi: 10.3389/fneur.2017.00102
5. Abhijeet Jagtap, Sonal Gawande, Sushil Sharma. Biomarkers in vascular dementia: A recent Update. Biomarkers and Genomic Medicine (2015) 7, 43e56
6. Haijing Wu, et al.Epigenetics as biomarkers in autoimmune diseases. Clinical Immunology 196 (2018) 34–39
7. Nutritional Factors Affecting Mental Health. Lim SY, Kim EJ, Kim A, Lee HJ, Choi HJ, Yang SJ. Clin Nutr Res 2016; 5:143–152
8. The worldwide challenge of the dementias: a role for B vitamins and homocysteine? Smith AD. Food Nutr Bull 2008; 29(Suppl 2):S143–172 Vitamins and the brain: mechanisms, dose and efficacy--a review. Kennedy DO. B, Nutrients 2016; 8:68

8.4 8th Semester Courses

HUMAN MICROBIOME
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190804	SEMESTER	8th
COURSE TITLE	**HUMAN MICROBIOME**		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits	WEEKLY TEACHING HOURS	CREDITS
Theory	2	5
Add rows if necessary. The organisation of teaching and the teaching		

methods used are described in detail at (d).		
COURSE TYPE general background, special background, specialised general knowledge, skills development	Compulsory Elective Course Specialty Course	
PREREQUISITE COURSES:		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK	
IS THE COURSE OFFERED TO ERASMUS STUDENTS		
COURSE WEBSITE (URL)	https://moodle.teithe.gr/enrol/index.php?id=3643, https://moodle.teithe.gr/enrol/index.php?id=3642 http://www.mls.teithe.gr	

2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students are expected to have acquired:

15. 1. Knowledge

- Describe the main microorganisms that make up the human microbiome and the factors that influence its composition
- Describe the methods of determining the microbiome.

2. Skills

• To understand the effect of the microbiome on human metabolism as well as its correlation with healthy functions and pathological conditions.

3. Competence

• To be able to strengthen the acquired knowledge with the current modern laboratory techniques for determining the microbiome in the various biological samples.
• To develop critical thinking and ability to identify and solve problems, working alone or in groups.
• To be able to collect, synthesize, analyze information, ideas, problems and solutions in order to produce new research ideas.

General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility and sensitivity to gender issues
Decision-making	Criticism and self-criticism
Working independently	Production of free, creative and inductive thinking
Team work	……
Working in an international environment	Others…
Working in an interdisciplinary environment	…….
Production of new research ideas	

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management

3) SYLLABUS

THEORY

- Human microbiome
- Composition of the normal intestinal microbiome
- Evolution of the intestinal microbiome with age
- Benefits of the gut microbiome
- Current methods for studying the gut microbiome
- Gut microbiome and nutrition
- Metabolism of intestinal microorganisms
- Effects on gut health and human metabolism
- Immune system - Antimicrobial protection
- Antibiotics
- Prebiotics and probiotics
- Intestinal Dysbiosis
- Intestinal microbiome and pathological conditions

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In the classroom, face to face.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Basic software (windows, word, power point, the web, etc.).
Support of learning process through the electronic platform / e-class</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td><table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>150</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>150</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Theory

1. Written final exam may include:
- Multiple Choice questionnaire
- Short answer questions</td></tr>
</table>

5) ATTACHED BIBLIOGRAPHY

Greek

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2. Χ. Βέρρας, Α. Κ. Παπαζαφειροπούλου, and Α. Μελιδώνης, "Σακχαρώδης διαβήτης και εντερικό μικροβίωμα," Ελληνικά Διαβητολογικά Χρονικά, vol. 27, no.4, pp. 202–209, 2014.
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11. Sridevi Devaraj, Peera Hemarajata, and James Versalovic, "The human gut microbiome and body metabolism: Implications for obesity and diabetes," Clin. Chem., vol. 59, no. 4, pp. 617–628, 2013.
12. Yadav M., Verma MK., Chauhan NS, "A review of metabolic potential of human gut microbiome in human nutrition." Archives of Microbiology, vol. 200, no. 2, pp. 203-217, 2018.

8.5. 8th Semester Courses

FORENSIC SCIENCE: FORENSIC LABORATORY TECHNIQUES
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	285-190805	**SEMESTER**	**8th**
COURSE TITLE	**FORENSIC SCIENCE: FORENSIC LABORATORY TECHNIQUES**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)	2	5

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Elective course	
PREREQUISITE COURSES:	-	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK	
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-	
COURSE WEBSITE (URL)	https://www.mls.teithe.gr	

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:

1. Knowledge

- To describe the principles of forensic science
- To describe the principles of forensic medicine
- To describe terms such as Necropsy, Autopsy, Death
- To apply laboratory methods in the determination of various factors in tissues and biological fluids with application in forensic science and criminology

2. Skills

- Understand the principles of forensic science laboratory (FSL) and the individual stages of the various used biomedical techniques
- To provide information on the correct procedure for the specimen receipt, identification, transport and storage of biological materials in the FSL
- Apply principles of personal protection, personnel protection and the environment from biological, physical and chemical hazards in FSL
- Apply and modify protocols and steps of biomedical techniques for optimal results

3. Competence

- To be able to present using new technologies tasks-experiments to groups of first year students or groups of secondary school students.
- To develop critical thinking and the ability to identify and solve problems, working alone or in groups.
- To be able to collect, synthesize, analyze, information, ideas, problems and solutions in order to generate new research ideas.
- To decide on the best provision of First Aid in the laboratory

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma

Supplement and appear below), at which of the following does the course aim?	
Search for, analysis and synthesis of data and information, with the use of the necessary technology *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*
Search for, analysis and synthesis of data and information, with the use of the necessary technology Adapting to new situations Working independently Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project planning and management Respect for the natural environment	

3) SYLLABUS

THEORY

Forensic science and forensic science laboratory (FSL)

Necropsy, Autopsy, Definition of Death, Forensic biometrics

Types of samples

- Genetic material in the service of forensic science (Forensic DNA)

-Methods for the identification of nucleic acids

Applications of DNA sequencing, mRNA, microRNA, SNPs, STR, miniSTR, X and Y chromosomal markers and mitochondrial DNA.

- Forensic toxicology - direct & indirect toxicant identification
- Chemical/Biochemical methods of forensic laboratory

Applications of extraction methods

Applications of separation methods (chromatography, capillary electrophoresis)

Mass spectrometry applications (MS, LC-MS, GC-MS)

- Applications of histological techniques in forensic science
- Microbiology at the service of forensic science

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In the classroom, face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Basic software (windows, word, power point, the web, etc.). Support of learning process through the electronic platform / e-class
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.*	

Activity	***Semester workload***
Lectures	150

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS		
	Course total	150
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	**Theory** 1. Written final exam (100%) may include: - Multiple Choice questionnaire - Short answer questions	

5) ATTACHED BIBLIOGRAPHY

A. Greek

13. Ψαρούλης Δ. ΙΑΤΡΟΔΙΚΑΣΤΙΚΗ. ΑΠΟ ΤΗ ΘΕΩΡΙΑ ΣΤΗΝ ΠΡΑΞΗ. Γ΄ έκδοση. UNIVERSITY STUDIO PRESS, 2018.
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B. English

1. Forensic Biology, Max Houck, 1st Edition, Academic Press, Elsevier, 2015, eBook ISBN: 9780128007112, Hardcover ISBN: 9780128006474
2. Forensic Chemistry, Max Houck, 1st Edition, Academic Press, Elsevier, 2015,ISBN: 9780128006245
3. Forensic Microbiology, David O. Carter, Edited by Jeffery Keith Tomberlin , Edited by M. Eric Benbow , Edited by Jessica L. Metcalf. John Wiley & Sons Inc. 2017, ISBN10 1119062551
4. Forensic Histopathology. Fundamentals and Perspectives, Dettmeyer, Reinhard, Springer, 2018, ISBN 978-3-319-77997-3
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6. Forensic DNA Biology, Kelly M. Elkins, Academic Press, Elsevier, 2013, ISBN 978-0-12-394585-3
7. Weight of Evidence for Forensic DNA Profiles [electronic resource], Balding, HEAL-Link Wiley ebooks, 2nd Ed. 2015

8.7. 8th Semester Courses

Practical Exercise (Intership) II / Clinical-Laboratory Training
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE		**SEMESTER**	**8th**
COURSE TITLE	**Practical Exercise II / Clinical-Laboratory Training**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Practical Exercise II/ Clinical-Laboratory Training (5 months = 600 hours)	30	20
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Course
PREREQUISITE COURSES:	YES 4. The 2/3 of the total courses of semesters 1st-7th 5. All the rest of specialty courses 6. The laboratory section of all courses.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://www.mls.teithe.gr

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students are expected to have acquired:
The purpose of the students' internship is to train them within the field of knowledge of the department they are attending.
The compulsory Practical Training II/Clinical-Laboratory Training includes the training in departments of hospitals or diagnostic centers, clinics and generally in places of their discipline in Greece or abroad. Part of the Internship/Clinical-Laboratory Training may also be carried out in research laboratories of a similar discipline.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
	Respect for the natural environment

Decision-making *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *……*

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

3) SYLLABUS

During the compulsory Practical Exercise II/Clinical-Laboratory Training in departments of hospitals or diagnostic centers, students should be trained in different fields and become familiar with basic technical tests performed in each field. These areas may be biochemical, hematological, microbiological, histopathology, cytology, molecular diagnostics, serological-immunological, blood donation. In addition, during their practical training, students must carry out a sufficient number of blood collections.

The compulsory traineeship corresponds to 5 months of five-day work (600 hours) and is carried out in either public or private sector. The number of hours of practical training per day is set at 6 in order to allow students to take elective courses during the 13 weeks of the semester. Compulsory practical/clinical laboratory training takes place during the last semester of studies (8th semester) and only if the student has successfully completed 2/3 of the courses of the curriculum and corresponds to 20 ECTS. He/she must also have a satisfactory attendance of the laboratory section in all courses that have a laboratory section

4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face training.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	During the internship students are supervised by the internship supervisor, who is appointed by the Department for this purpose. The members of the training staff who will be assigned to supervise student interns visit the internship sites, are informed about the assignment, monitor their performance and cooperate in problem solving, both with the trainees themselves as well as with the hospital staff member responsible. Train in using all relevant technologies in the internship/laboratory training areas.
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational*	

Activity	*Semester workload*
Clinical / Laboratory training	600

visits, project, essay writing, artistic creativity, etc. *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*		
	Course total	600
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Each trainee keeps a trainee book in which he/she notes each week the tasks he/she has been engaged in, as well as a brief description of the tasks assigned to him/her in the workplace. Each weekly entry shall be checked and signed by the hospital or internship site supervisor responsible for monitoring the trainees. The trainee's competency is evaluated by the internship site supervisor and the academic supervisor. The overall course grade shall be a 5 out of the total course grade (10), of internship competency, as certified by the Internship Lab Supervisor and the academic supervisor. For the balance of their grade, trainees are examined by a 3-member committee, on questions on practical issues related to day-to-day procedures in the internship laboratory area.	

5) ATTACHED BIBLIOGRAPHY

8.7. 8th Semester Courses

Diploma Thesis (Bachelor's degree)
COURSE OUTLINE

1) GENERAL

SCHOOL	HEALTH SCIENCE		
ACADEMIC UNIT	BIOMEDICAL SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE		**SEMESTER**	**7th & 8th**
COURSE TITLE	**Diploma Thesis (Bachelor's degree)**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures (Theory)			5

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialty Course, Compulsory Elective Course
PREREQUISITE COURSES:	YES The diploma/thesis is a one single course of 10 credits divided into two semesters of 5 credits each. The student must register the thesis in two consecutive semesters. Students are required to complete and take the final examination after the completion of the two semesters. Students who have completed the first six semesters of study and have successfully passed 2/3 of the courses in those semesters, may apply for the first declaration of the diploma/thesis.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://moodle.teithe.gr/course/view.php?id=2164, http://www.mls.teithe.gr/?page_id=8078

2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The thesis can be either literature-based or research-based.

The aim is to enable the student to be trained to:
Search for appropriate literature to cover a scientific topic.
To assess the validity of information and select valid sources upon which to rely.
To search for the most up-to-date publications on the subject.
To critically read the various sources and synthesize the information gathered.
To compose a review paper by citing information in a correct order and logical sequence.
Critically comment on different sets of conflicting information and formulate conclusions.
Make correct reference to bibliographical sources.

In order to do a research thesis, the student must learn to:
To write a research paper following the correct order: Theoretical part (Preface, Purpose, Bibliographical review-Scientific questions asked) Experimental part (Objective-Research & study design, Materials and Methods, Description and discussion of experimental results, Conclusions).
In collaboration with the supervisor:
Participate in the design of the experiments.
Perform experimental protocols carefully and consistently.
To predict and recognize various arising errors in the experimental processes.

Analyse and evaluate results
Discuss and compare experimental results with those in the literature
Make conclusions or suggest ways of investigating scientific conclusions

In addition, students should be trained to:
Prepare a power point presentation with: the main points of their work with emphasis on the most important ones, presented in the correct order, clearly and within the limits of time given.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for the natural environment

3) SYLLABUS

The diploma thesis must:

Address a topic relevant to their field of study.

Cover the subject adequately in a range of approximately 50 - 100 pages depending on the number of students collaborating on the thesis

It must have decent presence and a high level of quality and contain the most up-to-date bibliographic data.

- It should not include knowledge derived from a single source but should critically combine several literature sources.

- It should not contain a verbatim transcription of text by other authors. If this is deemed necessary and with the agreement of the supervisor, it should be placed in parentheses with the author's name and the corresponding reference.

The bibliographic data should include, inter alia, references to recent publications by other scientists, the most up-to-date relevant World Health Organization (WHO) reports, or the most recent guidelines of relevant Scientific Societies.

- The diploma thesis must critically combine literature data, such as searching for, reporting and annotating differences between studies that may be cited and present conflicting views.

- It must not be a copy of another author's work, in full or in part. Plagiarism is an act of misconduct sanctioned by law.

4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face to face.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Access to the internet for appropriate bibliography.
Internet usage for database exploitation
Use of online and non-computer programs to produce and process data.
Preparation of a PowerPoint presentation of the work</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Face-to-face communication with the student facilitated by online communication. Internet use for literature research.</td><td>150</td></tr>
<tr><td>Use of the required software for writing and presenting papers.</td><td></td></tr>
<tr><td>Use of electronic communication for continuous teacher-student contact.</td><td></td></tr>
<tr><td>Face-to-face communication with the student facilitated by online communication. Internet use for literature research.</td><td></td></tr>
<tr><td>Use of the required software for writing and presenting papers.</td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>150</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>The Thesis is considered completed and examined after the completion of two semesters.

A three-member examination committee is appointed for the examination and evaluation of bachelor's theses:
The committee shall:
A) Consider the thesis
(B) attend the presentation
C) ask questions and lastly
D) give a grade to the thesis
The grading of the thesis is based on the following criteria:
(a) Excellence, correct use of scientific terminology and quality of the text.
(b) use and integration of current literature
(c) contribution to the development of new knowledge or updating of new scientific knowledge.
(d) excellence of presentation
(e) appropriate response to committee's questions
If the thesis or the student's related knowledge and understanding of the topic is judged to be inadequate or receives a very low grade, the student may be given up to one month to make corrections and to better prepare and repeat the presentation for re-examination.
Otherwise, a re-examination may take place in the next session of presentations.</td></tr>
</table>

5) ATTACHED BIBLIOGRAPHY