Doc. 300.1.2

Date: 05/05/2021

Higher Education Institution's Response

- **Higher Education Institution:**
  European University Cyprus
- **Town: Nicosia**
- **Programme of study**
  Name (Duration, ECTS, Cycle)

  In Greek:
  "Μηχανική Υπολογιστών (4 έτη, 240 ECTS, Πτυχίο)"

  In English:
  "Computer Engineering (4 years, 240 ECTS, B.Sc.)"
- **Language(s) of instruction:** English
- **Programme's status:** Currently Operating
- **Concentrations (if any):**

  In Greek: Concentrations
  In English: Concentrations

The present document has been prepared within the framework of the authority and competencies of the Cyprus Agency of Quality Assurance and Accreditation in Higher Education, according to the provisions of the "Quality Assurance and Accreditation of Higher Education and the Establishment and Operation of an Agency on Related Matters Laws of 2015 to 2019" [N. 136 (I)/2015 to N. 35(I)/2019].

A. Guidelines on content and structure of the report

- *The Higher Education Institution (HEI) based on the External Evaluation Committee's (EEC's) evaluation report (Doc.300.1.1 or 300.1.1/2 or 300.1.1/3 or 300.1.1/4) must justify whether actions have been taken in improving the quality of the programme of study in each assessment area.*

- *In particular, under each assessment area, the HEI must respond on, without changing the format of the report:*

- *the findings, strengths, areas of improvement and recommendations of the EEC*
- *the conclusions and final remarks noted by the EEC*

- *The HEI's response must follow below the EEC's comments, which must be copied from the external evaluation report (Doc.300.1.1 or 300.1.1/2 or 300.1.1/3 or 300.1.1/4).*

- *In case of annexes, those should be attached and sent on a separate document.*

The Department of Computer Science and Engineering of European University Cyprus wishes to express its sincere gratitude to the External Evaluation Committee (EEC) for the evaluation of the undergraduate programme of study Computer Engineering (B.Sc.).

It is with great pleasure that the Department and the School of Sciences noted the positive feedback of the EEC and we appreciate its insightful recommendations, which provided us the opportunity to further improve the quality and implementation of the programme. In the following pages, we respond in detail to all recommendations for improvement suggested by the EEC and we provide all relevant information to explain the actions taken to ensure that the newly accredited programme is of high quality.

1. Study programme and study programme's design and development
(ESG 1.1, 1.2, 1.7, 1.8, 1.9)

Areas of improvement and recommendations
The following areas of improvement and recommendations have been identified:

1. Collect and communicate in a systematic manner relevant statistics (e.g., number of applicants, student acceptance rate, examination pass rates, etc.) to all related faculty and staff in order to facilitate ongoing monitoring and improvement of the CE program.
2. Run the established process for quality assurance on an annual basis for timely identification of issues and continuous program improvement.
3. Monitor and identify the causes of the relatively high drop-out rate and follow up with support for students who transfer to other programs. This may be particularly critical and important for a program like CE that has a relatively small number of registered students.
4. Enhance the quality assurance policy and practice by engaging and receiving feedback from international experts in the related fields (e.g., the current curriculum does not have any course on artificial intelligence and machine learning, which are very important topic in computer engineering and should be included in the program). This will assure a better international alignment and can regularly source the program with internationally hot topics, which will contribute to the attractiveness of the program.

Response by EUC:

1) **Collect and communicate in a systematic manner relevant statistics**

Every year the Computer Engineering program executes its Quality Assurance assessment following the structure set out by the Program Evaluation Review (PER) process. During this assessment, all information regarding relevant statistics pointed out by the EEC are collected from the Department of Enrolment of the University. Statistics are then discussed by the Program Academic Committee for the respective PER processes with all involved bodies (please find attached the EUC Internal Regulation of the PER procedure in Appendix 1). The Program Academic Committee involved in the PER process is composed of the Computer Engineering Program Coordinator, all Full-Time Faculty involved in the program, representatives of the administration personnel (e.g. Department of Enrolment, Department of Admissions, etc.), and a student representative. This process establishes transparency among relevant faculty, stuff and students, and promotes a detailed discussion to resolve any issues or discuss future improvements.

The PER process is an integral part of the University's overall Quality Assurance process. PER encourages excellence in academic programs by aligning teaching and learning, curriculum, and other academic processes and activities with the mission of individual programs. The process is an essential part of EUC's continued effort to ensure that its mission is met through the delivery of its programs, that EUC programs of study comply, at institutional level, with Standards and Guidelines in the European Higher Education Area, and that EUC programs' structure, content and delivery mode meet stakeholders' expectations and needs.

Additionally, students' academic progress is monitored based on their GPA (Grade Point Average) on a semester basis. Taking into consideration the ECTS load of each student and their semester GPA, Student Advisors at the Advising Centre of the Department of Enrolment come into communication with students to address issues and assist those with low GPA, by

monitoring their academic path and discussing ways to improve performance. The same list of students with low GPA's reaches the Schools' program coordinators, Chairpersons, and Dean for their perusal. The Department closely monitors and supports students with low GPA by following these procedures for supporting students with low GPA as these are described in the EUC Internal Regulation on Low GPA (more information about the processes involved appear in the discussion of topic item 3 below; please also see for more details of the procedure in the Internal Regulation on "EUC's Procedures For Supporting Students With Low Grade Point Average (GPA)" that appears in Appendix 2). These actions are additional to the efforts/support that each individual instructor of the Department provides to each student and aim for a timely and early enough diagnosis of the phenomenon in order to facilitate an effective, early intervention. Moreover, high achievers are rewarded annually with Academic Excellence Scholarships and Certificates of Excellence (Deans' List).

2) **Run the established PER process for quality assurance on an annual basis**
The Program Evaluation Review (PER) framework constitutes EUC's official University-wide Quality Assurance policy which ensures that EUC programs of study comply, on institutional level, with Standards and Guidelines in the European Higher Education Area, and that EUC programs' structure, content and delivery mode meet stakeholders' expectations and needs. The PER framework (as it has been presented during the visit and it is also provided as an attachment to this report) is continuous in nature, which means that the Computer Engineering Program Committee continuously receives and assesses a wealth of information from all available sources described in Section 3 of the attached PER framework description. Therefore, in practice, the process is initiated more frequently than once per year, as some of the important PER information is received on a semester basis. At this particular moment in time, the Computer Engineering Program Committee is expecting the outcome and the recommendations of the Computer Engineering Program's Accreditation Process from CY.Q.A.A. in order to immediately initiate the Program's PER process, as this information constitutes a critical input to its implementation.

3) **Monitor and identify the causes of the relatively high drop-out rate and support students:**
During the initial years of studies at a university, a student's poor performance can lead to her/his drop-out, as this is well-known from international statistics, especially in STEM-related programs of study. For instance, based on a recent article[1], the American Society for Engineering Education (ASEE) found that 40% to 50% of engineering students drop out or change their majors.

Table 1 shows the total enrolment, the new enrolment at the beginning of the academic year, and the drop-out rate and percentage. Thus, even though the drop-out rate of the program might appear in the first instance as relatively high, when compared with other local and international statistics for STEM degrees this is within the average/normal range.

[1] "What Prevents Many EE Students from "Making It" to Professional Careers?", April 08, 2020, Tyler Charboneau available at: https://www.allaboutcircuits.com/news/what-prevents-many-ee-students-from-making-it-to-professional-careers/#:~:text=The American Society for Engineering, out or change their majors

Table 1

Drop out Percentage for Computer Engineering program

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Total Enrolment	55	43	41	40	30	24
New Enrolment	5	7	11	12	8	8
Drop-out	8	6	8	10	9	-
Drop-out/%	**15%**	**14%**	**20%**	**25%**	**30%**	

We would like to thank the EEC committee for pointing this out and we welcome any suggestions that the committee may have to remedy this phenomenon. European University Cyprus has taken several steps to decrease the drop-out rate. The University implements a '**Low GPA Policy**' (more information has been provided in the discussion of topic item 1 above; please also see for more details of the procedure in the Internal Regulation on "EUC's Procedures For Supporting Students With Low Grade Point Average (GPA)" as appears in Appendix **2**) to support the students and reduce this phenomenon and its effects. This policy outlines a framework providing the process and actions to be taken. Information for low GPA students is provided by the Department of Enrolment (per Department and per program of study) twice per year in the beginning of each semester. The policy ensures: 1) the provision of correct information to all students, namely undergraduate, postgraduate, Conventional and Distance Learning students; 2) that students are aware of the role of GPA and the impact of low GPA on the progress of their studies; 3) increased support provided at the Program, Department and School level; 4) proper implementation of procedures by the Student Advising Centre.

When the process is initiated the following steps are followed for all students:

a. The Department of Enrolment provides the Schools at the beginning of each academic semester with a list of their students with a low GPA (for undergraduate courses 2.0). This includes first year students and students included in the list for the first time.
b. The Program Coordinator communicates with each affected student, in order to ensure that students are aware of the concern of the Department and School, and that students are indeed properly informed that the Department is available to provide support (e.g. students are informed about the role and importance of the GPA, the possible reasons and causes of the low GPA, and ways for improvement of the situation, which may either involve the student (e.g. further effort) or the Department and School).
c. All student cases are also presented to the Chairperson of the Department, for further discussion and enhancement of the process, aiming at the most tangible academic targets and the procedures involved.

For this academic year we have already initiated this process in February-early March and it will be repeated after the announcement of the Spring 2021 grades in June.

Further actions are taken by each individual instructor/advisor, aiming for a timely and early enough diagnosis of the phenomenon of drop-outs and facilitating an effective, early intervention. For example, a policy followed by Faculty is the reporting of absences of students to their Student Advisors. Students' absences for three continuous class meetings are reported by Faculty to Student Advisors who investigate and take further action. This close communication of students with Student Advisors promotes early identification of problematic

cases and prevents students from leaving the program. Other examples include continuous polling of students by both Faculty and Student Advisors to assist them in their courses, or in any other issues branching from their academic or personal life. These are some supporting activities of Faculty and Student Advisors aiming to keep students involved, interested, and happy. We are open to further suggestions by the EEC.

4) **Engaging International experts in the related fields and introducing artificial intelligence and machine learning**

A key component of the PER evaluation procedure involves seeking feedback from the Industrial Advisory Board (IAB). We understand the concern of the EEC committee with regards to enhancing the quality assurance policy and the need to engage international experts in the related fields. Thus, after the suggestion of the EEC the **Departmental Council, during its meeting on March 19, 2021, have agreed to a modification of the IAB composition so that at least one member of the IAB is an international expert in the field**. This will assure better international alignment and the inclusion of state-of-the-art computer engineering topics that will make the program more attractive.

As a first step, we have communicated with Prof. Mohsen Guizani who accepted to be part of the IAB committee (see his short bio here[2]) The next IAB meeting will be at the beginning of 2022, a semester after the program is initiated. This will give us the opportunity to assess the implementation of the re-accredited program, while also having some student feedback from its operation in the first semester.

We thank the EEC for its recommendation to include Artificial Intelligence and Machine learning as new topics. We believe that these topics would be of great interest to students. Even though these topics are not listed as part of the recommended topics for Computer Engineering in the 2016 IEEE and ACM guidelines, **we introduced the course CSE330 Artificial Intelligence as a Major Elective course** (please see the Syllabus of the course in Appendix 3; please see also the revised Structure of the program in Appendix 4)

In addition, **we have incorporated the topic Introduction to Machine Learning under the umbrella of the Major Elective ECE450 Contemporary Topics**. The objective of this Contemporary Topics course is to provide students with the opportunity to gain knowledge in cutting-edge Computer Engineering topics, which are not included in the current curriculum of

[2] **Mohsen Guizani** received the B.S. (with distinction) and M.S. degrees in electrical engineering, the M.S. and Ph.D. degrees in computer engineering from Syracuse University, Syracuse, NY, USA, in 1984, 1986, 1987, and 1990, respectively. He is currently a Professor at the Computer Science and Engineering Department in Qatar University, Qatar. Previously, he served in different academic and administrative positions at the University of Idaho, Western Michigan University, University of West Florida, University of Missouri-Kansas City, University of Colorado-Boulder, and Syracuse University. His research interests include wireless communications and mobile computing, computer networks, mobile cloud computing, security, and smart grid. He is currently the Editor-in-Chief of the IEEE Network Magazine, serves on the editorial boards of several international technical journals and the Founder and Editor-in-Chief of Wireless Communications and Mobile Computing journal (Wiley). He is the author of nine books and more than 500 publications in refereed journals and conferences. He guest edited a number of special issues in IEEE journals and magazines. He also served as a member, Chair, and General Chair of a number of international conferences. Throughout his career, he received three teaching awards and four research awards. He also received the 2017 IEEE Communications Society WTC Recognition Award as well as the 2018 Ad Hoc Technical Committee Recognition Award for his contribution to outstanding research in wireless communications and Ad-Hoc Sensor networks. He was the Chair of the IEEE Communications Society Wireless Technical Committee and the Chair of the TAOS Technical Committee. He served as the IEEE Computer Society Distinguished Speaker and is currently the IEEE ComSoc Distinguished Lecturer. He is a Fellow of IEEE and a Senior Member of ACM.

the Computer Engineering Program. Thus, by providing the aforementioned topics we bring the total of major electives to 9 instead of 8 - of which students will have to choose 4 (please see the revised Structure of the Program in Appendix 4).

2. Student – centred learning, teaching and assessment

(ESG 1.3)

Areas of improvement and recommendations

1. Enrich teaching methodology beyond mainly relying on face-to-face lecturing. The EEC proposes that learning methodologies such as group projects, assignments and experimental work by groups of students will be further investigated, specified, and implemented.
2. Invite and develop additional relationship and participation on the internship program from industries and public sectors (like for examples schools).
3. It may be advantageous to provide student survey results directly to faculty members for the purpose of improvement of the program.

Response by EUC:

We would like to thank the EEC for their valuable suggestions relating to students' learning, teaching and assessment and for the opportunity to provide more details on the Department's policies and actions regarding the above recommendations.

1. **Enrich teaching methodology to include group related activities**

The Computer Engineering program follows the latest ACM/IEEE Guidelines for Computer Engineering Programs of study. It aims to develop practical skills through extensive project and laboratory work, covering computing, electronics, and embedded systems, as well as a firm foundation in the principles and theory of Computer Engineering. The program adopts the concept of embedded laboratories and places emphasis on hands-on practical experimentation. **Taking into account the recommendations of the EEC, we have introduced modifications to the teaching methodology in the program courses to specifically give emphasis to group related activities, such as group lab activities, mini group project, etc**. Indeed, group activities for theoretical or mathematically-oriented courses can investigate solutions, execute surveys, or work on problem. Similarly, group activities for lab-based courses could include group work for the investigation, design, and development of systems, for practical proof of concept of various design aspects, or for experimentation.

In doing so, the following text has been added in the Teaching Methodology section of the Syllabi of the Computer Engineering Courses:

> *Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.*

This change has been applied to all the Computer Engineering program courses, except for cases where it involved Individual Project work, such as in the courses ECE 400 Computer Engineering Design, ECE495 Senior Design Project, and ECE418 Internship Project. More specifically, the syllabi of a total of 15 out of 18 computer engineering courses were modified.

Below is the list of Computer Engineering courses with this addition:

Computer Engineering Compulsory Courses

Code	Title	ECTS
ECE105	Problem-Solving Fundamentals & Measurements	6
ECE200	Digital Systems I	6
ECE205	Circuits & Electronics I	6
ECE210	Computer Organization & Architecture	6
ECE220	Circuits & Electronics II & Laboratory	12
ECE230	Signals & Systems Theory	6
ECE300	Digital Systems II & Laboratory	12
ECE305	Advanced Computer Organization and Architecture	6
ECE310	Embedded Systems & Laboratory	12
ECE405	Wireless & Mobile Networks	6

Computer Engineering Major Electives

Code	Title	ECTS
ECE361	Network Fundamentals	6
ECE362	Routing & Switching	6
ECE425	Digital Signal Processing	6
ECE430	Parallel & Distributed Computing	6
ECE450	Contemporary Topics	6

All academic staff teaching the above courses (to be decided before the current academic year) will be trained before the beginning of Fall Semester 2021 with regards to the implementation of group projects as part of the teaching methodology. Each faculty will then decide on a specific approach for a group project (i.e., group lab, survey, etc.) based on the nature of the course.

The University through its **Faculty Development Program** (offered by the C.I.Q.A. Faculty Development Standing Committee) organizes and delivers various seminars on a semester basis on issues pertaining to teaching and learning, and research in higher education, which emerge through feedback and needs identified by academic staff, as well as in the context of current needs and developments, such as those brought by the pandemic (see Faculty Development Program for F2020-S2021 and the Preliminary Program for F2021 in Appendix 5).

In addition, following a recent decision by the University's Quality Assurance Committee and the University Rectorate (17.2.2021) in an effort to better address more program- and discipline specific needs in the various scientific fields, Schools and Departments are to organize and offer on a semester basis in-house professional development seminars catered to their needs so as to support the creation of a learning and research community within their Departments and Schools through the exchange of best practices, as well as recent scientific developments in their respective fields.

All revised syllabi of the courses above appear in Appendix 3.

2. **Invite and develop additional relationship and participation on the internship program**

European University Cyprus and the Department of Computer Science and Engineering places emphasis on student involvement in Internships, in order to provide real-world experience to students, shape their professional character, and open doors to future opportunities of employment. Our students can get involved in internships through various mechanisms. One such mechanism is the Computer Engineering course ECE418 Internship Project. More specifically, the following procedures are carried out during the implementation of ECE418 courses:

1. Interested companies submit an internship project proposal

2. Any internship project submitted is reviewed by the instructor responsible for the implementation of the course and discussed with the company's project "mentor". Each project has two "mentors": the internal one (the course instructor), and the external one (a company's employee). They are jointly responsible for the administration of the project. Once a project is accepted and finalized, the Department of Computer Science & Engineering makes it available online.

3. Students express interest in implementing an internship project by sending an e-mail application, with their CV attached to the course instructor. The instructor evaluates the applications and decides on the allocation, based on criteria, such as the student GPA, student's performance on relevant courses, etc.

4. Once a project is allocated to a student, a contract is prepared and signed by all interested parties (the student, the course instructor, and a company's representative).

5. The student enrols to the course and initiate her / his project work within the industrial environment.

6. Within one month from the completion of the internship project, the student submits a short report to the internal 'mentor', and the timesheets of his work in the company signed by the external project mentor. The company's mentor also submits a short report regarding the internship project. The internal mentor then assign a grade to the student based on both project reports.

More information regarding this process is given in the Appendix 6.

In addition, other opportunities to students are provided via IAESTE, which is an organization that offers internships to students at a global level. The Department has close collaboration with the IAESTE officer in Cyprus which presents opportunities to students as they become available, and assists them in the application process. Furthermore, internships are available to students through faculty projects under the umbrella of our research centers.

Please also note that employability of our graduates has increased over recent years and our students are regularly employed before graduating. Even though this fact may sometimes act as a demotivating factor for students to get involved in internships, we will continue our efforts to develop and expand this front by building new and stronger bonds with industry and state universities.

3. **Provide student survey results directly to faculty members**

We want to thank the EEC for the opportunity to provide more information regarding this issue. As discussed during the accreditation day, this mechanism **is already in place**. More specifically, student surveys are executed in the following manner. Towards the end of each semester the students are asked to evaluate each of their courses online. Submission is anonymous and the time it takes to fill out the evaluation form is around 10-15 minutes. The survey pertains all aspects of the course and the overall learning experience of the student (hence named the Survey on 'Student Feedback on their Learning Experience' -SFLE), such as the course structure and content, the faculty performance, the facilities involved, the administrative support, etc. (please see the Fall 2020 version of the Survey in Appendix 7). The information received are aggregated in a different way based on the type of question. Questions that have a specific scale of grading (e.g., from 0-5) are averaged. All answers to questions that require text input are simply appended as one large paragraph. These results are then forwarded to faculty to review and act accordingly. The Chairperson of the Department also reviews the aggregated information per course and makes recommendations where needed.

A detailed description of the procedures involved is provided below:

Survey on 'Student Feedback on their Learning Experience'.

Evaluation of learning and teaching processes and practices is essential to enable the European University Cyprus to continuously improve student learning outcomes and learning experience. The University has developed a questionnaire titled *Student Feedback on their Learning Experience (SFLE)* as a source of information for receiving feedback by students on their overall learning experiences, per course and per academic semester. The *SFLE* takes place during the two last weeks prior the final examination period according to the semester's schedule.

The Scope of SFLE: The *SFLE* procedure applies to all EUC students attending undergraduate and master programmes of study (both conventional and distance learning). The procedure provides the basis for the collection and analysis of the *SFLE* data and the reporting of these results to Faculty members themselves, the respective Chairpersons and Deans, and the Rectorate Office, to enable improvement and amendment of teaching practices.

The Strategic View of SFLE: The *SFLE* process is part of the University's Strategic Plan and is designed to offer students' perspective on the way courses are being taught as an essential

element of internal quality assurance processes. As with most universities worldwide, at EUC students are considered key stakeholders.

The *SFLE* provides valid, reliable information/data on the impact and resource effectiveness of learning and teaching, as well as on instructor-related issues, thus contributing to the continuous improvement of academic programmes. The survey questions assess not only the course and the instructor, but also the unique features of particular forms of learning and teaching (such as digital enhanced learning, clinical/practical/laboratory teaching methodologies, the use of technology), as well the interaction and communication with all support services provided by the University and the overall EUC culture and structures for supporting students' learning experience.

The findings from the analysis of the questionnaire survey are utilized in various ways, including:

a. the Programme Evaluation Review (PER) process of programmes of study, which aims at programmes' ongoing monitoring and evaluation (*for further information please see APPENDIX 1; Internal Regulation on EUC's Programme Evaluation Review*). The *SFLE* findings complement other data sources gathered during the PER process, such as programme and Department relevant documents and Minutes, reflective documents, expert/peer reviews, student assessment results, teaching portfolios, etc. which all provide valuable information in reviewing EUC programmes of study.

b. In addition to the use of the *SFLE* findings in the process of changes and development of EUC programmes of study, the *SFLE* provides a key component in academic staff's professional development leading to enhanced quality of learning and teaching at EUC. More specifically the findings from the individual reports are discussed between the instructors, the Chairperson of the Department and if needed with the Dean of the School in a constructive peer review manner, thus feedback, support and guidance are provided to the involved instructors. It must be noted here that the contract renewal of part-time academic staff each semester takes into serious consideration students' feedback by the *SFLE.* In this way, there is a continuous improvement of teaching quality in the Department.

c. Moreover, *SFLE* findings are used to guide faculty support through the EUC Faculty Professional Development programme. More specifically selected findings from the *SFLE* findings are taken into consideration when new seminars and training sessions are scheduled by the Office of the Vice-Rector of Academic Affairs, as well during the panning of in-School/Department academic staff professional development activities.

The Management of Information/Data of SFLE: The design, conduct and reporting of *SFLE* respect the rights, privacy and confidentiality of all parties involved. Student responses are anonymous.

The Monitoring of SFLE: The *SFLE* process is monitored by the Office of Vice-Rector of Academic Affairs, which informs the Rectorate Committee, as well as the University's Internal Quality Committee, to ensure it enhances the quality of learning experience and culture at the University.

Responsibilities of stakeholders involved in the implementation of SFLE:

a. The Office of the Vice-Rector of Academic Affairs is responsible for the management of *SFLE*.

b. The Dean of each School and the Chairpersons of each School's Departments communicate the outcomes of the *SFLE* to all instructors and discuss with them critical issues concerning overall findings.

c. Each programme coordinator incorporates and presents the *SFLE* results in each programme's PER report.

d. All instructors are responsible for engaging students in filling in the *SFLE*. Additionally, full-time faculty members include the *SFLE* findings in their promotion applications, as well as in their bi-annual self-performance evaluation, as per University Charter guidelines.

e. Students are responsible for providing their feedback on their learning experience for each course they attend by participating in the *SFLE* process.

In Appendix 8, we present the survey's questions and the average scores of the previous *SFLE* (Fall 2020) for all modules of the 'Computer Engineering' program under evaluation.

3. Teaching staff

(ESG 1.5)

Areas of improvement and recommendations

Perhaps related information has not been provided to the EEC, there seems to be a need to:
1. Establish strategic areas of expertise for further recruitment of faculty members, and
2. Define and promote clear career development for faculty members (e.g., tenure and promotion processes and criteria).

Response by EUC:

1. **Establish strategic areas of expertise for further recruitment of faculty members**
We welcome the feedback of the EEC for further improvements in the strategic development of the Computer Engineering program. One of the **immediate priorities** of the School of Sciences Academic Plan Strategy is to proceed upon increase of its student intake with targeted faculty additions so as to deepen academic expertise and to allow sustainable growth, to support current and future programs, and strengthen its research capacity and output (see Appendix 9 for the School's Strategic Areas of Development for years 2020-25)

As mentioned in our presentation, the computer engineering market worldwide is set to increase extensively in the future (exceed 2.5 trillion dollars based on MarketWatch Feb 10, 2021). This is due to a number of factors, namely: 1) the rapid growth of Consumer Electronics due to the economic development of developing countries, such as India and China; rapid industrialization and urbanization has led to this economic improvement. 2) the massive penetration of Cloud Computing in industry, 3) the exponential increase in IoT applications due to the needs of various sectors, such as the automotive industry, the military, the medical sector etc. **Taking the aforementioned factors in mind, we have established strategic areas of expertise for the computer engineering program**. As pointed out earlier, we have re-designed our Computer Engineering program based on the latest ACM/EEE guidelines and placed emphasis on embedded hardware programming, security, artificial intelligence, and robotics. Thus, we have proceeded to hire new faculty supporting these new directions. More specifically, the following faculty were recently hired:

	Name	Field	Hiring Date
1	Dr. Yianna Danidou	Cybersecurity	February 2019
2	Dr. George Hadjichristofi	Computer Engineering and Network Security	September 2019
3	Dr. Pericles Cheng	Robotics	September 2020
4	Dr. Alberto Calzada	Artificial Intelligence/Machine Learning Engineering	September 2020

We place utmost attention to the strategic development of our program. Through the PER process we plan to continuously evaluate our program, with feedback from various parties, such as industry, professional bodies, faculty, and students.

2. Define and promote clear career development for faculty members

European University Cyprus has defined clear promotion criteria and procedures as shown in Appendix 10. Promotion is taking place on the basis of competency, qualifications, experience and other relevant factors. A major requirement for promotion from one rank to another is excellence in teaching, research and service to the Community, and sustained commitment and dedication to the University. Advancement in rank is not merely a matter of routine or seniority, but it is based primarily on merit.

In addition, there are several University policies and practices in place to aid faculty's career advancement.

The University has a research policy which sets the code of conduct for researchers and lays out the facilities and processes available to faculty so as to promote research. One example, within the research policy is the Teaching Hour Reduction policy, which allows faculty to have a reduced teaching load when acting as research project coordinators (See Appendix 11 for more cases when the THR applies).

The THR policy has led into a boost of not only the quantity, but also the quality of research output. Specifically, in the last five years, the University's output in Scopus indexed paper journals has quintupled as much. That is, for the years 2018, 2019 και 2020, the University's publications in Scopus indexed journals is of the order of 156, 192 and 312, respectively. On the basis of this track record, and provided that the University maintains the benchmark of 150 high quality journal articles in the years 2021 και 2022, it fulfils the criteria for the Times Higher Education World rankings in 2023.

Apart from the cumulative nature of the THR policy, this high research culture is supported through the recently introduced Sabbatical leave scheme (Appendix 12). The Sabbatical leave scheme aims at encouraging faculty members to engage in scholarly research and international networking, and it is granted with full remuneration. Sabbatical leave is granted for planned travel study, formal education, research, writing of papers, monographs and books or other experience of academic value. At the end of the Sabbatical period, the faculty member must submit a detailed report on the research activities performed under that period.

In addition, the "Annual Awards for Excellence in Research" may be seen as a further motivation for faculty to engage in high quality research. Specifically, two faculty members are awarded these Awards, on the basis of the quality and impact of their research. These two awards are:

- The "EUC Research Award-Young Researcher", is awarded to young researchers that have demonstrated the ability to perform high-quality research. The Award aims to enhance young scientists' research activity who have shown an ability to produce significant and internationally recognized achievements from the early stages of their career.

- The "EUC Research Award-Distinguished Researcher" is granted to excellent scientists with extensive research experience who have demonstrated significant and internationally recognized research results. The Award aims to appraise and promote

the work and personality of these distinguished scientists who honour European University Cyprus through their high-quality research and its impact.

A series of other incentives is also employed, so as to encourage and support full-time faculty in their research activities, as outlined below:

- Based on their research profile and activities (at the time of hiring), newly hired full-time faculty members may be granted a THR from the very first semester of employment.

- The University has also introduced the Ph.D. Scholarships Award Scheme. The general aim of the scheme is to reward faculty members who have been able to demonstrate an excellent recent research record. The scholarships are awarded to faculty members who fulfil the selection criteria of the scheme and who have a suitable Ph.D. candidate in their field. All full-time faculty members of the University who hold the rank of Assistant Professor or higher are eligible to apply for the award. The Ph.D. scholarships are awarded to the most promising candidates of any nationality. They cover the tuition fees of new Ph.D. students for the whole duration of their studies. Five (5) such scholarships have been announced for the academic year 2021-22.

- Following the Ph.D. scholarships award scheme, the University enhances Ph.D. students with the Policy for the Award of Scholarships for publishing a Scopus paper. This scheme awards scholarships to Ph.D. students who have presented an article to a Scopus Conference or published a paper in a Journal indexed by Scopus. The scholarships are in the form of a tuition fee exemption.

- In addition, an annual budget of 1470 Euro is available for each full-time faculty member, for participation in local and/or international conferences.

- A further, annual budget of the order of 120 Euro is available for each full-time faculty member, for subscription in scientific and professional associations.

At European University Cyprus, we consider Academic staff professional development not to be an optional or occasional activity. We believe that that regular participation in professional development activities should be an expectation for all. The well-known three-legged ‘stool’ of academic life - teaching, research, and service - has been assumed to cover the main responsibilities of academic staff. We consider that the academic staff professional development is the ‘missing leg’ that would add strength and stability to the ‘stool’. We consider that professional development and learning promote continuous, career-long growth based upon not only the trial and error of experience, but also theory, research, and professional collaboration with colleagues. The understanding of instructional concepts and teaching processes can be expanded and deepened via professional development. Hence, we consider that ‘good’ teaching in tertiary education is not just a “you have it, or you don’t” skill, nor is it an automatic companion of terminal, disciplinary degrees. It is an action, process, and way of thinking and as such it constitutes serious, complex intellectual work. It thus requires regular reflection and exposure to new ideas and information that are inherently a part of good professional development activities. It is not, however, remedial or something only for those having problems, but should be an integral part of all academic staff’s efforts to become more effective in the classroom. Further, any professional development activities connect instructors

across disciplines and career stages, serving to create a pedagogical community within the University. Professional development provides opportunities to learn about learning, about teaching, about students, and about themselves. EUC has therefore established three (3) academic staff professional development schemes organized, offered, evaluated and revised by the Office of the Vice-Rector of Academic Affairs (see Appendix 13 Professional Development).

For all of the reasons above, the University through its Faculty Development Program (offered by the C.I.Q.A. Faculty Development Standing Committee) organizes and delivers various seminars on a semester basis on issues pertaining to teaching and learning, and research in higher education which emerge through feedback and needs identified by academic staff, as well as in the context of current needs and developments such as those brought by the pandemic. Seminars provided during the current academic year have aimed to support staff both in their teaching, particularly in the extreme circumstances brought by the current pandemic, as well as their research through the offering of various seminars on teaching and learning in online environments as well as on research ethics (see F2020-S2021 program and F2021 Preliminary Faculty Development Program in Appendix 5). Seminars planned for the next academic year will involve the offering, as usual, of both compulsory and optional seminars. Compulsory seminars are addressed to newly hired staff (both full-time and part-time) and optional are addressed to all staff who are strongly encouraged to attend and, as previous experience has shown, in fact do so for there is an established University culture that values continuous education and professional development.

Further, in an effort to better address more program- and discipline-specific needs in the various scientific fields, Schools and Departments are to organize and offer on a semester basis in-house professional development seminars catered to their needs so as to support the creation of a learning and research community within their Departments and Schools through the exchange of best practices as well as recent scientific developments in their respective fields (an example of such activity, is the organization of a seminar to explore best practices for online interactive activities during online teaching in light of Covid -19).

4. Student admission, progression, recognition and certification

(ESG 1.4)

Areas of improvement and recommendations

1. The EEC believes that by providing clear admission criteria and requirements to students, it will assure the admittance of students with the appropriate academic background, and hence reduce possible dropout cases.
2. To attract students, especially international ones, it may be helpful to actively promote and advertise the positive values and high potential of this program to prospective students (e.g., through promotion in secondary schools), and relevant stakeholders.

Response by EUC:

1. **Providing clear admission criteria and requirements to students**

The admission criteria for Computer Engineering students follow the general university admission criteria, as these are foreseen in the University's Charter. All applicants must have completed a secondary (high) school education or twelve years of schooling to be considered for admission to undergraduate study. EUC recognizes a strong academic performance at high school level as the primary determinant for undergraduate university level success The University is interested in applicants with a solid high school record, evidence of extra-curricular involvement, a high level of commitment, and potential for personal growth. Applications for admission to EUC, together with the applicant's credentials, are examined and evaluated by the Office of Admissions, which makes the final decision for the application. The Office of Admissions checks that students have the appropriate academic background, so as to reduce possible dropout cases. Table 1 below shows the number of students that have applied for the Computer Engineering Program as compared to the number of accepted students per year. As can be seen, the Office of Admissions accepted only the students that fulfilled the aforementioned submission criteria. Further, in order to address any weaknesses in the students' background the Department has paid special attention when structuring the introductory courses in English and Mathematics. The content is carefully set so as to allow students to fill out any gaps in their knowledge. This ensures that they overcome any difficulties and further reduces the possibility of them dropping out.

Table 2

Number of Students applying as compared to number of students being accepted in the program

Computer Engineering	2017	2018	2019	2020
Applications	18	16	13	11
Registrations	14	13	6	10

2. **Marketing to attract local and international students**

The Marketing Department is constantly changing its promotion strategies to attract both local and International students. The Marketing Department has recently updated the page of the Computer Engineering Program. It has included the Student Ambassador link which enables

prospects and applicants to chat with a current student of the program and get first-hand information on what is like to be a student at EUC. Our ambassadors provide an insight onto the program, but also on life in Nicosia, issues concerning housing etc. and help others explore EUC from a student's perspective. The Marketing Department has also replaced the corporate video of the University with a video of the department to have a more relevant video on the page. Please follow the link for more details: https://euc.ac.cy/en/programs/bachelor-computer-engineering/

Following are some of additional ways we have used to promote the Computer Engineering program:

Promotional Video:
The promotional video of the Department with a reference to the program is used in video campaigns.

Online Presentations and Roadshows:
The program is promoted in presentations and roadshows organized by the Department of Marketing and the Office of Admissions on a yearly basis. The University also periodically invites students from high school to give them a tour of the University and present to students the high potential of the Computer Engineering program. In light of Covid-19, the University is currently carrying out online presentations to a number of high schools across Cyprus.

Advertisement in Cyprus

Promotion in Cyprus involves local media, billboards, etc. and also includes Facebook promotion. Please see, for instance:
Landing page url: https://euc.ac.cy/en/programs/bachelor-computer-engineering/
Campaign's url: https://fb.me/aBe4zdldDWr7pj

International Students: Advertisement in Greece
We have promoted the program in advertorials in Greece.

International Students: Global Support Fund
Global Support Fund offers reduction in tuition fees for a number of programs and focuses on International students. The Computer Engineering program is included in this Fund. The fund appears on our University's website and it has been promoted in countries such as Kuwait, UAE, Qatar, Jordan, Vietnam, and Israel. The Global Support Fund will be repeated this year for those who will apply for Fall 2021. Please see more about the Global Support Fund at: https://euc.ac.cy/en/global-support-fund-for-international-students/

5. Learning resources and student support

(ESG 1.6)

Areas of improvement and recommendations

1. Further make use of the newly established research collaboration with other institutes to benefit students in the CE program.

Response by EUC:

The faculty members of the Computer Engineering program of study have established strong collaborations with a significant number of reputable academic institutions through the Erasmus+ mechanism and through local and international funded research projects which are currently implemented by the Department's research laboratories.

Naturally, undergraduate students predominantly take advantage of the Erasmus+ scheme to complete part of their degree in one of our collaborating institutions. However, students (especially senior-level ones), are also encouraged to participate in research activities wherever this is possible and appropriate. In this way, students have the opportunity to work from an early stage through these projects and thus gain hands on experience on more practical aspects of computer engineering. The EEC had the opportunity to talk directly to Computer Engineering graduates who benefited directly from participating in the implementation of research projects, like Mr. Vasileios Frangos.

Furthermore, European University Cyprus, following an institutional review process, was accepted (July 2020) as a full member of the prestigious universities of the Utrecht Network". The Utrecht Network has 32 university members among the most high status and historic universities in Europe from 26 countries as members. They all share a common mission, which is to share best practices and enhance the internationalization and research process. The Utrecht Network has additional established links with partner networks in the USA (MAUI Network), Australia (AEN), and the Brazilian REARI-RJ Network. Members of the network collaborate on research and academic activities such as student and staff mobility, joint projects, scholarships, and internships for students.

The program also capitalises on the University's strong alumni network under the umbrella of the University's Career Centre. The University strengthens its alumni bond by engaging them on a number of grounds, as follows:

- Through the CSM platform used by 38 companies which are led by EUC Alumni and multiple international companies. The CSM Career platform empowers Alumni, years after graduation to source Career Development opportunities and remain informed about upskilling and retraining events.
- Though a monthly Career Newsletter promoting events, current issues and vacancies is distributed. The Newsletter is sent to 23,780 students and Alumni.
- Through a dedicated website for our Alumni (https://alumni.euc.ac.cy/), where Alumni may obtain information on numerous actions, activities and initiatives.
- Through the University LinkedIn page, whereby the alumni is informed about the Career Center's services and is also encouraged to consider recruiting among peers. In doing so, the Career services promote interconnectivity among graduates as well.

- Through the creation of Alumni Chapters in other countries, such as in Greece. In doing so, more alumni can interconnect and use the existing structures and opportunities, but even more importantly, extend the Career Center's international identity.
- Through the Alumni LLLP (Annual Alumni Life Long Learning Program) offering seminars/webinars training on a plethora of topics to alumni throughout the world.

These efforts maintain an open communication channel with our alumni, enable the constant provision of valued information/activities to alumni and enhance their bonds. They ensure continuous mutually-beneficial collaboration among alumni, faculty and existing students, and increase opportunities for our existing students to work on research projects, internships etc.

In sum, as the Program's activities are continuously strengthened, and the number of collaborations grow rapidly, students of the Program will be provided with an increasing number of opportunities to participate in international research activities.

6. Additional for doctoral programmes

(ALL ESG)

N/A

7. Eligibility (Joint programme)
(ALL ESG)

N/A

B. Conclusions and final remarks

EEC: Areas of improvement and recommendations

Among a number of recommendations provided above, the EEC would like to highlight the following key suggestions to further improve and strength the Program:

1. Collect and communicate relevant statistics (e.g., number of applicants, student acceptance rate, examination pass rates, etc.) and student feedback results on teaching quality to facilitate timely monitoring and improvement of the Program.
2. Monitor and identify the causes of the relatively high drop-out rate and follow up with support for students who transfer to other programs. Provide clear admission criteria and requirements to prospective students will be helpful for admitting students with appropriate academic background and reducing possible drop out.
3. Engage and receive feedback from international experts in the related fields to keep up with curriculum development of similar degree programs at other leading universities (e.g., to incorporate courses on artificial intelligence and machine learning). This also helps identify strategic areas of expertise for faculty recruitment.
4. To enhance the industrial relevance and visibility of the program, it is helpful to develop additional relationship and collaboration with industries and public sectors in order to increase participation and strength the internship program. Furthermore, it is also desirable to develop relations with proper stakeholders (i.e. schools at the national and international level) and dissemination channels to attract students, especially international ones.
5. It would be helpful to define and announce clear career development policies such as tenure and promotion processes and criteria for faculty members. Although such policy information may have been provided to faculty members, it was not made available to the EEC.

Response by EUC:

We would like to thank the EEC for its recommendations that strengthen the Computer Engineering program. We have gone over their suggestions and comments and have either given more information with regards to our processes and procedures and/or have taken actions to address them. We hope that we addressed all concerns of the EEC at a satisfactory level. This is of utmost importance to us as our strategy is to keep improving at all levels.

Summarizing in brief some of the major adaptations described in more depth in our responses in the previous sections of the Report with regards to the key EEC suggestions, we have taken the following actions:

1. **Collect and communicate relevant statistics and student feedback results on teaching quality:**

We agree with the EEC that relevant statistics need to be communicated to faculty and staff as a means of monitoring and improving the Computer Engineering Program. There are already established procedures regarding this aspect at EUC. More specifically, data are collected from the admissions office and from the students periodically and are passed through different levels of inspection by various committees and chairpersons.

A Course Evaluation mechanism is already in place (named the Survey on ‘Student Feedback on their Learning Experience’ -SFLE) that provides students the opportunity to evaluate their

courses and collect statistics. The statistics are forwarded to faculty to review and act accordingly. The Chairperson of the Department also reviews the aggregated information per course and makes recommendations where needed.

Furthermore, every year a Quality Assurance assessment following the structure set out by the Program Evaluation Review (PER) procedure (please see the Internal Regulation on the procedure in Appendix 1) requests all relevant statistics from the Department of Enrolment of the University and executes an assessment. This process establishes transparency among related faculty, stuff and students, and promotes a detailed discussion to resolve any issues or discuss future improvements. The PER process is an integral part of the University's overall Quality Assurance process.

Additionally, the collection of statistics allows the monitoring of students based on their GPA (Grade Point Average) by student advisors, the Schools' program coordinators, Chairpersons, and Dean. Student Advisors come into communication with students to address issues and assist those with low GPA, by monitoring their academic path and discussing ways to improve performance (see Appendix 2). Lastly, High Achievers are also identified through this process and are rewarded annually with Academic Excellence Scholarships and Certificates of Excellence.

2. Drop-out rate and clear submission criteria:

We would like to thank the Committee for pointing this out. Based on the news reports given (see previous discussion in Section 1), the drop-out phenomenon is well-known in STEM-related programs of study. Even though, our drop-out rate statistics are within the normal range, European University takes this phenomenon very seriously and tries to limit it as much as possible via a series of policies and activities.

Firstly, European University Cyprus implements a '**Low GPA Policy**' at the beginning of each semester. The policy ensures 1) the provision of correct information to all students, namely students in undergraduate, postgraduate (both Conventional and Distance Learning programs of study); 2) that students are aware of the role of GPA and the impact of low GPA on the progress of their studies; 3) increased support provided at the Program, Department and School level; 4) proper implementation of procedures by the Student Advising Centre. The Program Coordinator communicates with each affected student to properly inform and provide support. All student cases are also presented to the Chairperson of the Department, for further discussion and enhancement of the process. For this academic year, we have already initiated this process.

Secondly, further actions are taken by each instructor/student advisor individually (e.g., by reporting absences, continuous polling of students) aiming for a timely and early enough detection of issues and facilitating an effective, early intervention.

Thirdly, care is taken so that newly admitted students can cope with the program and will not drop out. This is done by carefully assessing the qualifications of applicants. The admission criteria for computer engineering students follow the general university admission criteria, as these are foreseen in the University's Charter. EUC recognizes a strong academic performance at high school level as the primary determinant for undergraduate university level success. The University is interested in applicants with a solid high school record, evidence of

extra-curricular involvement, a high level of commitment, and potential for personal growth. The Office of Admissions checks that students have the appropriate academic background, so as to reduce possible drop-out cases (relevant statistics have also been presented in Section 4).

Lastly, in order to address any weaknesses in the students' background the Department has structured the introductory courses in English and Mathematics in such a manner that the content fills out any gaps in their knowledge. This ensures that students overcome any difficulties and further reduces the possibility of them dropping out.

3. Feedback from international experts, Introducing artificial intelligence and machine learning, and identifying strategic areas of expertise for faculty recruitment:
We thank the EEC for the suggestion to include international experts from leading universities to aid with curriculum development. After the suggestion of the EEC committee, the Departmental Council, during its meeting on March 19, 2021, has decided to a modification of the Industrial Advisory Board composition so that at least one members of the IAB is an international expert in the field. Feedback from the IAB is an integral part of the PER evaluation process for the quality assurance policy. This will ensure a better international alignment and the inclusion of state-of-the-art computer engineering topics that will make the program even more competitive. We have already recruited one international faculty, Prof. Mohsen Guizani and planned to have the first meeting a semester after this program runs (Jan - Feb 2022).

Further, we have included Artificial Intelligence and Machine Learning in our program. We believe that these topics will be beneficial to our students and will improve our program. We introduced CSE330 Artificial Intelligence as a Major Elective course. Machine Learning will also be offered under the Major Elective ECE450 Contemporary Topics, which aims to cover hot topics in Computer Engineering that are not in the current curriculum of the Computer Engineering Program. The aforementioned topics bring the total of major electives to 9 instead of 8 (of which students will have to choose 4).

As suggested by the EEC, getting advice from International experts will also assist us in identifying strategic areas of expertise for faculty recruitment. This is also a top priority of the School of Sciences Academic Plan Strategy. More specifically, the School immediate objectives are to proceed with targeted faculty additions so as to deepen academic expertise and to allow sustainable growth, to support current and future programs, and to strengthen its research capacity and output. This is also an aspect that we have investigated at the Department level. We have identified the needs for embedded/IoT devices, automation, security and hardware programming based on the rapid industrialization and urbanization of developing countries, the massive penetration of Cloud Computing and the Internet, and the increase in IoT applications. Following the latest ACM/IEEE guidelines, we placed emphasis on embedded laboratories and hands-on experimentation with focus on embedded hardware programming, security, artificial intelligence, and robotics. Hence, since February 2019, we have proceeded to hire four (4) new faculty supporting these new directions. Through the PER process we plan to continuously evaluate our program, with feedback from various sectors, including International Experts in the field, as suggested by the EEC.

4. Develop relations with proper stakeholders to enhance industrial relevance and visibility of the program, strengthen internship program, and attract national and international student:

European University strives to build stronger relationships as well as develop new relationships and collaboration with industry, public sectors, and other local and international universities. Currently, the Computer Engineering faculty have strong collaborations with a number of reputable academic institutions through the Erasmus+ mechanism and through local and international funded research projects. Undergraduate students predominantly take advantage of the Erasmus+ scheme to complete part of their degree in one of our collaborating institutions. Concurrently, through the Erasmus+ mechanism international students have the opportunity to experience university life at our university, which increases publicity for our program and attracts more international students.

Moreover, students are encouraged to participate in research activities of our computer engineering labs, if opportunities map to the student's capacity, skillset, and interests. Thus, students gain hands on experience on more practical aspects of computer engineering. In addition, the process established in the ECE418 Internship Project course allows students to work on internship projects offered by industry, and fosters more collaboration between industry and the European University Cyprus.

Another key step in increasing visibility of the program and attracting more collaborations is the recent addition of EUC to the Utrecht Network. Following an institutional review process, European University Cyprus was accepted (July 2020) as a full member of the prestigious universities of the Utrecht Network, with a total of 32 universities in 26 countries. European University Cyprus plans to leverage its recent membership in the Utrecht Network to provide more opportunities to students for research and academic activities, such as student and staff mobility, joint projects, scholarships, and internships for students.

Furthermore, European University Cyprus capitalises on its strong alumni network to gain publicity and increase collaborations. The University strengthens its alumni bond by engaging them on a number of grounds (as described in Section 5). This allows for increased opportunities for our alumni, faculty, and current students to work on research projects, internships etc., and draws more international students.

Lastly, the Marketing Department plays a vital role in assisting in this domain. The Marketing Department uses a number of promotion strategies to attract both local and International students. These marketing strategies include local media and Facebook in Cyprus, as well as more traditional methods, such as billboards. The program is also promoted in presentations and roadshows organized by the Department of Marketing and the Office of Admissions on a yearly basis. In light of Covid-19, the University currently carries out online presentations to a number of high school in Cyprus.

Moreover, the Marketing Department constantly updates the website of the Computer Engineering Program. Recently, it has included the Student Ambassador link, which allows current students guide applicants on the program and on university life. The video of the department has also been added (see Section 4 for web links). This promotional video of the department with a reference to the program is also used in video campaigns.

In terms of attracting International Students, the Marketing Department has promoted the program in advertorials in Greece. It has also established a Global Support Fund which offers reduced tuition fees for a number of programs, including the Computer Engineering Program. The fund appears on the European University website and it has been promoted in countries such as Kuwait, UAE, Qatar, Jordan, Vietnam, and Israel. The Global Support Fund will be repeated this year for those who will apply for Fall 2021 (please find more information on the Global Support Fund here: https://euc.ac.cy/en/global-support-fund-for-international-students/)

5. Define and announce clear career development policies- it was not made available to the EEC

European University Cyprus defines several career development policies. The tenure and promotion processes are defined in the faculty promotion policy (see Appendix 10). We apologize for not providing those information to the EEC. In addition, to the faculty promotion policy, there are other policies that assist faculty in the career, such as the sabbatical policy and the research policy. Key aspects of the research policy include the Teaching Reduction policy, annual Research awards, a budget allocation per faculty, PhD Scholarships, etc., (more information is found in Appendices 11-12 and discussed in more detail in Section 3 Teaching Staff of this document).

European University Cyprus also provides Professional Development as a means to give opportunities to faculty to learn about learning, about teaching and research, about students, and about themselves. It has established three (3) academic staff professional development schemes organized, offered, evaluated and revised by the Office of the Vice-Rector of Academic Affairs (see Appendix 13 Professional Development).The Faculty Development Program organizes and delivers various seminars on a semester basis on issues pertaining to teaching and learning, and research in higher education which emerge through feedback and needs identified by academic staff, as well as in the context of current needs and developments, such as those brought by the pandemic (please see F2020-S2021 program and F2021 Preliminary Faculty Development Program in Appendix 5).

Further, in an effort to better address more program-specific and discipline-specific needs in the various scientific fields, Schools and Departments organize and offer on a semester basis in-house professional development seminars catered to faculty needs that facilitate the exchange of best practices, as well as recent scientific developments in their respective fields.

In closing, we would like to say that the Department of Computer Sciences and Engineering found the EEC's candid discussions, a constructive learning process. We all believe that this review was a positive experience and feel that we were provided with important input on how to move effectively forward. In addition, we have thoroughly reviewed the findings, strengths and areas of improvement clearly indicated by the EEC following its review and attempted to respond to each item specifically and succinctly, indicating our actions. By embracing the EEC's comments and suggestions, we are convinced that our programme will be able to more effectively ensure the learning outcomes of its students. In this regards, we are grateful to the EEC for their candid discussions regarding our programme, and the insightful comments and suggestions throughout their report.

C. Higher Education Institution academic representatives

Name	*Position*	*Signature*
Dr. George Hadjichristofi	Program Coordinator Department of Computer Science and Engineering	
Dr. Marina Appiou Nikiforou	Chairperson, Department of Computer Science and Engineering	
Dr. Panagiotis Papageorgis	Dean, School of Sciences	

Date: 05/05/2021

European University Cyprus

INTERNAL REGULATION ON

EUC's PROGRAM EVALUATION REVIEW (P.E.R.) PROCEDURES AND TEMPLATE

62nd Senate Decision: 28 January 2019

Program Evaluation Review (PER) Procedures

1. Rationale and Scope

The Program Evaluation Review (PER) encourages excellence in academic programs by aligning teaching and learning, curriculum, and other academic processes and activities with the mission of individual programs. The process is an essential part of EUC's continued effort to ensure that its mission is met through the delivery of its programs, that EUC programs of study comply, on institutional level, with Standards and Guidelines in the European Higher Education Area, and that EUC programs' structure, content and delivery mode meet stakeholders expectations and needs.

More specifically, the PER's goal is to provide a framework for developing, implementing, and maintaining an ongoing effective program evaluation review process that will:

- Result in the improvement of the program experience of students;
- Follow the standards of the EUC policies and align to accreditation bodies' decisions (e.g. CY.Q.A.A. The Cyprus Agency of Quality Assurance and Accreditation in Higher Education/ΔΙ.Π.Α.Ε. Φορέας Διασφάλισης και Πιστοποίησης της Ποιότητας της Ανώτερης Εκπαίδευσης);
- Assess the quality and enhance the overall effectiveness of the Programs, Departments, Schools and University as a whole;
- Identify the strengths and weaknesses in each program under evaluation review and offer opportunities for improvement;
- Establish program action plans and strategies for continuous and ongoing improvement;
- Utilize the information collected through the PER process to better plan and set priorities at the University level.

2. Sources of Information

The aim of every program is to satisfy the needs and expectations of its stakeholders. As a result, continuous monitoring of needs and expectations is essential. The table below shows the way by which the PER process monitors and collects information from the program stakeholders.

STAKEHOLDER	SOURCES OF INFORMATION	DOCUMENTATION
Students	Course Evaluation Questionnaires	Full report of questionnaires output shall be available at the end of each semester
	Program Committee	Students' representation in the Program Committee. Minutes of meetings
Alumni	Alumni Questionnaires (e.g. Έρευνα Αποφοίτων)	Full report of questionnaires output should be available
	Advisory Board	Alumni representation on the Advisory Board. Minutes of meetings.
	Graduate Employment Reports	Reports
Faculty Members	Program Committee	All faculty members teaching in the program are members of the Committee. Minutes of meetings
		Students' representatives in the Committee. Minutes of meetings
Professionals – Industrialists	Advisory Board	Professional Bodies, Industrialists representation on the Advisory Board. Minutes of meetings
	National & International Professional Bodies Curriculum Guidelines	Established guidelines
	National & International Legislative Directives on Program Curricula	Directives on program curricula
University Management	University Strategic Plan	University strategic plan document
	School/Departmental Strategic Plan	School/Dept. Strategic Plan.
Other		

In order to facilitate the collection of information from the stakeholders and the development of the PER report, the following Committees/Bodies need to be in place (additional to those described in the EUC Charter):

(a) Program Committee:

The School Council appoints a Program Committee (*as EUC Charter: Annex 12, Article VII, Section 2,*) that monitors the academic and other issues of each program. The Program

Committee can appoint sub-committee(s) to handle specific thematic areas and/or collect information.

(i) Terms of reference: The Program Committee shall report to the Department and/or School Council accordingly. For the purposes of the PER procedure the Committee meets at least once per semester. It shall have the following specific responsibilities:

- To oversee and monitor the implementation of the Senate policies and guidelines;
- To monitor curriculum development, delivery and assessment; and make recommendations to the School Council for proposed changes in regulations through the development of the PER report;
- To monitor students' admission and progress;
- To monitor the career path of the Alumni and maintain strong ties between the Alumni and the University;
- To receive and consider the minutes of meetings of the Sub-Committee for the program;
- To receive and consider the summary results of students evaluation questionnaires, as available;
- To provide a forum for discussion of general matters relating to the program;
- To submit the PER report of the program to the Department and School Council through the program coordinator.

The Program Committee Chair comprises the following members:

- The Program Coordinator (*as EUC Charter: Annex 12, Appendix B*);
- The Program's full time teaching personnel, plus selective part time teaching personnel, if necessary;
- Representative of the Administration personnel according to the specific administrative needs, if required;
- Student representatives.

(b) School or Department or Program Advisory Board:

Each program sets up an Advisory Board with the following broad terms of reference and membership.

(a) Terms of reference: The aim of the Advisory Board is to support the Undergraduate and Postgraduate Programs of each Department and School of the European University Cyprus through an independent evaluation of its activities, feedback and constructive criticism. Overall, the Advisory Board will review and contribute in several areas, including the following:
1. Improvement(s) on academic teaching;
2. Evaluation and provision of suggestions regarding the Undergraduate and Postgraduate Programs of the Department and School structure and content; thus providing students with an enhanced learning experience and a high quality educational program;
3. Proposition of courses that link the Department's/School's programs with the needs of the local and global industries, promote internationalization, academic and professional qualification and foremost employability of graduates;

4. Develop mutually beneficial relationships between the faculty, the industry, stakeholders and authorities, aiming to facilitate constructive exchange of ideas, as well as strengthen the links between them;
5. Contribution of unique and innovative ideas for research and its implementation;
6. Promotion of the faculty's work profile outside the University.

(b) Membership: C/o School and Departments.

(c) Expert Review Panel (ERP):

The PER process refers to the evaluation of the report by an Experts' panel with the following terms of reference and membership:

(i) Membership

The Program Review Panel comprises of academic and subject experts, namely:

- Two External Faculty members who are experts on the program thematic areas.

The Program Coordinator (on behalf of the Program Committee) appoints the two external experts.

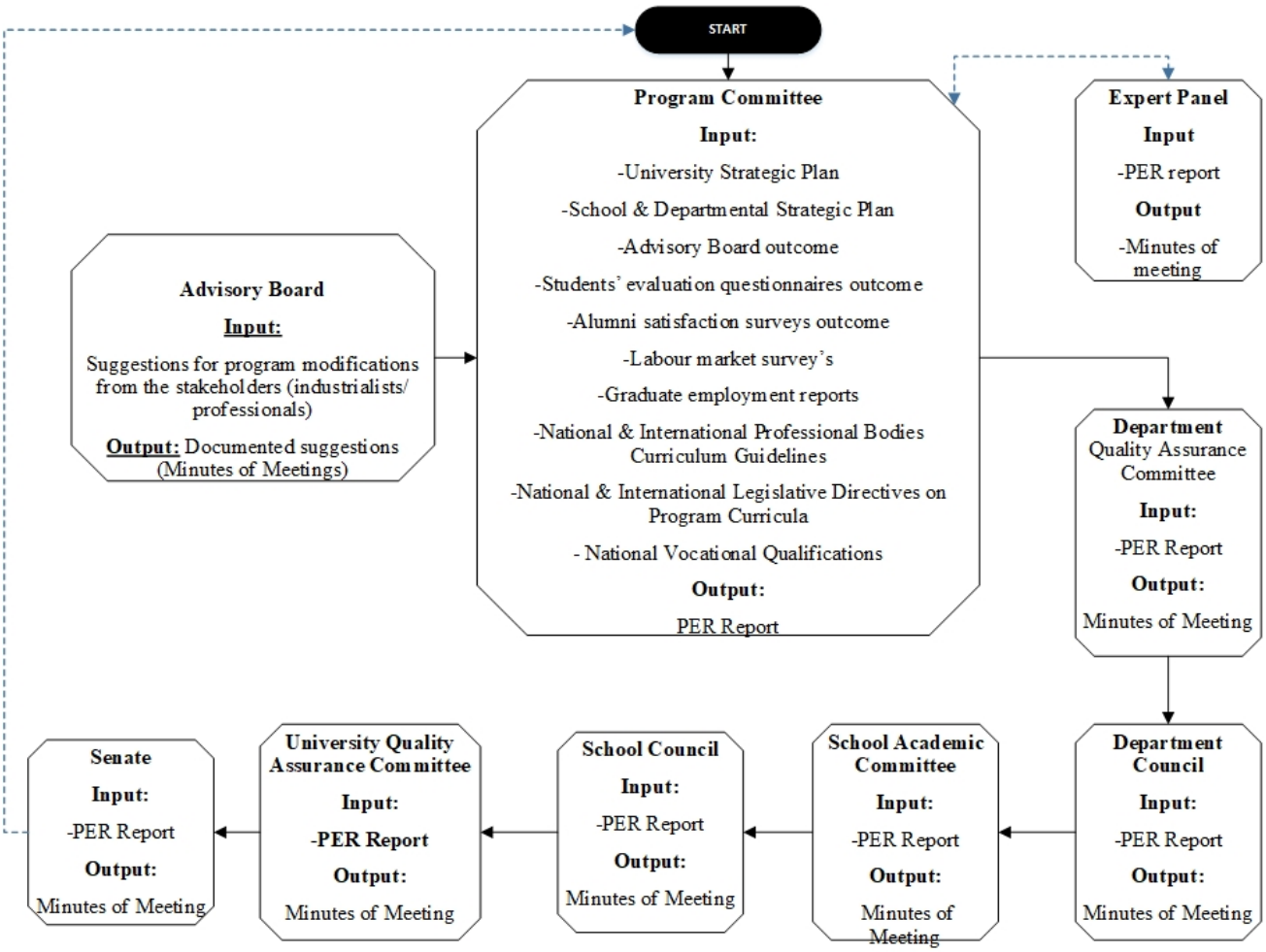
(ii) Terms of reference

The Expert Review Panel provides a written review report by commenting and evaluating the findings and implementation plan presented in the PER, as well as by providing relevant recommendations. The role of the Expert Review Panel is to provide feedback only on the academic elements of the Program Evaluation Review. Decisions about the viability and other aspects of the program remain within the remit of the School and University.

3. The PER Process

The PER process to be followed is illustrated in the diagram below. The PER process is a continuous process. It is expected that each Department implements the PER procedure and prepares the PER report (see Template attached) every five (5) years. The Program Committee can initiate a PER procedure at any time within the five year period suggesting documented program changes.

Diagram: PER Procedure



4. Timeframe

Program Evaluation Review is a continuous process. It is expected that every program should complete a PER process every five (5) years. However, the Program Committee is not restricted with regards to the exact time, as it can initiate a PER report at any time within the five year period suggesting documented program changes.

Schools with a program to be reviewed for the 5 years PER process will be notified by the Office of the Vice-Rector of Academic Affairs ***in early July.*** Since the review process is an ongoing process, the School shall follow all procedures so that the report with the associated documentation is approved by the Senate in its first meeting of the following calendar year.

European University Cyprus

Program Evaluation Review (PER) Template

"Program Title"

School of X

Department of X

Last Review Date: DD/MM/YY

1. Background/Contextual Information

Briefly describe the **status** of the Program in review (provide **headline** information in terms of student numbers, profiles and accreditations). Focus on any significant developments since the last program review.

Briefly present the actions taken since the **last Program Review**, and the progress of the suggested Program Action Plan (if any).

(*Provide references wherever this is applicable / appropriate, see Section ….*)

2. PER methodology

Briefly describe the **methodology** used for the implementation of this review. Refer to how this review is related to the overall University's QA process.

(*Provide references wherever this is applicable/appropriate, see Section …*)

3. PER Data Sets & Other Sources of Information

List the **data sets** and **other sources of information**, which were used for the implementation of this review. Provide as appendix all the documentation.

4. Curriculum Structure, Objectives, and Learning Outcomes

Briefly describe and review the **general structure**/**content** and **rationale** of the Program Curriculum in Review. Possible review tasks, which may be undertaken, are the following:

- Review the relevance and adequacy of the **current Objectives / Learning Outcomes** of the Program in review in relation to the latest research, professional and technological developments (wherever applicable).
- Review how the Curriculum structure and content **satisfies the current Objectives and Learning Outcomes** of the Program in review (cross-reference matrices of 'Courses vs Learning Outcomes' can be designed / used for this purpose).
- Review how the Curriculum's structure / learning outcomes **satisfy the requirements of international standards and professional organisations, as well as any legislative requirements** (if applicable).
- Review how the Curriculum structure / learning outcomes **address stakeholders'** (students, alumni, professionals) **considerations and expectations**.

Feel free to implement any additional / alternative review task you consider appropriate for the Program in review.

(*Provide references this is applicable / appropriate, see Section 2*)

5. Teaching and Learning

Briefly describe and review the **teaching and learning methods, teaching and learning materials, academic personnel, resources, and academic support**, which are provided for the Program in review. Possible review tasks, which may be undertaken, are the following:

- Review the relevance and adequacy of the **current teaching, learning, and assessment methods followed**, in relation to international standards, stakeholders' feedback, and current educational trends.
- Review the adequacy of the **Program's current academic personnel** in relation to the teaching and learning needs of the Program Curriculum, international standards, stakeholders' feedback, School and University Strategy, and requirements from professional bodies.
- Review the relevance and adequacy of the Program's current teaching **resources and academic support** in relation to international standards, stakeholders' feedback, and current educational trends.

Feel free to implement any additional / alternative review task you might feel is appropriate for the Program in review.

(Provide references wherever this is applicable / appropriate, see Section 2)

6. Sustainability

Briefly describe and review the **Sustainability** aspects of the Program in review. Possible review tasks, which may be undertaken, are the following:

- Review the **student recruitment / retention policy**, which is followed for the Program in review, in relation to the latest enrolment, retention, and marketing data.
- Review the **employability dimension** of the Program in review, in relation to the latest alumni satisfaction and graduate employment reports, and in relation to the feedback provided by industrial stakeholders.
- Review how the Program in review fits and contributes to the satisfaction of **the School's and University's long-term strategic plans**.
- Review how the Program in review addresses the latest **national and international professional needs and trends**.

Feel free to implement any additional / alternative review task you consider as appropriate for the Program in review.

(Provide references wherever this is applicable / appropriate, see Section 2)

7. SWOT Analysis

Based on your review, please provide a Strengths/Weaknesses/Opportunity/ Threats Analysis for the Program in Review:

Strengths	**Weaknesses**
1. Strength x 2. Strength y	1. Weakness x 2. Weakness y
Opportunities	**Threats**
1. Opportunity x 2. Opportunity y	1. Threat x 2. Threat y

8. Proposed Program Modifications

Identify the proposed program modifications by providing the necessary documentation on the following areas:

I. Program modifications:

(a) Title
(b) Aim and Objectives
(c) Learning Outcome(s)
(d) Curriculum/Program structure
(e) Entry requirements/criteria

II. Course(s) modifications

(a) Title
(b) Aim and Objectives
(c) Learning Outcomes
(d) Course Content
(e) Teaching Methodology
(f) Assessment Methods
(g) Recommended Textbook(s)
(h) Other (ECTS, hours, etc.)

III. Program quality control mechanisms

IV. Other (Specify)

9. Implementation Plan

Describe the proposed action plan for the proposed modifications/changes in a timetable or Gantt Chart.

INTERNAL REGULATION ON

"EUC"s PROCEDURES FOR SUPPORTING STUDENTS WITH LOW GRADE POINT AVERAGE (GPA)"

71st Senate Decision: 7 February 2020

Aiming to develop a proposal/framework on the process and actions to be taken, in order to address and reduce the phenomenon of students' low G.P.A. and its effects, the actions to be taken in order to help reduce the phenomenon, are:

- the provision of correct information to all students, namely undergraduate, postgraduate, Conventional and Distance Learning;
- ensure that students are aware of the role of GPA and the impact of low GPA on the progress of their studies;
- increase of the support provided at the Program, Department and School level;
- proper implementation of procedures by the Student Advising Centre.

These actions are additional to the efforts/support that each individual instructor provides to each student and aim for a timely and early enough diagnosis of the phenomenon in order to facilitate an effective, early intervention.

The following steps will be followed for all students (both conventional and distance education):

1. **The Department of Enrollment** provides the Schools at the beginning of each academic semester (e.g. third week of October and February, respectively) with a list of their students with a low GPA (for undergraduate courses: below 1.80 except for the School of Medicine where the threshold has been set to 2.0; for postgraduate courses: below 2.5; for Ph.D. courses the issues concern late progress in completing the Ph.D-see sample letter attached).

2. **The School** (this concerns all undergraduate and postgraduate Conventional and Distance Learning Programs of Study)**:**

   (1) ***For first year students at the end of the 1st semester of their studies or for students included in the list for the first time****:*

   Each affected student is called by the Program Coordinator, in order to ensure that, students are aware of the concern of the Department and School, and that students are indeed properly informed that the Department is available to provide support (e.g. Specifically, students are informed about the role and

importance of the GPA, the possible reasons and causes of the low GPA, and ways for improvement of the situation, which may either involve the student (e.g. further effort) or the Department and School).

(2) ***For new students, which continue to be in the same situation at the end of the second semester of their studies or for students appearing in the list for a second time***:
The process presented in Item 1 above is repeated in the presence of the Chairperson of the Department, for further discussion and enhancement of the process, aiming at the most tangible academic targets and the procedures involved. If needed, the Chairperson of the Department and the Program Coordinator will request the presence of the Dean.

(3) ***For students who exhibit the phenomenon on a continuous basis****:*
The possibility of sending a letter from the Dean to the student (registered, in the home address) is considered (see attached "Sample" letters).

For the School of Medicine (undergraduate degrees) in more specific: The students with a GPA lower than 2.0 receive a “Letter of Probation” before the beginning of the second academic year of their studies (September). Students who received a “Letter of Probation” and still maintain an unacceptably low GPA will be given only one last opportunity to correct their GPA during the coming semester (Spring). At the end of the Spring semester of their second year of studies,, these students (e.g. those who have already received a letter of warning in the past), and continue to maintain a very low GPA will receive a “Letter of Dismissal”, with the option to either change their program of study (e.g. transfer to biology) or to withdraw from the School. Those students who, on the other hand, have not yet received a “Letter of Probation” in the past, but perform unsatisfactorily, will receive a “Letter of Probation” at the end of the Spring semester of their second year of studies, with subsequent consequences should their performance not improve. This option will be provided this one and only time to those students with failures; no other opportunity will be provided to improve “F” grades. Each student will be notified accordingly, depending on their status.

3. The Department of Enrollment:

Each Student Advisor:

(1) Contacts/communicates with students and ensures that each student is well informed and advised about the University’s grading system and the role of GPA ;

(2) In the case of students not passing a course, the advisor re-registers them to the same course in order to immediately delete the received F, and thus avoid accumulation of F's. This takes places in the exact following semester in case the affected course is a prerequisite to other courses, in order to avoid accumulation of F’s;

(3) Student advisors are in constant communication with the Program Coordinators in order to secure this process.

Encl.: (1) Sample Letters (Greek and English version)
(2) Sample Letter of Probation (School of Medicine)
(3) Sample Letter of Dismissal (School of Medicine)
(4) Sample Letter for Ph.D. Students (Department of Enrollement)

..... 2020

Προς
.....

Θέμα: Χαμηλός Μέσος Όρος Βαθμολογίας (G.P.A.)

Αγαπητή/έ.....,

Σε συνέχεια της αναφοράς του/της Προέδρου του Τμήματος και του/της Συντονιστή/τριας του Προγράμματος που παρακολουθείτε κατά το περασμένο ακαδημαϊκό εξάμηνο, παρακαλώ σημειώστε ότι ο μέχρι τώρα μέσος όρος της βαθμολογίας σας (G.P.A.) είναι .....

Θα ήθελα να σας υπενθυμίσω, επί του προκειμένου, τους κανονισμούς του Πανεπιστημίου μας αναφορικά με τις προϋποθέσεις απόκτησης πτυχίου, οι οποίοι προβλέπουν μέσο όρο βαθμολογίας (G.P.A.) 2.00 και άνω.

Ο/η Πρόεδρος του Τμήματος και ο/η Συντονιστής/τρια του Προγράμματος που παρακολουθείτε μπορούν να σας δώσουν περισσότερες πληροφορίες και σχετική υποστήριξη.

Ελπίζω ότι, κυρίως με την αναβάθμιση των δικών σας προσπαθειών, θα καταστεί δυνατή τόσο μια ποιοτική συνέχιση των σπουδών σας, όσο και η τελική επίτευξη των στόχων σας.

Με εκτίμηση,

.....
Κοσμήτορας,
Σχολή .....

Κοιν.:
-Συντονιστής/τρια Προγράμματος Σπουδών
-Πρόεδρος Τμήματος

European University Cyprus
6 Diogenous str, 2404 Engomi,
P.O.Box 22006, 1516 Nicosia, Cyprus
Telephone: +35722559514
Fax: +357 22559515

Date XXX

Student's Name: xxxxx
ID: xxxx
Program: Doctor of Medicine, MD

Re: Letter of Probation for G.P.A. of less than 2.0

Dear [Name of Student],

I regret to inform you that, due to your low cumulative Grade Point Average (GPA), you are being placed on academic probation. You will remain on probation and will be subject to dismissal until your cumulative GPA reaches or exceeds 2.00.

Academic Probation status is serious. You must raise your cumulative GPA to 2.00 to return to good standing and to receive your degree. According to European University Cyprus bylaws and the decision outlined by the EUC 48th Senate, students with a GPA lower than 1.7 at the end of their second year (year 2) are subject to dismissal (termination).

The School of Medicine is committed to helping you improve your academic performance so that you can return to good standing and make progress toward your degree. We will provide you with the services and activities to help you achieve academic success. In return, you must commit yourself to work diligently. It is my sincere hope that you will be successful next semester.

Sincerely,

Professor Elizabeth O. Johnson
Acting Dean
School of Medicine
European University Cyprus

CC: Professor Ioannis Patrikios, Chair, Department of Medicine
Professor Loizos Symeou,Vice-Rector of Academic Affairs
Dr. Christos Tsiappas, Director of Enrollment

European University Cyprus
6 Diogenous str, 2404 Engomi,
P.O.Box 22006, 1516 Nicosia, Cyprus
Telephone: +35722559514
Fax: +357 22559515

Date XXX

Student's Name: xxxxx
ID: xxxx
Program: Doctor of Medicine, MD

Re: Letter of Dismissal
Dear [Name of Student],

As you are aware, on [date of probation letter] you were placed on academic probation because your cumulative Grade Point Average (GPA) was below 2.00.

After careful review of your academic performance, the School of Medicine must regrettably inform the Rectorate and Director of Admissions that you have not made satisfactory progress and are recommended for dismissal from the Doctor of Medicine, MD, program.

According to European University Cyprus bylaws and the decision outlined by the EUC 48th Senate, students with a GPA lower than 2.0 will not be eligible for graduation.

While you are being dismissed from the program of Doctor of Medicine, you may wish to explore your options of transferring to another program in Life Sciences, such as Biology, offered by European University Cyprus. We will be happy to assist you in this process. We wish you the best in your future endeavors.

Sincerely,

Professor Elizabeth O. Johnson
Acting Dean
School of Medicine
European University Cyprus

CC: Professor Ioannis Patrikios, Chair, Department of Medicine
Professor Loizos Symeou,Vice-Rector of Academic Affairs
Dr. Christos Tsiappas, Director of Enrollment

..... 2020

Προς
.....

Αγαπητή κα,

Με την παρούσα επιστολή θα ήθελα να σας ενημερώσουμε για τα παρακάτω:

Η διάρκεια των διδακτορικών σπουδών του Πανεπιστημίου είναι 3-6 χρόνια με τη δυνατότητα χορήγησης αναστολής φοίτησης μέχρι και ένα (1) ακαδημαϊκό έτος.

Είστε εγγεγραμμένη στο πρόγραμμα διδακτορικών σπουδών στις …… από το Φθινοπωρινό Εξάμηνο 201…., και συνεπώς αναμένεται να ολοκληρώσετε τις σπουδές σας μέχρι το τέλος του Εαρινού Εξαμήνου 202….. Αυτό σας δίνει περιθώριο ακόμη τεσσάρων (4) εξαμήνων φοίτησης. Δείτε αναλυτικά τη σχετική αναλυτική σας βαθμολογία στο συνημμένα.

Επιπρόσθετα, θα ήθελα να σημειώσω ότι είστε εγγεγραμμένη στάδιο υποστήριξης πρότασης διατριβής (PHD801) για έξι (6) συνεχή εξάμηνα (από το S20….).

Με βάση τα πιο πάνω δεδομένα, και επειδή μας προβληματίζει η καθυστέρηση που παρατηρείται στην πρόοδό σας στο Πρόγραμμα, σας ενημερώνω ότι για την εντός του εναπομείναντα χρόνου ολοκλήρωση των διδακτορικών σας σπουδών, απομένουν οι εξής επιλογές:

(α) Μέχρι το επίσημο τέλος του τρέχοντος εξαμήνου (Φθινοπωρινό 20…), θα πρέπει να ολοκληρώσετε επιτυχώς το μάθημα PHD801. Στη συνέχεια θα έχετε στη διάθεσή σας ακόμη τρία (3) εξάμηνα για να ολοκληρώσετε το στάδιο συλλογή και ανάλυση δεδομένων (PHD802) και συγγραφή και υποστήριξη διδακτορικής διατριβής (PHD803).

β) Εάν τυχόν δεν ολοκληρώσετε επιτυχώς το μάθημα PHD801 μέχρι το τέλους του Φθινοπωρινού Εξαμήνου 20…, το Πανεπιστήμιο θα προχωρήσει στην καταχώρηση βαθμολογίας F. Θα μπορείτε να επανεγγραφείτε στον ίδιο κωδικό μαθήματος το επόμενο εξάμηνο με επιπρόσθετο κόστος 1.500 ευρώ. Στη συνέχεια θα έχετε ακόμη τρία (3) εξάμηνα για να ολοκληρώσετε τα μαθήματα PHD801, PHD802, PHD803.

Τέλος, σε περίπτωση που τα πιο πάνω δεν μπορούν να εφαρμοστούν, θα σας δοθεί η δυνατότητα, μετά από υποβολή αίτησης στο Τμήμα Εγγραφών και κοινοποίηση στο/την Πρόεδρο του Τμήματος ……., να επιλέξετε να μετεγγραφείτε από το διδακτορικό στο οποίο φοιτάτε σε ένα μεταπτυχιακό του Ευρωπαϊκού Πανεπιστημίου Κύπρου με αντιστοίχιση μαθημάτων που έχετε ήδη παρακολουθήσει και παρακολούθηση των μαθημάτων που υπολείπονται.

Βασική επιδίωξη του Πανεπιστημίου είναι η στήριξη των φοιτητών και φοιτητριών μας με απώτερο σκοπό την ακαδημαϊκή τους πρόοδο και επιτυχή αποπεράτωση των σπουδών τους.

Τόσο εγώ, όσο και η επόπτριά σας, ο συντονιστής του διδακτορικού προγράμματος και ο/η Πρόεδρος του Τμήματος ….. παραμένουμε στη διάθεσή σας για οτιδήποτε περαιτέρω.

Χρίστος Τσιάππας

Διευθυντής Τμήματος Εγγραφών

APPENDIX 3 – Revised Syllabi

Course Title	Instruction in Expository Writing				
Course Code	ENL103				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	Please apply accordingly				
Teacher's Name	Claire Georghiou				
ECTS	6	Lectures / week	3 hours/ 14 weeks	Laboratories / week	None
Course Purpose and Objectives	The aim of the course is to offer a sound, workable and contemporary process-based approach to writing that blends both traditional organization and terminology with current findings in composition to help university students at a B2 level and above deal with academic writing.				
Learning Outcomes	Upon successful completion of the course students will be able to: • Apply the steps of the writing process to generate ideas, focus, support, draft, revise and edit one's writing • Use a thesis statement, topic sentences and specific support for the traditional academic essay and to write effective introductions and conclusions • Recognize and use various patterns (rhetorical modes) and to evaluate one's writing for unity, coherence and support • Apply the writing process to the development of a research paper; summarizing, paraphrasing, quoting and documenting sources • Produce an argumentative or persuasive essay with concession, rebuttal and proof • Evaluate one's writing for content, organization, mechanical and stylistic errors				
Prerequisites	ENL102 or EPT placement	Co-requisites	None		
Course Content	**Essay Writing:** First, the students become acquainted with the proper form and steps for presenting their ideas and then they are introduced to methods of analysis. These methods involve essay organization processes and they include the following patterns: 1. Cause and Effect 2. Comparison and Contrast 3. Definition				

	4. Division and Classification 5. Process and Analysis 6. Exemplification Finally, the Persuasive essay is thoroughly discussed. All the above essay patterns are approached from different bases for evaluating essay writing such as Unity, Support, Coherence and Sentence Skills. **Research Paper Writing:** Students are introduced to research paper writing. They are required to submit a research paper which must be based on thorough collection of data relating to their topic as well as on careful documentation of their sources.
Teaching Methodology	Face-to-face
Bibliography	• Peter Redman and Wendy Maples, *Good Essay Writing*. (5th edition) Sage, 2017. • John Langan and Zoe Albright, *College Writing Skills with Readings*. (10th edition.) McGraw-Hill, 2019 • Jonathan Weyers and Kathleen McMillan, *How to Write Essays & Assignments*. Prentice Hall, 2011 • Pears and Shields (2019) *Cite them right*, 11edn. Basingstoke: Palgrave Macmillan.
Assessment	Mid – Term Examination 30% Final Examination 40% Assignments and Research 20% Class Participation and Attendance 10% 100%
Language	English

Course Title	Writing for Computer Science and Engineering				
Course Code	CSE215				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	2nd Year / 3rd Semester				
Teacher's Name	Andreas Grondoudis				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The purpose of this course is to train students to create documentation and communication material and effectively deliver it to technical (as well as non-technical) audiences. The objectives of the course include guiding students through: creating technical documents, presenting and describing algorithms, preparing user guides, writing progress reports, completing formal reports as well their bachelor thesis. Additionally, the course aims to explain ethical issues regarding attributing previous knowledge, work and publication authorship, forms of plagiarism and formats of referencing. One more object is to discuss human communication and emphasize on public speaking as a means to effectively deliver material.				
Learning Outcomes	• Use LaTeX as an editor for preparing documents • Explain academic honesty and practice correct ethics • Generate elementary academic discourse papers • Design and write technical documentation like user manuals • Perform elementary fact-finding as well as knowledge discovery research. • Create citations and generate standard formatted references/bibliography • Explain the models of human communication • Create and orally present short (informative or persuasive) speeches				
Prerequisites	ENL103	Co-requisites	None		
Course Content	Technical writing Definition of the writing style for computer science and engineering, examples of documents used by academics and practitioners in the fields of computer science and engineering, first look at specific writing styles for specific needs inside the computer science and engineering professions, establishing the audience. Ethical writing				

	Definitions of plagiarism, mis-representation, cheating, and fabrication. Ethics and technical report writing, IEEE Ethics, ACM Ethics. Requirements Specification: Tabulating the client's needs, performing the requirements specification interview, writing the software requirements document, writing the formal specification document. Documentation: Dissecting algorithms and providing effective documentation, code commenting guidelines, user manual writing. Report writing: Progress report writing, establishing credibility in describing work performed, describing milestones and achievements, convincing the audience that progress is made, explaining problems and requesting assistance or guidance. Academic writing: Literature review, citations, and reference styles, paper structure, writing about methodology, writing about experiments, writing conclusions and discussion, describing future work. Human communication Theory, models of communication, the communication process, competence in communication. Verbal and non-verbal communication, perception of communication Public speaking Steps of speech development, organizing a speech, knowing your audience, researching material. Types of speeches (informative vs persuasive). Key point on delivering a short speech. As part of the course, students will use the LaTeX document preparation & management system and become familiar with using the software to produce example reports, documents, user manuals, bibliography files and more.
Teaching Methodology	Class instruction; Consultations; Laboratory sessions; Coursework; Personal study
Bibliography	Zobel J., Writing for computer science, Springer, Latest edition Silyn-Roberts H., Writing for science and engineering, papers, presentations and reports, Elsevier, Science Direct, Latest edition Markel M., Technical communication, Bedford, Latest edition Finkeistein L., Pocket book of technical writing for engineers & scientists, McGraw-Hill, Latest edition

	Adler R.B., Rodman G., Understanding Human Communication Oxford University Press, Latest edition Pearson J., Nelson P., Titsworth S., Hosek A., Human Communication, McGraw-Hill Education, Latest edition
Assessment	Class Participation and Attendance 10% Coursework 35% Oral presentations 20% Examination(s) 35% 100%
Language	English

Course Title	Physics I				
Course Code	PHY100				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1st Year / 1st Semester				
Teacher's Name	Charis Christodoulou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to provide students with a comprehensive introduction to the science of Physics and the basic laws of mechanics. The course follows an embedded laboratory approach, where students are required to utilize a variety of experimental tools during the implementation of lectures.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Appraise that Physics is the fundamental science upon which all other natural sciences and engineering are built. • Identify the distinction between fundamental and derived quantities. • Recognize and describe the basic laws of mechanics and use these laws to solve a wide range of related problems. • Identify the need for experimental verification or rejection of theoretical assumptions and predictions. • Carry out a series of result experiments • Appraise the impact that Physics has on our everyday lives by formulating and solving problems from the real world				
Prerequisites	None	Co-requisites	None		
Course Content	Vectors: Vector and Scalar quantities. Vector addition and subtraction. Graphical addition. Resolution of vector into components. Uniformly accelerated motion in one dimension: Speed, average velocity, instantaneous velocity. One dimensional motion. Acceleration, uniformly accelerated linear motion. Newton's laws: Inertia and mass. Newton's first, second and third laws and applications. Friction. Static equilibrium:				

	Bodies in equilibrium. Torque of a Force. Conditions for equilibrium. The center of gravity. Work and Energy: The definition of work. Power, kinetic energy. The work-energy theorems. Gravitational potential energy. The conservative nature of the gravitation force. The law of conservation of energy. Linear Momentum: The concept of linear momentum. Newton's second law restated. Conservation of linear momentum. Elastic and Inelastic collisions. Motion in a circle: Angular displacement, velocity, acceleration. Centripetal and Tangential acceleration and force. Gravitation: Kepler's laws. Newton's law of gravity. Satellites, parking orbits, escape speed. Vibration and Waves: Periodic motion. Simple harmonic motion. Forced oscillations and resonance. Transverse and Longitudinal Waves. Reflection, Refraction and Diffraction of Waves.
Teaching Methodology	Face- to- face
Bibliography	"Physics for Scientists and Engineers", by P.A. Tipler and G. Mosca, "Introductory College Physics", by J.F. Mulligan "Physics for Engineers and Scientists", by H.C. Ohanian "Principles of Physics", by F.J. Bueche
Assessment	Examinations 85% Assignments/Lab 5% Class Participation and Attendance 10% 100%
Language	English

Course Title	Physics II				
Course Code	PHY110				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1st Year / 2nd Semester				
Teacher's Name	Charis Christodoulou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to provide students with a contemporary and modern view of electromagnetism and optics and to allow them to understand the fundamental principles of these areas. The course follows an embedded laboratory approach, where students are required to utilize a variety of experimental tools during the implementation of lectures.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Recognize the physical laws on phenomena from electromagnetism, electromagnetic waves and circuits and solve a wide range of related problems. • Describe phenomena in which light exhibits wave-like properties. • Describe phenomena in which light exhibits particle-like properties. • Carry out a series of experiments in electrostatics, magnetism and electromagnetism				
Prerequisites	PHY100	Co-requisites	None		
Course Content	Electric forces and fields: Forces between charges. Coulomb's law. Insulators and Conductors. Conservation of charge. The Electric field lines in various systems. Electric Potential: Electric potential and potential energy. Potential difference, Equipotential surfaces. Capacitors, dielec¬trics. Direct-current circuits: Electric current. Ohm's law. Electric circuits and Kitchhoff's rules. The EMF and terminal potential of a battery. Magnetism:				

	Magnetic fields. Force on a current carrying conductor carrying conductor in a magnetic field. Forces on moving chan¬ges. Magnetic fields produced by current carrying conductors. The earth's magnetic field. Magnetic materials. Electromagnetic induction: Magnetic flux Induced EMF, Faraday's law. Self and Mutual induction. The energy in a magnetic field. Electromagnetic waves: The electromagnetic wave's spectrum. Maxwell's equations (qualitative presentation). Physical Optics: Coherence. Interference of light in Young's double-slit experiment. Interference in thin films. The diffraction grating, diffraction by a single slit. Recent developments and contemporary issues pertaining to the subject-matter of the course.
Teaching Methodology	Face- to- face
Bibliography	"*Physics for Scientists and Engineers*", by P.A. Tipler and G. Mosca, "*Introductory College Physics*", by J.F. Mulligan "*Physics for Engineers and Scientists*", by H.C. Ohanian "Principles of Physics", by F.J. Bueche
Assessment	Examinations 85% Assignments/Lab 5% Class Participation and Attendance 10% 100%
Language	English

Course Title	Mathematical Foundations for Science and Engineering				
Course Code	MAT140				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1st Year / 1st Semester				
Teacher's Name	Ioannis Michos				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course blends the concepts and skills that must be mastered before enrollment in a college-level calculus course. Students will continue to build on their algebra and geometry foundations aiming the expansion of their understanding through other mathematical experiences.				
Learning Outcomes	Upon successful completion of the course, students will be able to: • Solve problems by applying elementary algebra. • Produce graphs of polynomial equations of first and second degree and to explain features of the graphs such as: intercepts, vertex, slope, line of symmetry and translations. • Recognize functions and to perform operations on functions such as: addition, multiplication, division, composition. • Identify the domain and range of a function and solve problems involving the domain and range. • Identify and solve problems involving inverse functions, exponential and logarithmic functions and equations. • Solve problems involving systems of two equations in two unknowns, using the method of substitutions or the theorem of equivalent systems. • Interpret the six trigonometric functions in terms of both the right triangle definition and the circular definition and use the basic trigonometric identities to solve trigonometric equations. • Perform basic operations with complex numbers.				
Prerequisites	None	Co-requisites	None		
Course Content	Algebra and Real Numbers, Exponents, Radicals, Basic Operations and Factoring of Polynomials, Basic Operations of Rational Expressions Long Division of Polynomials, Partial Fraction Decomposition				

	Linear Equations and Applications, Quadratic Equations and Applications Linear Inequalities, Absolute Value, Linear Inequalities with Absolute Value, Complex Numbers and Polar Form Cartesian Coordinate System, Distance Formula, Equation of a Line (slope-intercept and point-slope forms), Parallel and Perpendicular Lines, Equation of a Parabola (polynomials of degree 2), Completing the Square, Equation of a Circle Functions, Domain and Range, Graphs and Transformations of Functions, Operations on Functions and Composition Inverse Functions, Exponential and Logarithmic Functions, Graphs and Properties of Exponential and Logarithmic Functions, Exponential and Logarithmic Equations Angles and Their Measure, Trigonometric Functions using the Unit Circle, Solving Right Triangles, Graphs and Properties of Trigonometric Functions, Basic Trigonometric Identities. Recent developments and contemporary issues pertaining to the subject matter of the course
Teaching Methodology	Face- to- face
Bibliography	Barnett, Ziegler, Byleen, PRECALCULUS McGraw-Hill (Latest edition) Sullivan, M., PRECALCULUS, Pearson-Prentice Hall (Latest edition) Sullivan & Sullivan, PRECALCULUS concepts through functions, Prentice Hall (Latest edition) Huettenmueller, R., PRECALCULUS Demystified, McGraw-Hill (Latest edition) Stewart J., Redlin L., Watson S. PRECALCULUS: Mathematics for Calculus, Prentice Hall (Latest edition)
Assessment	Examinations 90% Class Participation and Attendance 10% 100%
Language	English

Course Title	Calculus I				
Course Code	MAT150				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1st Year / 2nd Semester				
Teacher's Name	Demetris Hadjiloucas				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to provide, together with Calculus II, a good working knowledge of calculus, a powerful mathematical instrument in engineering and science.				
Learning Outcomes	Upon successful completion of the course, students will be able to: • Recall the essential algebraic properties of functions • Evaluate the limit of a function • Calculate the derivative of a function using various techniques • Manipulate derivatives to solve real life problems • Use derivatives to describe the characteristics of the graph of a function • Recognize antidifferentiation as the reverse of the differentiation process and apply it in appropriate circumstances • Employ antiderivatives (integrals) in the solution of area problems				
Prerequisites	MAT140	Co-requisites	None		
Course Content	Introduction to Limits. One-Sided Limits. The Limit Theorems. Infinite Limits and Limits at Infinity. Introduction to the Derivative. Tangent Lines and Derivatives. Derivative at a Point. The Derivative Function. Differentiability on an Open Interval. The Derivative as a Rate of Change. Instantaneous Velocity. Continuity. Types of Discontinuity. Upper and Lower Bound Theorem. Intermediate Value Theorem.				

	Differentiation Rules. The Product and Quotient Rules. The Derivative of Composite Functions: The Chain Rule. The Power Rule. The Derivative of a Power Function. The Derivatives of the Trigonometric Functions. Implicit Differentiation. Higher-Order Derivatives. Related Rates of Change. The Mean Value Theorem. Elementary Curve Sketching I: Increasing and Decreasing Function and the First Derivative Test. Asymptotes. Elementary Curve Sketching II: Concavity and the Second Derivative Test. The Theory of Maxima and Minima. Maxima and Minima; Applied Optimization Problems. Indeterminate Forms and L'Hôpital's Rule. Antiderivatives. The Sigma-Notation. Approximations to Area. The Definite Integral. Existence of Definite Integrals. The Fundamental Theorem of Calculus. Integration by Substitution. The Area Between Curves. Recent developments and contemporary issues pertaining to the subject matter of the course
Teaching Methodology	Face- to- face
Bibliography	Weir/Hass/Giordano., THOMAS' CALCULUS , Pearson/Addison Wesley (Latest edition) Stewart J, SINGLE VARIABLE CALCULUS, Thomson Brooks/Cole (Latest Edition) Anton, H., CALCULUS WITH ANALYTIC GEOMETRY, Wiley (Latest edition) Adams R., Essex C., CALCULUS: A complete course, Pearson (Latest edition) Morris C., Stark R., FUNDAMENTALS OF CALCULUS, Wiley (Latest edition)
Assessment	Examinations 90% Class Participation and Attendance 10% 100%
Language	English

Course Title	Linear Algebra				
Course Code	MAT160				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	2nd Year / 3rd Semester				
Teacher's Name	Ioannis Michos				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	A brief review of matrices and matrix operations is followed by a presentation of the axioms and properties of vector spaces, and the concepts of linear transformations, eigenvalues and eigenvectors.				
Learning Outcomes	Upon successful completion of the course, students will be able to: • List the basic principles of matrix algebra. • Solve systems of equations using matrices. • Create the intricate thread of relationships between systems of equations, matrices, determinants, transformations and eigenvalues. • Use vector arithmetic including dot and cross products of vectors. • Explain basic concepts such as those of linear independence of vectors, basis for a vector space and vector subspace, orthonormal basis of vectors. • Explain the underlying concepts behind eigenvector and eigenvalue. • Describe the effects of applying matrix transformations.				
Prerequisites	None	Co-requisites	None		
Course Content	Systems of Linear Equations and Matrices: Introduction to Systems of Linear Equations; Gaussian Elimination; Homogeneous Systems of Linear Equations; Matrices and Matrix Operations; Rules of Matrix Arithmetic; Elementary Matrices and a Method for Finding A-1; Further Results on Systems of Equations and Invertibility. Determinants:				

	The Determinant Function; Evaluating Determinants by Row Reduction; Properties of the Determinant Function; Cofactor Expansion; Cramer's Rule. Vectors in 2-Space and 3-Space: Introduction to Vectors (Geometric); Norm of a Vector; Vector Arithmetic; Dot Product; Projections; Cross Product; Lines and Planes in 3-space. Vector Spaces: Euclidean n-Space; General Vector Spaces; Subspaces; Linear Independence; Basis and dimension; Row and Column Space; Rank; Finding Bases; Inner Product Spaces; Length and Angle in Inner Product Spaces; Orthonormal Bases; Gram-Schmidt Process; Coordinates; Change of Basis. Linear Transformations; Properties of Linear Transformations; Kernel and Range; Linear Transformations from Rn to Rm, Geometry of Linear Transformations from R2 to R2; Matrices of Linear Transformations; Equivalence and Similarity. Eigenvalues, Eigenvectors; Diagonalization; Orthogonal Diagonalization; Symmetric Matrices. Recent developments and contemporary issues pertaining to the subject-matter of the course
Teaching Methodology	Face- to- face
Bibliography	Anton, H., ELEMENTARY LINEAR ALGEBRA, Wiley Kolman, B. & Hill D., Elementary Linear Algebra with Applications, Pearson Modern Classics for Advanced Mathematics Series Anton, H., Rorres, C., ELEMENTARY ALGEBRA (Applications Version), Wiley Stoll, R. & Wong., E., LINEAR ALGEBRA, Academic Press Hill Jr., R.G., ELEMENTARY LINEAR ALGEBRA, Academic Press Lay, D., Lay, R. & McDonald, J., Linear Algebra and its Applications, Pearson

Assessment	Examinations	90%
	Class Participation and Attendance	10%
		100%
Language	English	

Course Title	Discrete Structures				
Course Code	MAT170				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1st Year / 2nd Semester				
Teacher's Name	Marina Appiou Nikiforou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	Provide students with the necessary mathematical foundations for their subsequent computer science courses. This will extend students' mathematical maturity and ability to deal with abstraction.				
Learning Outcomes	Upon successful completion of the course, students will be able to: • Understand the notion of mathematical thinking, mathematical proofs, and algorithmic thinking, and be able to apply them in problem solving. • Apply formal methods of propositional and predicate logic. • Recall the basic terminology of functions, relations, sets, and graphs and use it to solve problems associated with these. • Recognize the different proof techniques and implement these for a given problem. • Calculate permutations and combinations of a set and discuss the meaning for the specific problem • Understand the basics of generating functions and recurrence relations, and be able to apply the methods from these subjects in problem solving. • Understand basic properties of graphs and related discrete structures, and be able to relate these to practical examples.				
Prerequisites	MAT140	Co-requisites	None		
Course Content	Set Theory: Sets, subset and set operations. Laws of set theory. Venn diagrams. Cartesian product. Power sets. Fundamentals of Logic: Basic connectives and Truth Tables. Logical Equivalence and logical implication. Predicate logic. Modus ponens and modus tollens. The use of quantifiers. Relations: Cartesian product and relations, binary relations. Properties of relations: symmetric, antisymmetric, reflexive, transitive. Inverse and composition of relations. Partial orders and equivalence relations.				

<table>
<tr><td></td><td>Functions: plain, one-to-one and onto. Composition and inverse function.

Proofs: The structure of mathematical proofs; Direct proofs; Proof by counterexample; Proof by contradiction; Mathematical induction; Strong induction; Recursive mathematical definitions; Well orderings.

Counting: General counting methods for arrangements and selections. Permutations and combinations with or without repetition. Binomial theorem; Pascal’s identity. Inclusion-exclusion principle. The Pigeonhole principle.

Recurrence relations, solving recurrences using generating functions.

Graphs: Basic graph properties, representations of Graphs. Paths and cycles, Hamiltonian Cycles and the Traveling Salesperson Problem, the Shortest-Path problem and algorithm. Isomorphisms of Graphs. Planar Graphs, Problem-Solving using Graphs

Recent developments and contemporary issues pertaining to the subject matter of the course.</td></tr>
<tr><td>Teaching Methodology</td><td>Face- to- face</td></tr>
<tr><td>Bibliography</td><td>Richard Johnsonbaugh, DISCRETE MATHEMATICS, Pearson (Latest edition)

Kenneth H Rosen Discrete Mathematics and Its Applications McGraw-Hill (Latest edition)

Susanna S. Epp, DISCRETE MATHEMATICS WITH APPLICATIONS, Brooks/Cole (Latest edition)

Chartrand G., Zhang P., DISCRETE MATHEMATICS, Waveland Pr. Inc. (Latest edition)</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>75%</td></tr><tr><td>Assignments/Lab</td><td>15%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Calculus II				
Course Code	MAT200				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	2nd Year / 3rd Semester				
Teacher's Name	Demetris Hadjiloucas				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course, as a continuation of CALCULUS I, provides a good working knowledge of calculus, a powerful mathematical instrument in engineering and science.				
Learning Outcomes	Upon successful completion of the course, students will be able to: • Manipulate definite integrals to calculate the area between curves, the volume of a solid by revolution, the arc length, surface area and center of mass • Compute the inverse, the derivative and the integral of logarithmic, exponential, and trigonometric functions • Implement a variety of integrating techniques, including integration by parts, algebraic or trigonometric substitution, and partial fractions • Distinguish and evaluate improper integrals • Evaluate definite integrals using numerical approximations • Recognize different sequences whether they converge or not • Use series tests such as geometric, telescoping, integral, ratio, and root to determine the convergence or divergence of different series				
Prerequisites	MAT150	Co-requisites	None		
Course Content	Volumes by Slicing and Rotation About an Axis: The Disk and Shell Method. Lengths of Plane Curves. Moments and Centers of Mass. Areas of Surfaces of Revolution. Review of Inverse Functions. Continuity and Differentiability of Inverse Functions. Differentiation and Integration of Exponential and Logarithmic Functions. Integration of Trigonometric Functions. The Inverse Trigonometric Functions.				

	Review of the Basic Formulas of Integration. Integration by Parts. Integration of Rational Functions by Partial Fractions. Integrals of Certain Trigonometric Functions. Integrals Involving Trigonometric Substitutions. Numerical Integration. Trapezoidal Rule. Error Bound for Trapezoidal Rule. Simpson's Rule. Error Bound for Simpson's Rule. Improper Integrals. Sequences of Real Numbers. Finite and Infinite. Limit of a Sequence Convergence and Divergence of a Sequence. Bounded and Monotonic Sequences. Geometric Series. Convergence and Divergence of a Geometric Series. Infinite Series. The Ratio and Root Tests. Power Series. Convergence and Divergence of a Power Series. Taylor and MacLaurin Series. Taylor Polynomials. Approximation Using Taylor Polynomials. Recent developments and contemporary issues pertaining to the subject matter of the course
Teaching Methodology	Face- to- face
Bibliography	Weir/Hass/Giordano., THOMAS' CALCULUS, Pearson/Addison Wesley (Latest edition) Stewart J, SINGLE VARIABLE CALCULUS, Thomson Brooks/Cole (Latest Edition) Anton, H., CALCULUS WITH ANALYTIC GEOMETRY, Wiley (Latest edition) Adams R., Essex C., CALCULUS: A complete course, Pearson (Latest edition) Morris C., Stark R., FUNDAMENTALS OF CALCULUS, Wiley (Latest edition)
Assessment	Examinations 90% Class Participation and Attendance 10% 100%
Language	English

Course Title	Differential Equations				
Course Code	MAT210				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 7th Semester				
Teacher's Name	Evangelos Papaefthymiou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The purpose of the course is to provide the student the skills and working knowledge on differential equations. The student will appreciate the role of differential equations as tools for modeling and studying phenomena in fields like science, engineering, economics. The student will also develop the skills for solving a variety of linear and non-linear ordinary differential equations.				
Learning Outcomes	Upon successful completion of this course students should be able to: • Define what ordinary differential equations are and classify them. • Solve a large variety of ordinary differential equations including linear differential equations (emphasis on first- and second-order linear), separable, homogeneous as well as differential equations reducible to the previous forms. • Appraise the power of differential equations as tools for modelling and solving problems from the fields of Natural Sciences, Engineering as well as Economics. • Identify the concept of a Laplace transform and use it to solve linear differential equations as well as systems of linear differential equations. • Identify the concept of a Power Series and use it in solving Differential Equations. • Define what partial differential equations are and solve them using characteristic lines or separation of variables.				
Prerequisites	MAT200	Co-requisites	None		
Course Content	Introduction: Definition of key terms: ordinary differential equations, order of a differential equation, explicit solution and implicit solution over an open interval, initial conditions, initial-value problem, linear differential equation, non-linear differential equation.				

First-Order Linear Differential Equations:
Solution using the method of integrating factors. Solution of differential equations reducible to first order linear ones by means of an appropriate substitution: Bernoulli's equation, Ricatti's equation, Higher-Order linear differential equations. Applications of First-Order Linear Differential Equations: Radio-carbon dating technique, population growth model, charging/discharging of a capacitor, logistic equation.

Separable Differential equations:
Solution and applications of separable differential equations: Speed of a chemical reaction, motion of a particle under a resistive force.

Homogeneous Differential equations:
Solution of homogeneous and equations reducible to homogeneous equations.

Second-Order Linear Differential Equations:
Basic theorems. Solution of homogeneous second-order linear differential equations with constant coefficients using the auxiliary equation. Applications: Simple Harmonic Motion (free, underdamped, critically damped, overdamped),

Current in an LCR circuit.

Solution of non-homogeneous second-order linear differential equations with constant coefficients with RHS being a polynomial, an exponential, of the form asinkx + bcoskx and a linear combination or product of the previous forms. Applications: Forced oscillations with emphasis on resonance.

Solution of homogeneous second order linear differential equations by the method of reduction of order when one solution is known. Solution of nonhomogeneous second order linear differential equations with constant coefficients by the method of variation of parameters.

Laplace Transforms:
Definition of the Laplace Transform and calculation in simple cases. Elementary Properties and Theorems of the Laplace Transform. Inverse Laplace Transforms and calculations of these using standard tables. Solution of Linear Differential Equations and simple systems of Linear Differential Equations using Laplace Transforms.

Series Solutions of Differential Equations:
Power Series. Radius and interval of convergence. Taylor Series. Series solutions of linear differential equations about ordinary points and about regular singular points.

Partial Differential Equations:

	First Order PDE in two variables. Solutions by using characteristic lines and by a change of variables.
Teaching Methodology	Face- to- face
Bibliography	Zill D., A FIRST COURSE IN DIFFERENTIAL EQUATIONS WITH MODELING APPLICATIONS, Brooks/Cole Cengage Learning Nagle, K., Saff E., Snider A., FUNDAMENTALS OF DIFFERENTIAL EQUATIONS, Pearson Simmons G., DIFFERENTIAL EQUATIONS WITH APPLICATIONS AND HISTORICAL NOTES, Chapman and Hall/CRC Boyce W., DiPrima R., Meade D., ELEMENTARY DIFFERENTIAL EQUATIONS AND BOUNDARY VALUE PROBLEMS, Wiley Butcher J., NUMERICAL METHODS FOR ORDINARY DIFFERENTIAL EQUATIONS, Wiley
Assessment	Examinations 90% Class Participation and Attendance 10% 100%
Language	English

Course Title	Probability and Statistics				
Course Code	MAT225				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	3rd Year / 1st Semester				
Teacher's Name	Demetris Hadjiloucas				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course provides the engineer a good knowledge of applications of statistics and probability theory. Modelling real life problems using probability models as well as presenting ways of processing and analyzing data using statistical techniques are central to this course.				
Learning Outcomes	• Appropriately use tabular and graphical methods of analyzing and presenting qualitative and quantitative data • Construct, interpret, and use numerical measures of location and variability for the sample and the population • Apply basic probability concepts in decision-making • Describe the properties of the Binomial, Poisson and Normal distributions, and apply the concepts of expected value and variance of a probability distribution to a variety of business applications • Construct and interpret interval estimates for a population mean and proportion • Calculate and interpret statistical decisions from hypothesis testing for the mean and proportion of one population • Use Markov Chain techniques to model and further analyze problems				
Prerequisites	MAT160, MAT200	Co-requisites	None		
Course Content	Graphical Representation of Data: Bar Chart, Histogram, Frequency Polygon. Statistical Measures: Measures of Central Tendency (Mean, Median, Mode), Measures of Variability (Standard Deviation, Variance, Range).				

	Probability: Sample Space, Event, Probability of an Event, Laws of Probability, Conditional Probability, Bayes' Theorem. Counting Methods: Permutations, Combinations, Relations between Permutations and Combinations, Applications. Random Variables: Concept of a Random Variable, Expectation, Variance, Discrete Probability Distributions (Binomial Distribution, Poisson Distribution), Continuous Probability Distributions (Uniform Distribution, Normal Distribution). Markov Chains: Transition function, Transition Matrix (for Markov Chains with Finite Number of States), Stationary Distributions, Steady State Distributions. Confidence Intervals: Point Estimation of the Mean, Confidence Intervals for the Population Mean for Large Samples, Confidence Intervals for the Population Mean for Small Samples, t-distribution, Confidence Intervals for Proportions. Hypothesis Testing: Hypothesis Testing for the Mean of One Population for Large and Small Samples, The Null and Alternative Hypothesis, The t-test, Degrees of Freedom, Applications.
Teaching Methodology	Face – to – face
Bibliography	Johnson, R.A., PROBABILITY AND STATISTICS FOR ENGINEERS, Prentice Hall (latest edition) Hoel P.G., Port S.C., Stone C.J., INTRODUCTION TO STOCHASTIC PROCESSES, Houghton Mifflin Company (latest edition) Volk, W., APPLIED STATISTICS FOR ENGINEERS, McGraw Hill (latest edition) Walpole, R.E. & Mayers R.H., PROBABILITY AND STATISTICS FOR ENGINEERS AND SCIENTISTS, Macmillan (latest edition) Strait, P., PROBABILITY AND STATISTICS WITH APPLICATIONS, Harcourt Brace Juvanovich (latest edition) De Groot, M.H., PROBABILITY AND STATISTICS, Wesley (latest edition) Bain, L.T. & Engelhardt, M., PROBABILITY AND MATHEMATICAL STATISTICS, Thomson (latest edition)
Assessment	Examinations 90% Class Participation and Attendance 10% 100%
Language	English

Course Title	Programming Principles I – Robotics Lab				
Course Code	CSE100				
Course Type	Compulsory				
Level	Bachelor (1st cycle)				
Year / Semester	1st Year / 1st Semester				
Teacher's Name	Pericles Leng Cheng				
ECTS	6	Lectures / week	3 hours/ 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course aims to provide theoretical as well as practical experience to students that are now starting out in programming. The course will introduce the basic ideas of problem solving and programming, using the principles of top-down design, stepwise refinement, and procedural abstraction. The students get practical experience with a structured programming language along with its use in the construction and execution of complete programs that solve simple algorithmic problems. Basic data types, input/output conventions, selection and iteration structures are presented. There will be an emphasis on practical training on robotics platforms that will help students understand the concepts.				
Learning Outcomes	Upon succesful completion of this course students should be able to: • Write, compile and run programs in a structured programming language • Apply decision/control code structures in order to control program execution and flow • Use repetition code structures to perform long-winded calculation and manipulation of output • Create and use arrays in order to store and manipulate collections of related data • Create and use methods/functions in order to modularize larger programs and reduce complexity • Declare and manipulate pointers as the basis of dynamic memory manipulation • Apply knowledge learned in solving problems using robotic platforms				
Prerequisites	None		Co-requisites		CSE105 (for CSE students only)
Course Content	**Theoretical part**				

	Introduction to programming and understanding where programming 'fits' in the software development process and computer science in general. Basic familiarization with the software development platform. Declaring and initializing variables and constants. Declaring basic data types variable and manipulating their values. Basic input (obtaining input from the user) and output (showing some result to the user). Learning how to use control structures to manipulate the execution of the program. Using <if> and <if/else> and <switch> constructs in order to control how a program behaves. Understanding iteration and how to use repetition structures to enable automatic execution of multiple times. Using <for>, <while> and <do/while> constructs to program recurring instances of code and repeating through certain functionalities. Implementing and using advanced data structures such as arrays, as a means of collectively referring to sets of related data. Using <for> and enhanced <for> loops to go through arrays and perform actions and calculations. Creating and using methods (or functions) as a means for modular program design and as a tool for reducing complexity for when working with bigger problems. Learn and use to pass and return arguments. Brief introduction to pointers with a basis on memory allocation, memory addressing and memory access. Passing information to functions using by reference or by value capabilities. **Laboratory part** Utilizing robotics practical sessions throughout the course using the knowledge gained in previous weeks to design modular solutions for robot manipulation. Hands-on sessions will be held every two to three weeks and will allow students to develop code to control a robotic platform. The robots can be mobile allowing movement control, or stationary allowing sensor input and the display of values on displays. Sensor input code, actuator output code, display configuration and use. Use of variables for control values, array structures for sensor input, development of functions for specific parts of the robotic solution.
Teaching Methodology	Face – to – face
Bibliography	“C How to Program, Global Edition” by Paul Deitel

	“C Programming for Arduino” by Julien Bayle “Beginning C for Arduino: Learn C Programming for the Arduino” by Jack Purdum “Learning C for Arduino” by Syed Omar Faruk Towaha
Assessment	Examinations 60% Class Participation and Attendance 10% Assignments 30% 100%
Language	English

Course Title	Programming Principles II - Robotics lab				
Course Code	CSE120				
Course Type	Compulsory				
Level	Bachelor (1st cycle)				
Year / Semester	1st Year / 2nd Semester				
Teacher's Name	Andreas Grondoudis				
ECTS	6	Lectures / week	3 hours/ 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The purpose of this course is to introduce basic principles of object orientation and have the students develop an understanding of concepts and ideas relating to object orientation. An objective of the course is to have student create and learn to use classes in order to solve problems by applying the object orientation paradigm. Another objective is to have the student learn to use a high-level object-oriented programming language as a means to providing solutions. Another objective of the course is to increase the programming experience of the students and reinforce their knowledge of a basic computer science skill.				
Learning Outcomes	Upon successful completion of this course students should be able to: • specify new classes and provide the basic building blocks (constructors functions, get functions, set functions etc.) • create objects of specified classes and use them to design and implement solutions to scenario-based problems • use inheritance and implement hierarchies of classes and dynamic object orientated features • work with string and string manipulation functions • write to and read from files • apply error checking techniques • depending on the programming language used: • declare and use pointers and/or • create abstract classes and interfaces and/or • create basic graphical user interfaces and handle events and/or • specify and use operator overloading				
Prerequisites	CSE100		Co-requisites	None	
Course Content	**Theoretical part**				

	Classes and objects Introduction to classes and object-oriented design; creating classes; preprocessor directives and integrating classes in the native language environment; private, protected and public access; writing constructors (overloading constructors or providing default argument constructors); access (set & get) functions; static class members; constant class members; data abstraction and encapsulation. Printing or outputting objects Creating objects; using objects Object creation, arrays of objects, objects as arguments to functions, objects as return values form functions, pointers to objects, object references; using objects as data attributes of other classes (class composition); writing additional class functions and defining additional object behaviors. Inheritance and polymorphism The concept of inheritance and building classes based on (or inheriting form) other, existing, classes. Understanding code reusability and applying it in creating new classes based on existing ones. Depending on the programming language used: ▪ Base classes and derived classes or super classes and subclasses ▪ Abstract classes or virtual classes ▪ Interfaces or multiple inheritance ▪ Polymorphism and dynamic binding Exceptions and exception handling Errors, types of errors, error checking approaches; error handling approaches; the notion of exception and what it means to either throw one or catch one. securing programs to ensure correct and uninterrupted program execution. Strings and string manipulation Usual data types; using strings; manipulating strings, comparing, changing, truncating, concatenating strings. Files: Temporary vs permanent storage, what is a file; types of files; saving data onto files and retrieving data from files. Ready-made (programming language-specific) functions to output data to files or input data from files. Writing data as text or as binary. Depending on the programming language used: ▪ Friend functions and Friend classes and/or ▪ Operator overloading and/or ▪ Graphical user interface; GUI components; building GUI applications and/or ▪ Event handling, inner classes

	Laboratory part Laboratories will be delivered every two to three weeks and will allow students to practice the concepts learned in theory on a real robotic platform. Students will learn how to use Object Orientation, learn how to develop libraries to be used in different projects and how to use build in libraries in the development of programs using C++.
Teaching Methodology	Face-to-face
Bibliography	Deitel P., Deitel H., C++ How to program: Late objects, Latest edition, Pearson Deitel P., Deitel H., Java How to program: Late objects, Latest Edition, Pearson Savitch W., Mock K., Absolute C++, Latest Edition, Pearson Savitch W., Mock K., Absolute Java, Latest Edition, Pearson Stroustrup B., Programming: Principles and practice using C++, Latest Edition, Addison-Wesley Professional Sedgewick R., Wayne K., Introduction to programming in java: An Interdisciplinary approach, Latest Edition, Addison-Wesley Professional Syed Omar Faruk Towaha, Learning C for Arduino, Latest Edition, Packt Publishing
Assessment	Class Participation and Attendance 10% Assignments 30% Examinations 60% 100%
Language	English

Course Title	Data Structures and Algorithms				
Course Code	CSE200				
Course Type	Compulsory				
Level	Bachelor (1st cycle)				
Year / Semester	2nd Year / 3rd Semester				
Teacher's Name	George Christou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The course will introduce students to the basic concepts of data structures, and their usefulness in various computer operations. Structures like arrays, stacks, queues, linked lists, trees and graphs will be discussed and analyzed. Algorithms will be developed that operate and manipulate these structures efficiently. Analysis of time-space complexity of algorithms.				
Learning Outcomes	Upon succesful completion of this course students should be able to: • Analyze program time complexity and express it in big-Oh, Omega and Theta notation. • Classify and evaluate different data structures, both linear and non-linear. • Develop programs that use dynamic linear and non-linear data structures to solve specific problems. • Generate programs that use abstract data structures to solve computational problems. • Apply different algorithms to solve computational problems.				
Prerequisites	CSE120, MAT170 (for BCSC and BECE students), CSE120 (for BCIS students)	Co-requisites	None		
Course Content	Introduction and basic concepts of data structures: Definition of a data struc¬ture, implementation of a data structure, definition of an algorithm, distinguishing between an algorithm and a program, how to create and analyze programs. Asymptotic notation and arithmetic, O-notation. Complexity of searching and sorting algorithms. Recursive mathematical function, recursively defined problem, relation of mathematical induction and recursion, comparison of iterative and recursive solutions, divide-and-conquer strategies, recursive backtracking.				

	Linked Lists: Cursor-implementation of a linked list, pointer implementation of a Linked list, the INSERT and DELETE operations on Linked lists, the efficiency of these opera¬tions on Linked lists compared to sequential storage structures, algorithms for Deletion and Addition with Linked lists; doubly linked lists and their advantages versus singly linked lists. STACKS and QUEUES: Definitions of these two data structures, operations associa¬ted with stacks, CREATE a stack DELETE a stack, return the TOP element of a stack, ADD an element to the stack algorithms for ADDING to and DELETING elements from a stack; operations performed on Queues, Create a queue, DELETE the FRONT element of a queue, ADD an element to the REAR of a queue, algorithms for Deletion and Addition routines on Queues. Sorting and Searching: O(n2) and O(nlogn) sorting techniques, Linear and Binary Search, Greedy and Divide and Conquer algorithmic techniques, Hashing. Trees: Definition of a Tree, a rooted tree, the height of a rooted tree, level numbers of any vertex, a balanced tree, theorems concerning¬ a Tree graph, an n-ary tree, traversing a tree, Inorder, Postorder Preorder and Level-Order traversals; implementation of trees, representation of trees by Lists of children using linked lists; BINARY trees, representing binary trees Advanced set representation methods: definition of a SET BINARY SEARCH Trees, the Binary Search Tree property, operations supported by such structures (INSERT, DELETE, MEMBER, MIN) algorithms to implement these operations, time-analysis of these operations; INSERTION into a BALANCED Tree, DELETION in a Balanced Tree Graph Theory: What a graph, what a PATH and a CIRCUIT are, directed and undirected graphs, networks, breadth- and depth-first search in graphs, representation of graphs as abstract data structures. Recent developments and contemporary issues pertaining to the subject-matter of the course.
Teaching Methodology	Face-to-face
Bibliography	Dale, N., Weems, C and Richards, T. (2016) C++ Plus Data Structures, Jones and Bartlett Publishing Weiss, M. A. (2016) Data structures and algorithm analysis in C++, Pearson.

	Goodrich, M. T. and Tamasia R. (2011) Data Structures and Algorithms in C++. Wiley. Wengrow, J. (2017). A Common-Sense Guide to Data Structures and Algorithms: Level Up Your Core Programming Skills, Pragmatic Bookshelf.
Assessment	Examinations 70% Class Participation and Attendance 10% Assignments 20% 100%
Language	English

<table>
<tr><td>Course Title</td><td colspan="5">Data Communications and Computer Networks</td></tr>
<tr><td>Course Code</td><td colspan="5">CSE300</td></tr>
<tr><td>Course Type</td><td colspan="5">Compulsory</td></tr>
<tr><td>Level</td><td colspan="5">Bachelor (1st Cycle)</td></tr>
<tr><td>Year / Semester</td><td colspan="5">3rd Year / 5th Semester</td></tr>
<tr><td>Teacher’s Name</td><td colspan="5">Katerina Papanikolaou</td></tr>
<tr><td>ECTS</td><td>6</td><td>Lectures / week</td><td>3 hours/ 14 weeks</td><td>Laboratories / week</td><td>N/A</td></tr>
<tr><td>Course Purpose and Objectives</td><td colspan="5">To provide an overview of the broad and constantly emerging field of data communications and computer networks. Data communication is discussed as the necessary tool for understanding computer communication networks.</td></tr>
<tr><td>Learning Outcomes</td><td colspan="5">Upon successful completion of the course, students will be able to:
State and identify concepts relating to data communications; communication protocols and layered protocol architectures
State and interpret protocol communication standards like OSI and TCP/IP as used in computer networking and internetworking.
Recognize and explain data transmission fundamentals and types of media (both wired and wireless)
Define and discuss data link control protocols and their functionality
Recall and explain multiplexing techniques and their applications
Define, explain and exemplify concepts related to Local Area Networks; their topologies and protocols; their types and transmission technologies
Describe the process of routing, appraise different control protocols,
Recognize congestion, examine congestion control methods, value different congestion control methods
Describe, explain and classify types of security attacks; types and algorithms of encryption; security functionality in IP versions 4 and 6
Compare different network designs, develop networks designs for given parameters</td></tr>
<tr><td>Prerequisites</td><td colspan="2">ECE210</td><td>Co-requisites</td><td colspan="2">None</td></tr>
<tr><td>Course Content</td><td colspan="5">Introduction/Revision:</td></tr>
</table>

	Communication systems, entities and components. Computer networks as communication system; their topologies and types. Communication protocols, layered communications and protocols architectures. The OSI and TCP/IP standards; Physical Layer Data communication systems; transmission, impairments and media; Data transmission basics; frequency concepts, bandwidth, spectrum; data rate and bandwidth. Analog and digital transmission; wired transmission impairments. Transmission media and impairments for both wired (UTP, STP, Coaxial, Fiber) and wireless (Microwave, Radio, Infrared). Signal encoding techniques; analog-to-digital (and visa-versa) data-to-signal conversion Communication techniques; Data Link Control; Multiplexing Synchronous & asynchronous transmission, Error control: types, detection and correction. Flow control: Stop-and-wait, Sliding-window, Automatic Repeat Request. The High-level Data Link Control protocol: modes, frame types and operation. Frequency Division Multiplexing, Synchronous and Statistical Time Division Multiplexing, multiplexing applications (ADSL) Local area networks; wired and wireless LAN topologies, protocols and the IEEE 802 standards; LAN interconnection, bridges, hubs, switches. Ethernet versions. Cellular systems: frequency reuse, capacity increase, operation. Wireless LANs: applications/types and transmission technologies Introduction to network routing and congestion control Virtual circuit and datagram networks; Router structure. Routing algorithms; link-state; distance-vector and hierarchical routing. Routing in the Internet (Intra-AS routing and Inter-AS routing: BGP). Broadcast and multicast routing. IPv6. Principles of congestion control; causes and the costs of congestion; approaches to congestion control; TCP congestion control. Network security Requirements; types of attacks; symmetric and asymmetric encryption techniques and their algorithms; Secure Socket Layer; IPv4 and IPv6 security; wireless protected access
Teaching Methodology	Face- to- face
Bibliography	W. Stallings, Computer Networking with Internet Protocols and Technology, Prentice Hall J.F. Kurose and K.W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Addison-Wesley

	Behrouz A. Forouzan Data Communications and Networking, 4/e, Mc Graw-Hill A S. Tanenbaum, Computer Networks, Prentice Hall
Assessment	Examinations 75% Assignments/Lab 15% Class Participation and Attendance 10% 100%
Language	English

Course Title	Operating Systems				
Course Code	CSE320				
Course Type	Compulsory				
Level	Bachelor (1s Cycle)				
Year / Semester	3rd Year / 5th Semester				
Teacher's Name	Pericles Leng Cheng				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course provides the students with a basic understanding of what an operating system is and how it works. The theory illustrates the problems handled by operating systems and concentrates on the applications of this specialized software to a real-world environment. The course follows an embedded laboratory approach, where students are required to utilize a variety of tools during the implementation of lectures for the solution of typical operating systems problems and the development of code for schedulers or page replacement algorithms.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Explain the role and main functionalities of the Operating System. • Describe the various features of processes as well as CPU-scheduling algorithms. • Analyse the critical-section problem and its software and hardware solutions. • Provide a description of deadlocks and methods for preventing or avoiding deadlocks in a computer system. • Describe various memory-management techniques and explain the concepts of a virtual memory system. • Explain the function of file systems, file system design and file system protection. • Describe new trends in operating system design.				
Prerequisites	CSE200, ECE210	Co-requisites	None		
Course Content	Introduction: Overview of an operating system; importance of operating systems; operating systems as resource managers; The need of Operating Systems, what they do and how they are designed. Operating system protection.				

<table>
<tr><td></td><td>Basic system resources: The hardware; an overview; main memory; the central processing unit, the registers; input and output devices; the secondary storage devices; interfaces; control unit; and channels.

Process Management: The process concept and concurrency. Process scheduling, interprocess communication, process synchronization, and deadlock handling. Critical-Section; Problem and solutions (software, semaphores etc). Classical Problems of Synchronization (The Readers and Writers, Dining-Philosophers etc). Deadlock characterization. Methods for handling Deadlocks. Deadlock Prevention. Deadlock Avoidance. The Banker's Algorithm. Deadlock Detection.

Multiprogramming and Time-sharing: Software for multiprogramming and Time-sharing; allocating CPU time; main memory allocations; job scheduling; registers; Input/Output device allocation; control of data resources; secondary storage space management.

Memory Management: Memory allocation and memory management; processor management and priorities; interrupts and the flow of control; input/output device allocation; Segmentation; Paging and Virtual memory; segmentation systems; paging systems; virtual memory; implementing virtual memory.

File Systems: Physical storage of data. File operations (create, write, read, delete). Access methods (sequential, index etc.). Directory Systems (single-level, tree-structured). File Protection.

Trends in Operating system design; case study typical OS (Windows, UNIX, Solaris). Recent developments and contemporary issues pertaining to the subject-matter of the course.</td></tr>
<tr><td>Teaching Methodology</td><td>Face- to- face</td></tr>
<tr><td>Bibliography</td><td>“OPERATING SYSTEM CONCEPTS” by Silberschatz/Galvin, Addison-Wesley

“OPERATING SYSTEMS INTERNALS AND DESIGN PRINCIPLES” by William Stallings, Prentice Hall

“OPERATING SYSTEMS” by Gary Nutt, Addison-Wesley

“OPERATING SYSTEMS-DESIGN AND IMPLEMENTATION” by Andrew Tanenbaum, S., Prentice Hall</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>70%</td></tr><tr><td>Assignments/Lab</td><td>20%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Information Security				
Course Code	CSE405				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 7th Semester				
Teacher's Name	Yianna Danidou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course provides the foundation for understanding the key issues associated with protecting information assets, determining the levels of protection and response to security incidents, and designing a consistent, reasonable information security system, with appropriate intrusion detection and reporting features. The purpose of the course is to provide the student with an overview of the field of information security and assurance. Students will be exposed to the spectrum of security activities, methods, methodologies, and procedures. Coverage will include inspection and protection of information assets, detection of and reaction to threats to information assets, and examination of pre- and post-incident procedures, technical and managerial responses, and an overview of the information security planning and staffing functions. Specific topic coverage includes: Introduction to Information Security • The Need for Security • Legal, Ethical, and Professional Issues in Information Security • Planning for Security • Risk Management • Security Technology: Access Controls, Firewalls, and VPNs • Security Technology: Intrusion Detection and Prevention Systems and Other Security Tools • Cryptography • Physical Security • Implementing Information Security • Security and Personnel • Information Security Maintenance				
Learning Outcomes	Upon successful completion of the course, students will be able to: • define information security, risk management, risk identification, risk mitigation strategy options and risk control, basic principles of				

<table>
<tr><td></td><td colspan="3">cryptography, physical security considerations, digital forensics and other critical concepts of information security
• enumerate the phases of the security systems development life cycle
• describe the issues facing software developers, as well as the most common errors made by developers, and explain how software development programs can create software that is more secure
• assess risk based on probability of occurrence and likely impact
• analyze a security incidents and design countermeasures.
• explain the mechanism to protect confidentiality and completeness of data.
• list and define the major categories of scanning and analysis tools, and describe the specific tools used within each of these categories</td></tr>
<tr><td>Prerequisites</td><td>CSE300 OR MAT205</td><td>Co-requisites</td><td>None</td></tr>
<tr><td>Course Content</td><td colspan="3"><u>Introduction to Information Security:</u> the history of information security; what is security; CNSS security model; components of an information system; balancing information security and access; approaches to information security implementation; the systems development life cycle; the security systems development life cycle; security professionals and the organization; communities of interest; information security: is it an art of a science?

<u>The Need for Security</u>: business needs first, threats, attacks, secure software development.

<u>Legal, Ethical, and Professional Issues in Information Security</u>: law and ethics in information security, relevant US laws, international laws and legal bodies, ethics and information security, codes of ethics and professional organisations.

<u>Planning for Security</u>: an overview of risk management, risk identification, risk assessment, risk control strategies, selecting a risk control strategy, quantitative versus qualitative risk control practices, risk management discussion points, recommended risk control practices.

<u>Risk Management</u>: information security planning and governance, information security policy, standards and practices, the information security blueprint, security education, training and awareness program, continuity strategies.

<u>Security Technology: Access Controls, Firewalls, and VPNs</u>: access controls, firewalls, protecting remote connections.

<u>Security Technology: Intrusion Detection and Prevention Systems and Other Security Tools</u>: intrusion detection and prevention systems, honeypots, honeynets, and padded cell systems, scanning and analysis tools, biometric access controls.</td></tr>
</table>

	Cryptography: foundations of cryptology, cipher methods, cryptographic algorithms, cryptographic tools, protocols for secure communications, attacks on cryptosystems. Physical Security: physical access controls, fire security and safety, failure of supporting utilities and structural collapse, interception of data, mobile and portable systems, special considerations for physical security. Implementing Information Security: information security project management, technical aspects of implementation, nontechnical aspects of implementation, information systems security certification and accreditation. Security and Personnel: positioning and staffing the security function, credentials of information security professionals, employment policies and practices, secure considerations for nonemployees, internal control strategies, privacy and the security of personnel data. Information Security Maintenance: security management maintenance models, digital forensics.
Teaching Methodology	Face- to- face
Bibliography	Michael E. Whitman, Mattord, Principles of Information Security, Cengage Charles P. Pfleeger, Shari Lawrence Pfleeger, Jonathan Margulies, Security in Computing, Pearson Mark S. Merkow, Jim Breithaupt, Information Security: Principles and Practices, Pearson William (Chuck) Easttom, II, Computer Security Fundamentals, Pearson Umesh Hodeghatta Rao, Umesha Nayak, The InfoSec handbook – an introduction to information security.
Assessment	Examinations 70% Assignments/Lab 20% Class Participation and Attendance 10% 100%
Language	English

Course Title	Problem-Solving Fundamentals and Measurements				
Course Code	ECE105				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1st Year / 1st Semester				
Teacher's Name	Pericles Leng Cheng				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to provide students with the necessary problem-solving skills that are one of the key skills required by computer scientists and engineers to learn programming. Students will learn how to solve a problem by defining the problem, identifying possible solution alternatives, implementing a solution, evaluating the solution and finally troubleshooting the solution. The course follows an embedded laboratory approach, where students are required to utilize a variety of tools for the development of the solutions.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Identify a real problem and define it in a correct way • Describe the various problem-solving characteristics and skills required by a scientist or engineer • Describe and utilize appropriate tools & techniques available to clearly define real problems • Explain and utilize creative skills such as brainstorming, vertical and lateral thinking, cross-fertilization and incubation of ideas • Describe and apply the implementation process of a solution for a problem • Evaluate solutions based on the expected solution • Explain and apply the troubleshooting process for any issues in the implemented solution				
Prerequisites	None	Co-requisites	None		
Course Content	Problem-Solving Strategies: Understanding what the real problem is and formulating a correct problem definition avoiding the development of a wrong solution. Following a heuristic for successful problem-solving. Problem-Solving characteristics and skills: Learning how to work effectively in teams to solve a problem. Identifying problems in group				

<table>
<tr><td></td><td>work such as criticism and resolving conflicts. Developing critical thinking skills necessary for problem-solving.

Techniques: Using Duncker diagrams to define real problems. Using Statement-Restatement techniques. Using the Kepner-Tregoe Problem analysis technique. Brainstorming and identifying solution alternatives.

Generating solutions: Improving creative abilities, identifying risk and reward, brainstorming, vertical thinking, lateral thinking. Organizing ideas, Brainwriting, Futuring, Cross-Fertilization, Analogies, Incubating ideas.

Implementing solutions: Approval of the proposed solution by the team, carry through, follow up, setting goals.

Solution Evaluation: General evaluation guidelines, Ethical evaluations, safety considerations.

Troubleshooting: General troubleshooting guidelines, technical troubleshooting exercises.</td></tr>
<tr><td>Teaching Methodology</td><td>Face-to-Face

Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.</td></tr>
<tr><td>Bibliography</td><td>“Strategies for Creative Problem Solving”, by H. Scott Fogler, Steven E. LeBlanc and Benjamin Rizzo

“Engineering Problem Solving with C++: International Edition” Delores M. Etter, and Jeanine A. Ingber

“Engineering Problem Solving with C: International Edition” by Delores M. Etter

“Computer Architecture: A Quantitative Approach” by John L. Hennessy

“Digital Design and Computer Architecture” by David Harris and Sarah Harris</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>60%</td></tr><tr><td>Assignments/Lab</td><td>30%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Digital Systems I				
Course Code	ECE200				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	2nd Year / 3rd Semester				
Teacher's Name	Christos Dimopoulos				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to provide a comprehensive introduction to the fundamental axioms, theories and conventions underlying the operation of digital systems, and to equip students with the necessary skills which will allow them to analyse, design, test, and simulate the operation of basic digital circuits. The course follows an embedded laboratory approach, where students are required to utilize a variety of digital logic design and simulation tools during the implementation of lectures.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Identify a digital system and its main characteristics, and differentiate between digital and analogue systems • Describe the concepts of binary numbers and binary encoding, and perform conversions between binary, decimal, and hex numbers and between binary codes • Perform basic mathematical operations using binary numbers, and design digital systems capable of performing such operations. • Describe theorems and axioms of Boolean Algebra, and utilize them effectively in the process of designing digital systems • Model, analyse, design, test, and simulate the operation of combinational and sequential circuits using analytic and modular methodologies and tools • Explain the concept of memory in digital systems, and design basic memory modules				
Prerequisites	ECE105 or CSE105	Co-requisites	None		
Course Content	History and Overview: History, overview and applications of digital systems, digital signals and analogue signals, basic concept of a digital system and its main characteristics, electrical representation of binary states, implementation of digital systems through digital logic circuits, advantages and disadvantages of using digital systems, interface between digital and analogue systems.				

	Number Systems and Encoding: The binary number system, binary counting, the hexadecimal number system, integer and fixed-point conversions between binary, hexadecimal and decimal numbers, utilization of binary quantities, binary encoding schemes, encoding and decoding using BCD, Grey, ASCII and Unicode binary codes. Boolean Algebra fundamentals: Axiomatic definition of Boolean algebra, the AND, OR, NOT logic operations, representation of Boolean operations using logic gates. Logic gate characteristics, IEEE / ANSI standards and conventions, derived Boolean algebra operations (NAND, NOR, XOR, XNOR), implementation and conversion between standardized Boolean function expression forms and conventions, description and effective utilization of Boolean algebra theorems, DeMorgan's Theorem. Logic Circuits: Mathematical modelling of logic circuits using Boolean functions and truth tables, implementation of logic circuit from given Boolean function expression (logic circuit design), derivation of Boolean function from given logic circuit (logic circuit analysis), derivation of truth table from given logic circuit (simulation) Hardware Description Language: Introduction to Hardware Description Language (HDL), necessity of using HDL in modern digital systems design, standard HDLs (VHDL / Verilog), description of the logic synthesis process using HDLs, modelling logic circuits using HDL. Combinational Circuit Design: Basic definition of combinational circuits, description and implementation of the analytic process followed for the design of generic combinational circuits, optimisation of combinational circuits using the Boolean function manipulation methodology and the Karnaugh Map methodology (2, 3, and 4-variable cases), combinational circuit design examples. Integrated Circuits: Description of an Integrated Circuit (IC), history and types of ICs, the TTL and CMOS logic families, technical characteristics of ICs. Digital Arithmetic: Signed and unsigned binary numbers, representing signed binary numbers using the 2's complement method, performing basic mathematical operations using binary numbers (addition, subtraction, multiplication, division), analytic design of adder circuits, modular design of adder circuits, carry-look ahead circuit, subtractor circuit, magnitude comparator circuit, precision and overflow issues. Standardized Logic Circuits: Description and design of standardised circuits such as decoders / encoders, multiplexers / demultiplexers, code converters, magnitude comparators and digital displays. Use of standardised logic circuits as building blocks for modular design purposes. Sequential Circuit Design: Introduction to circuits with memory, sequential circuits as a special type of circuits with memory, clocked operation of circuits, description and operation of basic latches (D, SR) and flip-flops (D, JK, T), propagation delay, setup time, and hold

<table>
<tr><td></td><td>time in latches and flip-flops. Fundamental applications of circuits with memory, including serial registers, parallel register, shift registers, asynchronous (ripple) counters and synchronous counters. The synchronous counter design process.

Memory: Introduction to digital memory terminology, basic operation of a memory, RAM memory and types (SRAM and DRAM), ROM memory and types.</td></tr>
<tr><td>Teaching Methodology</td><td>Face- to- face

Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.</td></tr>
<tr><td>Bibliography</td><td>“Digital Systems: Principles & Applications” by Ronald J. Tocci, Neal S. Widmer, and Greg Moss

“Digital Design: With an Introduction to the Verilog HDL, VHDL, and SystemVerilog” by M. Morris R. Mano, and Michael D. Ciletti

“Fundamentals of Digital Logic with VHDL Design”, by Stephen Brown and Zvonko Vranesic

“Digital Fundamentals”, by Thomas L. Floyd

“Digital Logic Design”, by B. Holdsworth</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>70%</td></tr><tr><td>Assignments/Lab</td><td>20%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Circuits and Electronics I				
Course Code	ECE205				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1st Year / 2nd Semester				
Teacher's Name	Leonidas Koufopavlou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course introduces students to designing and analyzing elementary DC Electric Circuits. The resistor, capacitor and inductor and their behavior in DC / AC circuits is studied. The basic principles and the analysis methods of DC and AC circuits are presented. By the end of the course, students should have the necessary background required for designing analogue filters, studying Electronics.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Discuss purpose and role of circuits and electronics in engineering, including key differences between analog and digital circuits, their implementations, and methods of approximating digital behavior with analog systems • Use units of measurement, and describe electric charge and the basic electrical quantities • Use circuit laws related with resistors, inductors and capacitors and describe circuit topologies and use systematic circuit analysis techniques such as mesh/nodal methods. • Analyze and design DC circuits transient circuits containing resistors, capacitors and inductors and apply basic network theorems • Describe the characteristics of sinusoidal AC voltages / currents and the response of basic circuit elements in AC circuits and analyze AC circuits and calculate the various forms of power. • Design and analyze series and parallel resonant circuits and various types of analogue filters				
Prerequisites	MAT150, PHY110	Required	None		
Course Content	History and Overview: Electronics engineering uses or benefits from electronic devices and circuits. Contributors to circuits and electronics and their achievements to this knowledge area. Key differences between analog and digital systems, their implementations, and methods for approximating digital behaviour with analog systems. What is an electric circuit, basic components, Units of measurements (SI				

	units), Powers of ten, conversions between and within systems of units. Current and Voltage: Atoms and their structure, Current, Voltage, Conductors and Insulators. Resistance: Resistance of circular wires, temperature effects, resistor types, conductance, variable resistors, Ohm's law, power, energy, efficiency. Series circuits, voltage sources in series, Kirchhoff's voltage law, voltage divider, parallel circuits, Kirchhoff's current law, current divider, voltage sources in parallel, open and short circuits, Series parallel networks, ladder networks. Capacitors: Electric field, capacitance, dielectric strength, leakage current, capacitor types, charging/discharging a capacitor, transient analysis, time constant, capacitors in series and in parallel, energy stored in a capacitor. Inductor: Time constant, inductor in series and in parallel, energy stored in an inductor, resistive-inductive-capacitive networks with DC inputs. Methods of Circuit Analysis and Network Theorems: Overview of analysis methods for DC electric circuits and basic network theorems. Current sources, current sources in parallel, Branch current analysis, Mesh analysis, Nodal analysis, Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem. Sine Waves: Sinusoidal AC voltage characteristics and definitions - frequency, period, cycle, amplitude, average and effective value. General format for sinusoidal voltage and current, phase shifting. Basic electric elements in AC circuits: Response of basic resistive, capacitive and inductive circuits to a sinusoidal voltage or current, frequency response of the basic elements, Average power, Apparent power, Reactive power, the power triangle, power factor. Series and Parallel AC circuits: Impedance and the phasor diagram, series circuits, voltage divider, frequency response of the R-C circuit, admittance and susceptance, parallel ac networks, current divider rule, frequency response of parallel R-L network, analysis methods for series/parallel ac circuits, equivalent circuits. Mesh/Nodal analysis,

<table>
<tr><td></td><td>bridge networks, superposition theorem, Thevenin’s theorem and Norton’s theorem.

Resonance and Analogue filters:
Series resonance circuits, the quality factor, selectivity, decibels, filters, R-C low/high pass filters, pass band filters, stop band filters, Bode plots.</td></tr>
<tr><td>Teaching Methodology</td><td>Face-to-face

Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.</td></tr>
<tr><td>Bibliography</td><td>J.W.Nilsson & S.A.Riedel , Electric Circuits, Prentice Hall

Robert L. Boylestad, Introductory Circuit Analysis, Prentice Hall International

Hubert, Electric Circuits AC/DC, McGraw Hill</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>55%</td></tr><tr><td>Assignments/Lab</td><td>35%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Computer Organization & Architecture				
Course Code	ECE210				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	2nd Year / 4th Semester				
Teacher's Name	Christos Dimopoulos				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to provide a comprehensive introduction to the fundamental concepts of computer organization and computer architecture, and to equip students with the necessary skills which will allow them to understand the operation of a modern Central Processing Unit (CPU) and measure its performance. Additionally, the course will allow students to understand the trade-offs during the design of a modern computer system. The course follows an embedded laboratory approach, where students are required to utilize CPU simulation tools during the implementation of lectures.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Describe the concepts of computer organization and computer architecture and be able to differentiate between them • Describe the Von Neumann architecture and explain the operation of the fetch-decode-execute cycle • Explain how hardware parts interact in a typical CPU in order to execute a computer instruction • Describe the major characteristics of Instruction Set Architectures (ISA), and utilize effectively a typical ISA in order to program the operation of a CPU • Explain how computer memory is organized hierarchically in a modern computer system, and illustrate the implementation methods of cache memory and virtual memory • Describe and explain the operation of the basic types of I/O architectures used in modern computer systems				
Prerequisites	ECE200	Co-requisites	None		
Course Content	Overview and History: Basic concepts of computer architecture and computer organization, differentiation between the concepts of computer architecture and computer organization, main developments and contributors in the history of computer systems. The Computer System: Definition of a computer system, the Central Processing Unit (CPU), main parts of a CPU (Arithmetic Logic Unit,				

	Control Unit, Registers), System Bus, Clock, Main Memory, description and explanation of the Von Neumann architecture as the basis for the implementation of computer systems, limitations of the Von Neumann architecture, the fetch-decode-execute cycle, the Von Neumann bottleneck, representation of a computer as a hierarchical set of computing levels, recent developments in the implementation of computer systems (including Harvard architectures, parallel computers, multicore architectures, embedded systems). Computer Organization: Arithmetic Logic Unit implementation, Control Unit implementation, hardware implementation of the Control Unit's decoding circuit, software (microprogrammed) implementation of the Control Unit's decoding circuit, trade-offs between hardware and microprogrammed implementation of the Control Unit's decoding circuit. Instruction Set Architectures (ISAs): Basic characteristics and functions of ISAs, design parameters of instructions (including instruction length, variable vs fixed-length instructions, addressing modes, number of operands, and endianness), internal storage (including accumulator, stack, and register-based architectures), types of instructions, Complex Instruction Set Architectures (CISC), Reduced Instruction Set Architectures (RISC), critical comparison between CISC and RISC architectures, modern implementations of CISC and RISC architectures. Assemblers and Assembly Language: Definition of assemblers, operation of assemblers, assembly language, source files and object files, labels, comments, mnemonics, assembly languages versus high-level programming languages, developing small-scale assembly programs for specific CPUs. Memory Organization: Basic memory concepts, hierarchical organisation of computer memory, access time, cost, and capacity trade-offs, types of computer memory, Random Access Memory (RAM), Read-Only Memory (ROM), cache memory, cache mapping schemes, cache policies, virtual memory, implementation of virtual memory using paging and segmentation techniques, secondary storage systems (including magnetic, optical, and solid-state systems). Input / Output (I/O): Definition and design considerations of the I/O subsystem in a modern computer system, I/O control methods (including programmed I/O, interrupt-driven I/O, Direct Memory Access (DMA) and channel-attached I/O), basic interrupt service routines, operation of the I/O bus
Teaching Methodology	Face-to-Face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students

<table>
<tr><td></td><td>to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.</td></tr>
<tr><td>Bibliography</td><td>“The Essentials of Computer Organization and Architecture”, by Linda Null and Julia Lobur
“Computer Organization and Architecture” by William Stallings
“Structured Computer Organization” by Andrew Tanenbaum
“Computer Architecture: A Quantitative Approach” by John L. Hennessy
“Digital Design and Computer Architecture” by David Harris and Sarah Harris</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>70%</td></tr><tr><td>Assignments/Lab</td><td>20%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Circuits and Electronics II & Laboratory				
Course Code	ECE220				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	2rd Year / 4th Semester				
Teacher's Name	Konstantinos Katzis				
ECTS	12	Lectures / week	3 hours / 14 weeks	Laboratories / week	3 hours / 14 weeks
Course Purpose and Objectives	This course introduces students to solid state electronics. It presents semiconductors, diodes, and transistors. Basic transistor circuits for amplifiers and switches are analyzed in detail. The use of the operational amplifier as the basic building block for analogue electronic systems are presented. Various applications of the operational amplifier are examined. The Field-Effect Transistor is also presented. During the laboratory part, the students will have the opportunity to gain better understanding of the theoretical part, by carrying out a sequence of related experiments.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Describe the basics of semiconductors and diodes and design and analyze circuits for voltage rectification and regulation using diodes. • Illustrate the operation and properties of NPN and PNP transistors, including I-V characteristics, regions of operation, equivalent circuit models and their limitations, and transfer characteristic with a load resistor • Illustrate the operation and properties of nMOS (n-type metal-oxide semiconductor) and pMOS field-effect transistors, including I-V characteristics, regions of operation, equivalent circuit models and their limitations, enhancement-mode and depletion-mode devices, and transfer characteristic with a load resistor. • Describe the basics of operational amplifiers and examine the operation of a differential and ideal operational amplifier. • Recognise negative / positive feedback and explain its effects on an amplifier and explain both linear and non-linear applications of the operational amplifier. • Describe active filter circuits.				
Prerequisites	ECE205		Co-requisites	None	

Course Content	**Theoretical part** Diodes: Semiconductor diodes, diode characteristic, the Zener diode and voltage regulation, variable capacitance diodes. Full-rectified power supplies: Application of the junction diode for voltage rectification and power supply design. Voltage regulation. Integrated circuit voltage regulators. Introduction to switching mode power supplies. Bipolar junction transistor characteristics: The bipolar junction transistor, NPN and PNP types. Common base, common emitter and common collector configurations. Transistor biasing: The various methods for dc biasing of a transistor, mostly for the common emitter configuration. The DC operating point, dc load line. The cut-off and saturation regions. Small signal transistor amplifiers: The use of a transistor for a single stage small signal amplifier. The ac load line. Coupling capacitors. Multi-stage transistor amplifiers. Introduction to cascading stages for increasing the gain. Frequency response: Amplifier frequency response. The Bode plot for the gain and the phase shift of an amplifier. Push-Pull class B amplifiers: Introduction to the push-pull configuration for class B transistor amplifiers. Biasing. Amplifier power efficiency. Field Effect Transistors: Introduction to the Junction Field Effect Transistor (JFET). Basic operation. The biased JFET. Drain curves and the tranconductance curve. JFET approximations. The Metal Oxide Semiconductor FET (MOSFET). Depletion mode and enhancement mode MOSFETs. FET amplifiers and switches: The use of the JFET as the basic building block for simple small-signal amplifiers. The JFET as an analogue switch. Depletion mode MOSFET amplifiers. Enhancement mode MOSFET applications. Differential amplifiers: The differential amplifier configuration. Detailed analysis of its operation. Properties and characteristics of the differential amplifier. OP-AMP characteristics: The ideal characteristics of the operational amplifier. Input and output impedance, open loop gain and bandwidth. Temperature stability, offset currents and voltages. Output offset voltage, common mode gain. OP-AMP amplifiers: The inverting configuration. The non-inverting configuration. Analysis and design of simple circuits. Closed loop gain calculations. Small signal frequency response OP-AMP application circuits: The use of the op-amp in adder and mixer circuits. Integrators and differentiators. Review of the necessary conditions for oscillation.

	Active filter design: The OP-AMP as the active element in active filters. Low-pass, high-pass, band-pass, and band-stop filters. First degree and second degree transfer functions. Analysis of the characteristic equation. **Laboratory part** The laboratory part of the course comprises of a set of experiments which complement the theoretical material covered in class. The experiments focus on the basics of semiconductor devices and their applications and analyse experimentally circuits involving diodes, transistor and transistor amplifier circuits, differential amplifiers, operational amplifiers and active filters.
Teaching Methodology	Face - to – face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.
Bibliography	Malvino, A. P., Electronic Principles, McGraw-Hill Stanley, William D., Operational Amplifiers with Linear Integrated Circuits, Prentice Hall/MacMillan Floyd, Thomas L., Basic Operational Amplifiers and Linear Integrated Circuits, Prentice Hall/MacMillan Millman, J., Halkias, C., Integrated Electronics, Analogue and Digital Circuits ans Systems, McGraw-Hill Millman, J., Microelectronics, Digital and Analogue Circuits and Systems, McGraw-Hill Fortney, Lloyd, Principles of Electronics, Analogue and Digital, Oxford University Press Alley, Charles L. Atwood, Kenneth W., Microelectronics, Prentice-Hall International Editions Lab-Volt, FACET Computer based Laboratory

Assessment	Examinations 55% Assignments/Lab 35% Class Participation and Attendance 10% 100%
Language	English

Course Title	Signals and Systems Theory				
Course Code	ECE230				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	3rd Year / 6th Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to provide a comprehensive introduction to the fundamental axioms, theories and conventions underlying the operation of digital systems, and to equip students with the necessary skills which will allow them to analyse, design, test, and simulate the operation of basic digital circuits. The course follows an embedded laboratory approach, where students are required to utilize design and simulation tools during the implementation of lectures.				
Learning Outcomes	Upon succesful completion of this course students should be able to: • Explain the theory and applications of basic signal and system concepts (average value, energy, orthogonality, periodic and non-periodic and random signals) • Define and analyze continuous-time signals and systems and identify the relationship between time and frequency domain models. • Analyse periodic waveform and calculate the parameters of the Fourier series representation of any periodic waveform and transform time-domain signals using Fourier, Laplace and Z Transforms • Calculate the linear difference equation and the unit sample response for any linear discrete time system • Identify and explain the difference of Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) systems • Evaluate the transfer function for any linear discrete time system and stability • Develop simple mathematical models to represent signals and systems and draw the system diagram for certain unit sample responses and recognise the effects of noise on certain signal processing operations.				
Prerequisites	ECE205	Co-requisites	None		
Course Content	Signals and Systems: Basic concepts of signals and systems, in continuous and discrete time. Introduce linear, time invariant systems				

	and functions. Important categories of signal (periodic and non-periodic, random, energy signal and power signal). Define signal symmetry and explain the concept of orthogonality. Periodic signals: The Fourier trigonometric series, derivation and calculation of the Fourier coefficients. Input and output relationships. Band-limited signals. Frequency-domain models: Frequency domain representations and the Fourier Transform. Fourier Transform of signals Time-domain models: Discrete time signals, sampling, unit-sample response and convolution. FIR and IIR discrete time systems. Response of a discrete time system (convolution of input sequence with the unit sample response). Z Transforms & Laplace Transforms: The Z Transform and application to discrete time signals and systems. System response and stability of discrete time systems. Pole-zero models. The Laplace transform. Laplace models of signals (e.g. unit step function, exponential function, sinusoid etc). Inverse Laplace transform. Properties of Laplace transformations.
Teaching Methodology	Face- to- face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.
Bibliography	M.L. Meade and C.R. Dilon, Signals and Systems, Chapman and Hall. S.S. Soliman and M.D. Srinath, *Continuous and Discrete Signals and Systems*, Prentice Hall. C. Philips, J. Parr, E. Riskin, *Signals, Systems, and Transforms*, Prentice Hall. A.V. Oppenheim, A.S. Willsky, and S.H. Nawab, *Signals and Systems*, Prentice Hall.
Assessment	Examinations 70% Assignments/Lab 20% Class Participation and Attendance 10% 100%

Language	English				
Course Title	Digital Systems II & Laboratory				
Course Code	ECE300				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	3rd Year / 5th Semester				
Teacher's Name	TBA				
ECTS	12	Lectures / week	3 hours / 14 weeks	Laboratories / week	3 hours / 14 weeks
Course Purpose and Objectives	This course builds on the fundamental knowledge acquired during the prerequisite Digital Systems course and teaches the concepts and principles related to advanced digital design. It focuses on the use of Hardware Description Languages and the implementation of digital systems using reconfigurable logic devices. During the laboratory part of the course, students gain hands-on experience on the digital systems design lifecycle using appropriate CAD tools.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Describe the synchronous design methodology which partitions a system into a control unit section and a data-path section • Develop models of combinational and sequential digital logic circuits using a Hardware Description Language (HDL) • Describe the basic types of reconfigurable logic devices such as simple and complex Programmable Logic Devices (PLDs), and Field Programmable Gate Arrays (FPGAs) • Utilize effectively Computer-Aided Design (CAD) tools for the design of digital logic circuits • Model, simulate, verify, and test digital systems using reconfigurable logic devices such as simple and complex Programmable Logic Devices (PLDs), and / or Field Programmable Gate Arrays (FPGAs) • Describe the concept of a Finite State Machine (FSM), and utilize effectively appropriate FSM modelling tools such as state and timing diagrams				
Prerequisites	ECE200	Co-requisites	None		
Course Content	**Theoretical part** <u>Basic concepts</u>: Review of fundamental digital logic concepts, Boolean algebra, design of combinational circuits and function minimization tools, design of circuits with memory, flip-flops,				

	sequential circuits, Finite State Machines, Mealy and Moore FSMs, state-reduction, synchronous design using control section and data-path section. Introduction to HDL (VHDL, Verilog, or SystemC): Computer-Aided Design of digital systems, history and types of HDLs, modelling of fundamental logic elements using HDLs, structural and behavioural modelling using HDLs, design flow, compilation, simulation, and synthesis of HDL code, case studies. Programmable Logic Devices (PLDs): Definition and use of electronic devices which are used to for the development of reconfigurable digital logic circuits, basic types of PLDs, simple PLDs, Read-Only Memory (ROM), Programmable Array Logic (PAL), Programmable Logic Array (PLA), Generic Array Logic (GAL), complex PLDs (CPLDs), Field Programmable Gate Arrays (FPGAs). Algorithmic State Machine (ASM) Charts: Definition and components of ASM Charts, ASM blocks, derivation and realizations of ASM Charts, microprogramming techniques for ASM Charts. Designing Digital Systems with FPGAs: Designing functions and chains on FPGAs, logic blocks, dedicated FPGA features, HDL synthesis, design mapping, placement, and routing for specific implementation technologies. Verification & Testing: Definition and significance of verification in digital systems design, the verification flow, functional verification, timing verification, static timing analysis, design for testability, fault models, testing procedures for combinational and sequential logic circuits, boundary scan and the JTAG standard, memory testing, built-in testing. **Laboratory part** The laboratory part of the course comprises of a set of experiments which complement the theoretical material covered in class. The experiments focus on the implementation of HDL programming (VHDL, Verilog, or SystemC) within an FPGA / PLD Computer-Aided Design environment, for the purpose of designing, simulating, synthesizing, implementing and testing the operation of combinational and sequential logic circuits. FPGA boards will be used as the target of the synthesis process.
Teaching Methodology	Face- to- face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.

<table>
<tr><td></td><td></td></tr>
<tr><td>Bibliography</td><td>“Digital Systems Design Using VHDL” by by Charles H. Roth Jr., and Lizy K. John
“Digital System Design with FPGA”, by Cem Unsalan, and Bora Tar
“Digital Design: Principles and Practices”, by John F. Wakerly
“Digital Design: With an Introduction to the Verilog HDL, VHDL, and SystemVerilog” by M. Morris R. Mano, and Michael D. Ciletti
“Fundamentals of Digital Logic with VHDL Design”, by Stephen Brown and Zvonko Vranesic</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>55%</td></tr><tr><td>Assignments/Lab</td><td>35%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Advanced Computer Organization & Architecture				
Course Code	ECE305				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	3rd Year / 5th Semester				
Teacher's Name	Christos Dimopoulos				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The aim of this course is to build on the fundamental concepts of computer organization and architecture and provide students with a solid understanding of the concepts and considerations related to the design, operation and performance evaluation of high-end, modern computer systems. The course follows an embedded laboratory approach, where students are required to utilize CPU simulation tools during the implementation of lectures.				
Learning Outcomes	Upon successful completion of this course students should be able to: • Utilize effectively measures which allow the quantitative evaluation of computer systems' performance • Describe the principles and limitations of instruction level parallelism (ILP) • Describe ILP applications in high-performance processors such as superscalar execution, branch prediction and multithreading • Define multicore architectures, and critically compare alternative approaches to multicore organization • Describe basic techniques for optimizing the performance of computer memory systems				
Prerequisites	ECE210	Co-requisites	None		
Course Content	Introduction – Overview: Review of the fundamental concepts of computer organization and architecture, overview of the latest trends in computer systems design, quantitative measures for evaluating computer systems performance. Pipelining: The basic concept of pipelining, pipeline implementation, hazards in difficulties in pipeline implementation, mitigation techniques in pipeline implementation, pipeline case studies.				

	Instruction Level Parallelism (ILP): Basic definitions and limitations of ILP, methods for exploiting ILP, superscalar execution systems, branch prediction, dynamic scheduling, hardware-based speculation, static scheduling, simultaneous multithreading. Multicore architectures: Definition of shared-memory architectures, symmetric versus distributed shared-memory architectures, operational and performance issues, multicore processors organization, multicore multi-level caches, coherence schemes, on-chip multicore interconnect, scaling of multicore architectures, multicore case studies, review of large-scale microprocessor system considerations. Advanced Topics in Computer Memory Design: Review of basic computer memory definitions and operational principles, the memory hierarchical organization, cache performance optimization, virtual memory optimization, computer memory design case studies. Latest developments in the area of computer architecture and organization.
Teaching Methodology	Face- to- face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.
Bibliography	"Computer Architecture: A Quantitative Approach" by John L. Hennessy "Digital Design and Computer Architecture" by David Harris and Sarah Harris "Computer Organization and Architecture" by William Stallings "Inside the Machine: An Illustrated Introduction to Microprocessors and Computer Architecture" by Jon Stokes "The Essentials of Computer Organization and Architecture", by Linda Null and Julia Lobur
Assessment	Examinations 70% Assignments/Lab 20% Class Participation and Attendance 10% 100%
Language	English

Course Title	Embedded Systems & Laboratory				
Course Code	ECE310				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	3rd Year / 6th Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	3 hours / 14 weeks
Course Purpose and Objectives	The aim of this course is to provide students with the necessary skills which will allow them to design, interface, configure, and program Microcontroller Unit (MCU)-based Embedded Systems. During the laboratory part of the course, students will gain hands-on experience on the programming and configuration of real-life embedded systems by utilizing an MCU integrated development environment.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Describe how an embedded system compares to a general-purpose computer system and explain its significance in modern technological applications • Describe the typical functions and attributes of embedded systems • Design typical embedded systems applications and implement them using high-level and assembly programming languages • Describe how digital interfacing is implemented in modern embedded systems using both parallel and asynchronous / synchronous serial approaches • Describe how analogue interfacing is implemented in modern embedded systems, as well as the basic techniques for digital-to-analogue (DAC) and analogue-to-digital conversion (ADC)				
Prerequisites	ECE210	Co-requisites	None		
Course Content	**Theoretical part** <u>Introduction</u>: Definition of an MCU-based embedded system, embedded systems versus general-purpose computer systems, fundamental embedded system concepts, attributes, and operations, typical examples of embedded systems.				

	Input / Output Peripheral: General description and characteristics of the I/O peripheral, I/O configurations, I/O signals, interrupts and event triggering, peripheral interrupt configuration, periodic interrupts and hardware timers. Embedded systems programming: High-level programming languages and assembly programming languages, translating high-level language statements to equivalent assembly language, program translation (compilation, assembly, linking), memory considerations, debugging techniques, developing practical programming applications in embedded systems. Analogue Interfacing: Basic analogue interfacing concepts, quantization, sampling, Digital-to-Analogue (DAC) conversion, DAC concepts, DAC architectures, Analogue-to-Digital (ADC) conversion, ADC concepts, ADC architectures, analogue comparator. Serial Communications: Definition of serial communication, serial communication versus parallel communication, fundamental serial communication concepts (timing, framing, error detection, acknowledgments), asynchronous and synchronous serial communication protocols, timing diagrams for asynchronous and synchronous serial communication. **Laboratory part** The laboratory part of the course comprises of a set of experiments which complement the theoretical material covered in class. The experiments focus on the programming of a target physical embedded system using high-level / assembly programming languages. Laboratory tasks that students will be required to perform include: - Design simple embedded systems applications that include subroutines and functions - Perform program debugging for embedded systems applications - Develop programs that demonstrate general I/O operations for the target platform - Develop programs that demonstrate asynchronous serial communication operations for the target platform - Develop programs that demonstrate synchronous serial communication operations for the target platform - Develop programs that utilize external sensors for measuring physical properties - Develop programs that control a physical actuator through the target platform.

<table>
<tr><td></td><td>- Develop complete real-life embedded systems application for the target platform utilized in the laboratory</td></tr>
<tr><td>Teaching Methodology</td><td>Face- to- face

Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.</td></tr>
<tr><td>Bibliography</td><td>“Embedded Systems Fundamentals with Arm Cortex-M based Microcontrollers: A Practical Approach”, by Alexander G. Dean

“Introduction to Embedded Systems: Using Microcontrollers and the MSP430”, by Manuel Jiménez, Rogelio Palomera, Isidoro Couvertier

“Introduction to Embedded Systems”, by K.V. Shibu

“Introduction to Embedded Systems: Using ANSI C and the Arduino Development Environment”, by David Russell and Mitchell Thornton

“Embedded Systems with ARM Cortex-M Microcontrollers in Assembly Language and C”, by Yifeng Zhu</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>55%</td></tr><tr><td>Assignments/Lab</td><td>35%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Computer Engineering Design				
Course Code	ECE400				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 7th Semester				
Teacher's Name	Konstantinos Katzis				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The aim of the course is to give the students the opportunity to gain hands-on experience in Computer Engineering design projects. The course will reinforce the material covered in advanced courses in Computer Engineering such as Circuits and Electronics, Digital Systems and Data Communications and Computer Networks.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Identify and describe the values of project lifecycle including System specification, requirements, design, implementation, prototyping and testing of a product. • Demonstrate project lifecycle planning. • Explain briefly the concept of a system and a subsystem, and discuss the role of people, the different disciplines involved, and the need for interdisciplinary approaches to the development of the range of computer-based systems. • Explain the importance of design decisions and tradeoffs at the systems level, including balancing costs, performance, power, dependability, and market considerations. • Apply and practice hands-on techniques on a designated engineering design project in the area of Computer interfacing, Electronics, Data Communications and Computer Networks. • Write technical laboratory reports				
Prerequisites	ECE300, CSE300	Co-requisites	None		
Course Content	Description: Groups of three to four students work together on a Computer Engineering design project under the mentorship of an engineer from industry or a faculty adviser. Throughout the duration of the course, students must conduct the requirement analysis and system specification, design,				

<table>
<tr><td></td><td>implementation and testing. They must also demonstrate the project, and document it along the way. Students will have brief weekly discussions with the mentor on progress, and also present their progress in the labs weekly for feedback from the course faculty. At the end of the course, a final presentation event will be organised, where students will present their designs and demonstrate the projects. The projects are fully documented in a final written report.</td></tr>
<tr><td>Teaching Methodology</td><td>Face-to-face
Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.</td></tr>
<tr><td>Bibliography</td><td>According to the topics selected.</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Lab Reports</td><td>90%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Wireless and Mobile Networks				
Course Code	ECE405				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 7th Semester				
Teacher's Name	Konstantinos Katzis				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The aim of the course is to examine the structure and architecture of wireless and mobile networks, systems and applications. The mobility of nodes and end-users has behavioral implications on all layers of the OSI protocol stack form the Data Link up to the Application Layer. Handling and adapting to mobility necessitates the introduction changes in the protocol stack. Emerging applications enabled due to mobility will be investigated too.				
Learning Outcomes	Upon succesful completion of this course students should be able to: • Recall, classify and describe wireless technologies. • Analyse cellular wireless network topologies. • Analyse and compute physical property of wireless networks. • Recall and evaluate radio resource management techniques. • Compare and evaluate different wireless communication protocols.				
Prerequisites	CSE300	Co-requisites	None		
Course Content	Introduction: Wireless technology, transmission fundamentals, antennas and propagation, signal encoding techniques, coding and error control. Satellite Communications: Classification of satellite orbits, GEO orbit, LEO orbit, MEO orbit, link performance factors, capacity allocation strategies Cellular wireless networks: Cellular network organization, frequency reuse, hand-off strategies and metrics, power control, traffic engineering, traffic intensity, cellular wireless networks systems and services, GSM, GPRS, SMS, UMTS. Mobile IP:				

	Mobile IP uses and operation, registration, authentication, tunneling. The IEEE 802.XX standards: IEEE 802.11 Wireless LANs, Wireless LANs technologies, WLANs applications. Wireless Sensor Networks, architecture and network protocols. BlueTooth techniques BlueTooth Application Areas, BlueTooth Protocol Architecture. Internet of Things: Standards and Applications supporting long range / short range / low power communications. Performance evaluation based on cost, cost power, throughput and connectivity. Embedded systems implementing IoT. Hardware options for adding wireless connectivity to an embedded system. Design considerations for IoT embedded systems to support long range communications. IoT connectivity architectures and current security options.
Teaching Methodology	Face-to-face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.
Bibliography	William Stallings, Wireless Communications and Networks, Prentice Hall Yi-Bing Lin, Imrich Chlamtac, Wireless and Mobile Network Architectures, John Wiley & Sons Ellen Kayata Wesel, Wireless Multimedia Communication Networking Video, Voice and Data , Addison-Wesley Theodore S. Rappaport, Wireless Communications Principles & Practices, Prentice Hall K. Pahlavan and P. Krishnamurthy, Principles of Wireless Networks, Prentice Hall C. Siva Ram Murthy, B.S. Manoj: Ad-hoc Wireless Netorks: Architectures and Protocols, Pearson Education
Assessment	Examinations 70% Assignments/Lab 20% Class Participation and Attendance 10% 100%
Language	English

Course Title	Senior Design Project				
Course Code	ECE495				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 7th Semester				
Teacher's Name	Christos Dimopoulos				
ECTS	12	Lectures / week	N/A	Laboratories / week	N/A
Course Purpose and Objectives	The aim of this course is to provide students with experience in the implementation of a complete Computer Engineering project, including the tasks of project planning and project management.				
Learning Outcomes	Upon successful completion of this course students should be able to: • Apply the theoretical knowledge gained in previous Program courses in the design and implementation of a Computer Engineering project • Develop a technical report describing the implementation of the project • Present in a technical manner the development of the project				
Prerequisites	Senior Standing	Co-requisites	None		
Course Content	A project in Computer Engineering domain is chosen by the student, subject to faculty approval, who implements a project by following the technical steps of literature review, system analysis and design, implementation, and testing. The student develops a technical report of the project upon which s/he is orally examined. The project work is supervised by a faculty member of the DCSE Department.				
Teaching Methodology	Face-to-Face				
Bibliography	The Senior Project Handbook				
Assessment	Examinations 0% Assignments/Lab 0% Project 100% 100%				
Language	English				

Course Title	Systems Analysis and Design				
Course Code	CSE230				
Course Type	Elective				
Level	Bachelor (1st cycle)				
Year / Semester	4th Year / 8th Semester				
Teacher's Name	Yianna Danidou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to introduce students to the principles of Information Systems (IS) development. The lifecycle stages are explained in detail. Traditional and novel systems' development methodologies are described and their basic characteristics are compared. Students learn how to apply the modeling tools of systems' development methodologies in realistic development cases.				
Learning Outcomes	Upon succesful completion of this course students should be able to: • Describe the concept of Information Systems and analyze the differences between Information Systems and other types of software systems • Describe the basic stages of the systems' lifecycle development process and discuss their interrelationship and its importance • Describe various systems' development methodologies and evaluate their relative merits • Explain project management in support of system analysis projects • Articulate the responsibilities and key skillsets of an effective systems analyst • Develop and analyse a business case and system requirements • Describe the operation of modeling tools in systems' development methodologies and apply them in realistic development cases				
Prerequisites	CSE120	Co-requisties	None		
Course Content	Phase I: Systems Planning Introduction to Systems Analysis and Design: introduction, what is information technology, information systems components, business today, modelling business operations, business information systems, what information do users need, systems development tools, systems development methods, the information technology department. Analyzing the Business Case: a framework for IT Systems development, what is a business case, information systems projects,				

	evelauation of systems requirements, overview of feasibility, evaluating feasibility, setting priorities, preliminary investigation overview Managing Systems Projects: overview of project management, creating a work breakdown structure, identifying task patterns, calculating the critical path, project monitoring and control, reporting, project management examples, project management software, risk management, managing for success Phase II: Systems analysis Requirements Modeling: systems analysis phase overview, joint application development, rapid application development, agile methods, modelling tools and techniques, system requirements checklist, future growth, costs, and benefits, fact-finding, interviews, other fact-finding techniques, documentation, information management software, preview of logical modeling Data and Process Modeling: overview of data and process modelling tools, data flow diagrams, creating a set of DFDs, guidelines for drawings DFDs, data dictionary, process description tools, logical versus physical models. Object Modeling: overview of object oriented analysis, relationships among objects and classes, object modelling with the UML, organising the object model Development Strategies: development strategies overview, the impact of the internet, outsourcing, in-house software development options, the system analyst's role, analysing cost and benefits, the software acquisition process, completion of systems analysis tasks, transition to systems design Part III: Systems design User Interface Design: systems design phase overview, what is a user interface, seven habits of successful interface designers, guidelines for user interface design, source document and form design, printed output, technology issues, security and control issues, prototyping. Data Design: data design concepts, DBMS components, web-based design, data design terms, entity-relationship diagrams, data normalisation, using codes, data storage and access, data control System Architecture: architecture checklist, system architecture: then and now, client/ server designs, the impact of the internet, e-commerce architecture, processing methods, network models, wireless networks Phase IV: Systems implementation Managing Systems Implementation: software quality assurance, overview of application development, structured application development, object-oriented application development, agile application development, coding, testing the system, documentation, management approval. Managing Systems Support and Security

Teaching Methodology	Face- to- face
Bibliography	Scott Tilley and Harry J. Rosenblatt, Systems Analysis and Design, Cengage Kenneth E. Kendall and Julie E. Kendall, Systems Analysis and Design Alan Dennis , Barbara Haley Wixom, Systems Analysis and Design: An Object-Oriented Approach with UML John W. Satzinger , Robert B. Jackson, Systems Analysis and Design in a Changing World
Assessment	Examinations 70% Assignments/Lab 20% Class Participation and Attendance 10% 100%
Language	English

Course Title	Fundamentals of Distributed Systems with Cloud computing				
Course Code	CSE315				
Course Type	Elective				
Level	Bachelor (1st Cycle)				
Year / Semester	3rd Year / 6th Semester				
Teacher's Name	Katerina Papanikolaou				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course studies the key design principles of distributed systems, which are collections of independent networked computers that function as single coherent systems. It covers fundamental concepts of distributed systems including network architectures, communication protocols, processes and threads and naming. It covers important paradigms in distributed systems, including logical clocks, distributed mutual exclusion; consistency, replication, fault tolerance, coordination and agreement and security. It addresses failures and fault-tolerance techniques in diverse applications, such as consensus, transactions, replicated data management, and self-stabilization. The Cloud Computing paradigm is introduced with its fundamentals principles, requirements, benefits, applications and challenges.				
Learning Outcomes	Upon successful completion of the course, students will be able to: • Explain and discuss the principles and theoretical models used in designing distributed systems. • Describe the trade-offs which must be made when designing a distributed system. • Describe and evaluate algorithms and architectural models used in implementing distributed file systems, logical clocks, elections, mutual exclusion, multicast message ordering, transactions, replication and peer-to-peer networks in distributed systems. • Explain the core concepts of Cloud Computing, characteristics, benefits, challenges, applications, • Apply the fundamental concepts of Cloud computing to evaluate trade-offs between different Cloud Computing solutions				

Prerequisites	CSE300	Co-requisites	None
Course Content	Course Contents: Fundamentals: definition of a distributed system, properties of distributed systems (distribution transparency, openness), scalability, types of distributed systems. architectures of distributed systems. processes, threads, virtualization, clients, servers, code migration. Communication: layered protocols, types of communication, remote procedure call, message-oriented communication, stream-oriented communication, multicast communication. Naming: names, identifiers, and addresses, flat and structured naming, attribute-based naming. Coordination: clock synchronization, physical clocks, global positioning system, clock synchronization algorithms, logical clocks, Lamport's logical clocks, vector clocks. mutual exclusion: centralized, decentralized, distributed algorithm, a token ring algorithms, comparison of them. Election algorithms: traditional election algorithms, elections in wireless environments, elections in large-scale systems. Consistency and replication: reasons for replication, data-centric consistency models, client-centric consistency models: eventual consistency, monotonic reads & writes. Replica management, consistency protocols. Fault tolerance: basic concepts, failure models, process resilience: failure masking and replication, agreement in faulty systems, failure detection. reliable client-server communication: point-to-point communication, reliable group communication: basic reliable-multicasting schemes, scalability in reliable multicasting, atomic multicast. Distributed commit, recovery. Security: introduction, secure channels, access control. Distributed object-based systems, distributed file systems, distributed web-based systems, distributed coordination-based systems: architecture, processes, communication, naming, synchronization, consistency and replication, fault tolerance. Introduction to Cloud Computing Cloud computing enabling technologies, infrastructures, virtualization in the cloud, software defined networks and storage, cloud storage,		

<table>
<tr><td></td><td>cloud programming models, public infrastructures Amazon Web Services (AWS), Microsoft Azure,</td></tr>
<tr><td>Teaching Methodology</td><td>Face- to- face</td></tr>
<tr><td>Bibliography</td><td>A. Tannenbaum, M. van Steen, Distributed Systems: Principles and Paradigms, Prentice Hall.

G. Coulouris, J. Dollimore, T. Kindberg, Distributed Systems: Concepts and Design, Addison-Wesley.

T. Erl, Z. Mahmood, and R. Puttini. Cloud Computing: Concepts, Technology and Architecture, Pearson.</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>70%</td></tr><tr><td>Assignments/Lab</td><td>20%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Artificial Intelligence				
Course Code	CSE330				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	3rd Year / 6th Semester				
Teacher's Name	Alberto Calzada				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	History, theory, and computational methods of artificial intelligence. Basic concepts include representation of knowledge and computational methods for reasoning. The students will also be exposed to different applications areas of AI, such as expert systems, robotics, computer vision, natural language understanding, and planning.				
Learning Outcomes	By the end of the semester, students should be able to: • Describe the functions of intelligent agents, and create computational agents in a programming language • Identify the major classical and modern AI paradigms, and explain how they relate to each other • Explain the concept of planning, and construct planning agents in a programming language. • Analyze the structure of a given problem such that they can choose an appropriate paradigm in which to frame that problem • Implement a wide variety of both classical and modern AI algorithms				
Prerequisites	CSE210, MAT225	Required	None		
Course Content	Introduction to Artificial Intelligence: What is AI; The Foundations of Artificial Intelligence; The History of Artificial Intelligence; The State of the Art; Intelligent Agents; Agents and Environments; Good Behavior: The Concept of Rationality; The Nature of Environments; The Structure of Agents Problem-solving: Solving Problems by Searching; Problem-Solving Agents; Example Problems; Searching for Solutions; Uninformed Search Strategies; Informed (Heuristic) Search Strategies; Heuristic Functions; Beyond Classical Search; Local Search Algorithms and Optimization Problems; Local Search in Continuous Spaces; Searching with Nondeterministic Actions; Searching with Partial Observations; Online Search Agents and Unknown Environments; Advanced Searching Strategies:				

	Adversarial Search; Games; Optimal Decisions in Games; Alpha—Beta Pruning; Imperfect Real-Time Decisions; Stochastic Games; Partially Observable Games; State-of-the-Art Game Programs; Alternative Approaches; Defining Constraint Satisfaction Problems; Constraint Propagation: Inference in CSPs; Backtracking Search for CSPs; Local Search for CSPs; The Structure of Problems; Knowledge and Logic: Knowledge-Based Agents; Logic; Propositional Logic: A Very Simple Logic; Propositional Theorem Proving; Effective Propositional Model Checking; Agents Based on Propositional Logic; First-Order Logic; Syntax and Semantics of First-Order Logic; Using First-Order Logic; Knowledge Engineering in First-Order Logic; Propositional vs. First-Order Inference; Unification and Lifting; Forward Chaining; Backward Chaining; Resolution Planning: Definition of Classical Planning; Algorithms for Planning as State-Space Search; Planning Graphs; Other Classical Planning Approaches; Analysis of Planning Approaches; Planning and Acting in the Real World; Time, Schedules, and Resources; Hierarchical Planning; Planning and Acting in Nondeterministic Domains; Multiagent Planning; Knowledge Representation: Ontological Engineering; Categories and Objects; Events; Mental Events and Mental Objects; Reasoning Systems for Categories; Reasoning with Default Information; The Internet Shopping World; Quantifying Uncertainty; Acting under Uncertainty; Basic Probability Notation; Inference Using Full Joint Distributions; Independence; Bayes' Rule and Its Use; Probabilistic Reasoning; Representing Knowledge in an Uncertain Domain; The Semantics of Bayesian Networks; Efficient Representation of Conditional Distributions; Exact Inference in Bayesian Networks; Approximate Inference in Bayesian Networks; Relational and First-Order Probability Models; Other Approaches to Uncertain Reasoning; Time and Uncertainty; Inference in Temporal Models; Hidden Markov Models; Kalman Filters; Dynamic Bayesian Networks; Keeping Track of Many Objects;
Teaching Methodology	Face – to – face
Bibliography	Russel, S. and Norvig, P. Artificial Intelligence: A Modern Approach, Pearson. Neapolitan, R. E. and Jiang, X. Artificial Intelligence: With an Introduction to Machine Learning, CRC Press. Negnevitsky, M. Artificial Intelligence: A Guide to Intelligent Systems, Addison-Wesley

Assessment	Mid – Term Examination 30% Final Examination 30% Assignments/Lab 30% Class Participation and Attendance 10% 100%
Language	English

Course Title	Network Fundamentals				
Course Code	ECE361				
Course Type	Elective				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 7th Semester				
Teacher's Name	Pericles Leng Cheng				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing, and the fundamentals of Ethernet concepts, media and operations, are introduced to provide a foundation for the curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Identify and describe the devices and services used to support communications in data networks and the Internet • Describe the role of protocol layers in data networks • Explain the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments • Design, calculate, and apply subnet masks and addresses to fulfil given requirements in IPv4 and IPv6 networks • Explain fundamental Ethernet concepts such as media, services, and operations • Build a simple Ethernet network using routers and switches • Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations • Employ common network utilities to verify small network operations and analyze data traffic				
Prerequisites	CSE300	Co-requisites	None		
Course Content	Exploring the Network: Globally Connected, LANs, WANs, and the Internet, The Network as a Platform, The Changing Network Environment Configuring a Network Operating System: IOS Bootcamp, Getting Basic, Addressing Schemes Network Protocols and Communications: Rules of Communication, Network Protocols and Standards, Moving Data in the Network				

<table>
<tr><td></td><td>Network Access: Physical Layer Protocols, Network Media, Data Link Layer Protocols, Media Access Control

Ethernet: Ethernet Protocol, Address Resolution Protocol, LAN Switches

Network Layer: Network Layer Protocols, Routing, Routers, Configuring a Cisco Router

Transport Layer: Transport Layer Protocols, TCP and UPD

IP Addressing: IPv4 Network Addresses, IPv6 Network Addresses, Connectivity Verification

Subnetting IP Networks: Subnetting an IPv4 Network, Addressing Schemes, Design Considerations for IPv6

Application Layer: Application Layer Protocols, Well-Known Application Layer Protocols and Services, The Message Heard Around The World

It’s a Network: Create and Grow, Keeping the Network Safe, Basic Network Performance, Managing IOS Configuration Files, Integrated Routing Services</td></tr>
<tr><td>Teaching Methodology</td><td>Face- to- face

Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.</td></tr>
<tr><td>Bibliography</td><td>“CCNA Routing and Switching Official Cert Guide - Academic” by Wendell Odom

“CCENT ICND1 Study Guide” by Todd Lammle

“A Practical Guide to Advanced Networking and Cisco CCENT ICND1 100-101” by Beasley, Nilkaew, Odom & Wilkins</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>70%</td></tr><tr><td>Assignments/Labs</td><td>20%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Routing & Switching				
Course Code	ECE362				
Course Type	Elective				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 8th Semester				
Teacher's Name	Pericles Leng Cheng				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPng, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Explain basic switching concepts and the operation of Cisco switches • Define the purpose, nature, and operations of a router, routing tables, and the route lookup process • Demonstrate how VLANs create logically separate networks and how routing occurs between them • Describe dynamic routing protocols, distance vector routing protocols, and link-state routing protocols • Configure and troubleshoot static routing and default routing (RIP and RIPng) • Configure and troubleshoot an Open Shortest Path First (OSPF) network • Define, configure, and troubleshoot access control lists (ACLs) for IPv4 and IPv6 networks • Configure, and troubleshoot Dynamic Host Configuration Protocol (DHCP) for IPv4 and IPv6 networks • Configure, and troubleshoot Network Address Translation (NAT) operations				
Prerequisites	ECE361	Co-requisites	None		
Course Content	Introduction to Switched Networks: LAN Design, The Switched Environment Basic Switching Concepts and Configuration: Basic Switch Configuration, Switch Security: Management and Implementation				

	VLANs: VLAN Segmentation, VLAN Implementations, VLAN Security and Design Routing Concepts: Initial Configuration of a Router, Routing Decisions, Router Operation Inter-VLAN Routing: Inter-VLAN Routing Configuration, Troubleshoot Inter-VLAN Routing, Layer 3 Switching Static Routing: Static Routing Implementation, Configure Static and Default Routes, Review of CIDR and VLSM, Configure Summary and Floating Static Routes, Troubleshoot Static and Default Route Issues Routing Dynamically: Dynamic Routing Protocols, Distance Vector Routing Protocols, RIP and RIPng Routing, Link-State Dynamic Routing, The Routing Table Single-Area OSPF: Characteristics of OSPF, Configuring Single-Area OSPFv2, Configuring Single-Area OSPFv3 Access Control Lists: IP ACL Operation, Standard IPv4 ACLs, Extended IPv4 ACLs, Troubleshoot ACLs, IPv6 ACLs DHCP: Dynamic Host Configuration Protocol v4, Dynamic Host Configuration Protocol v6 Network Address Translation for IPv4: NAT Operation, Configuring NAT, Troubleshooting NAT
Teaching Methodology	Face- to- face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.
Bibliography	“CCNA Routing and Switching Official Cert Guide - Academic” by Wendell Odom “CCENT ICND1 Study Guide” by Todd Lammle “A Practical Guide to Advanced Networking and Cisco CCENT ICND1 100-101” by Beasley, Nilkaew, Odom & Wilkins
Assessment	Examinations 70% Assignments/Labs 20% Class Participation and Attendance 10% 100%
Language	English

Course Title	Internship Project				
Course Code	ECE418				
Course Type	Elective				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 8th Semester				
Teacher's Name	Christos Dimopoulos				
ECTS	6	Lectures / week	N/A	Laboratories / week	N/A
Course Purpose and Objectives	The aim of the suggested scheme is to provide students with the opportunity to gain practical experience within an industrial environment on the implementation of a real-life computer engineering project.				
Learning Outcomes	Upon successful completion of this course students should be able to: • Understand the process and the considerations of applying scientific knowledge within an industrial ICT environment • Apply the scientific knowledge gained in computer engineering courses to an industrial ICT case study • Gain experience in developing an industrial project report				
Prerequisites	None	Co-requisites	None		
Course Content	An internship project in the area of Computer Engineering is completed by the student within the premises of a private or a public sector company, subject to faculty approval. Upon the completion of the internship project the student submits a written report describing the tasks accomplished and the satisfaction of the project's objectives. The internship project work is co-supervised by a member of DCSE (internal 'mentor') and an employee from the company within which the internship project will take place (external 'mentor').				
Teaching Methodology	Work Placement				
Bibliography	The Internship Project Handbook				
Assessment	Project	100%			
		100%			
Language	English				
Course Title	Digital Signal Processing				

Course Code	ECE425				
Course Type	Elective				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 8th Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	Digital Signal Processing (DSP) is used in numerous real life applications. The aim of this course is to get the students to learn about digital signals, and about processing techniques. In particular sampling, transformations and digital filter design are studied. By the end of the course students will gain experience in designing and analyzing DSP systems.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Define the basic algorithms of processing one dimensional digital signals • Define the basic signal transforms and their use in signal processing • Design digital filters for enhancing/depressing different signal characteristics. • Describe real life applications of Digital Signal Processing.				
Prerequisites	ECE230	Co-requisites	None		
Course Content	Introduction: Benefits of digital over analogue signal processing, typical real life applications and uses of DSP, Sampling and Reconstruction of Signals, key DSP operations (convolution, correlation, digital filtering, discrete transformation) Fourier Discrete Transform (DFT): Fourier Series and the Fourier transform, the Discrete Fourier transform (DFT) and its inverse, computational complexity. Comparison with other discrete transforms (Discrete cosine and Walsh transform) The z-transform: The z-transform, the inverse z-transform (power series method, partial fraction expansion method, residue method), properties of the z-transform. Application of the z-transform (frequency response				

	estimation, pole-zero description of signals, stability considerations, impulse response estimation). Correlation and Convolution: Cross and auto-correlation, applications of correlation, implementation of fast correlation. Properties of convolution, circular convolution, fast linear convolution, implementation. Digital Filter Design: Introduction, types of digital filters, filter design (specification, coefficient calculation, realization, analysis and implementation). Finite impulse response (FIR) and infinite impulse response digital filters (IIR) filter design. Further topics in DSP: Multi-rate Digital Signal Processing (Uses of multi-rate DSP, sampling rate increase/decrease, design of sampling rate converters). Spectrum estimation and analysis (Principles of spectrum estimation, parametric and non-parametric spectrum estimation techniques, comparison of estimation methods) Practical applications - case studies: Overview of DSP Integrated circuits, block level design of DSP systems, analysis of key applications of DSP, implementation of DSP systems for particular real life applications.
Teaching Methodology	Face- to- face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.
Bibliography	E. C. Ifeachor and B. W. Jervis, *Digital Signal Processing - A Practical Approach*, Addison-Wesley R D Strum and D E Kirk, *First Principles of Discrete Systems and Digital Signal Processing*, Addison-Wesley K. Steiglitz, *A Digital Signal Processing Primer*, Addison-Wesley R. Kuc, Introduction to Digital Signal Processing, McGraw-Hill John Proakis and Dimitris Manolakis, *Digital Signal Processing*, Principles, Algorithms and Applications, Prentice Hall J. Candy, *Signal Processing*, McGraw-Hill

	C.D. McGillem and G. R. Cooper, Continuous and Discrete, Signal and System Analysis CBS, International Editions Richard G. Lyons, Understand Gigital Signal Processing, Prentice Hall
Assessment	Examinations 70% Assignments/Lab 20% Class Participation and Attendance 10% 100%
Language	English

Course Title	Parallel and Distributed Computing				
Course Code	ECE430				
Course Type	Elective				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 8th Semester				
Teacher's Name	Vicky Papadopoulou Lesta				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The course aims to introduce students to the technologically important area of parallel and distributed computing, and how local computation and information exchange can result to a global computation and problem solving. Important architectures and technological tools and advances of parallel computer machines are discussed. The course introduce the students to important characteristics and algorithms for important problems of distributed and parallel systems and computer communication networks, such as multi-core, distributed shared memory, message passing, fault-tolerance, consensus, and leader election.				
Learning Outcomes	Upon successful completion of the course, students will be able to: • Describe and discuss parallel computing and performance measures • Explain parallel and distributed computing models and architectures • Describe and apply parallel and distributed programming languages, environments and algorithms in parallel and distributed settings • Describe, utilize and compare important distributed and parallel algorithms for each model, for various important problems such as routing, sorting, numerical and control problems • Understand, discuss and apply fundamental concepts in the area of message passing and shared memory concurrency • Analyze and compare parallel and distributed algorithms for correctness, reliability, and performance.				
Prerequisites	CSE320	Co-requisites	None		
Course Content	Distributed systems Protocols: The model, Communication protocols, Routing algorithms				

	Deadlock-free packet switching Fundamental Algorithms: Wave and traversal algorithms, Election algorithms, Termination detection, Synchrony in networks Fault Tolerance: Fault tolerance in distributed systems Parallel systems Introduction, The Power and Potential of Parallelism, Examining Sequential and Parallel Programs, Parallelism Using Multiple Instruction Streams, Scalable Performance and Portability Parallel Computers And Their Model: Balancing Machine Specifics with Portability, A Look at Five Parallel Computers, The RAM: An Abstraction of a Sequential Computer, The PRAM: A Parallel Computer Model Reasoning about Performance: Basic Concepts, Performance Trade-Offs, Measuring Performance First Steps Towards Parallel Programming: Task and Data Parallelism Scalable Algorithmic Techniques: The Inevitability of Trees, Blocks of Independent Computation, Schwartz' Algorithm, Assigning Work To Processes Statically and Dynamically, The Reduce & Scan Abstractions, Trees Programming with Threads: POSIX Threads, Thread Creation and Destruction, Mutual Exclusion Synchronization, Safety Issues, Performance Issues Open MP: Examples, Thread Behavior and Interaction Sections Local View Programming Languages: MPI: The Message Passing Interface, Getting Started, Safety Issues, Performance Issues Introduction to General General-Purpose GPU Programming with CUDA.
Teaching Methodology	Face- to- face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.
Bibliography	Vipin Kumar, George Karypis, Anshul Gupta, Ananth Grama, Introduction to Parallel Computing, Addison-Wesley Introduction to Distributed Algorithms, Gerard Tel, Cambridge University Press.

<table>
<tr><td></td><td>Calvin Lin, Larry Snyder, Principles of Parallel Programming, Pearson

Michael J. Quinn, Parallel Computing, Theory and Practice, McGraw-Hill

Ian Foster, Designing and Building Parallel Programs: Concepts and Tools for Parallel Software Engineering, Addison-Wesley Longman

Jason Sanders, Edward Kandrot, CUDA by Example: An Introduction to General-Purpose GPU Programming, NVIDIA, Addison Wesley.</td></tr>
<tr><td>Assessment</td><td><table><tr><td>Examinations</td><td>70%</td></tr><tr><td>Assignments/Lab</td><td>20%</td></tr><tr><td>Class Participation and Attendance</td><td>10%</td></tr><tr><td></td><td>100%</td></tr></table></td></tr>
<tr><td>Language</td><td>English</td></tr>
</table>

Course Title	Contemporary Topics				
Course Code	ECE450				
Course Type	Elective				
Level	Bachelor (1st Cycle)				
Year / Semester	4th Year / 4th Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	The objective of this course is to provide students with the opportunity to gain knowledge in cutting-edge Computer Engineering topics which are not included in the current curriculum of the Computer Engineering Program. The course contents are developed according to the topic in consideration.				
Learning Outcomes	Upon successful completion of this course, students should be able to: • Define, explain and employ material related to subjects in the field of Computer Engineering that are not included in the regular curriculum but rather stem from faculty research on a relative field • Recognize and classify trends in the field of Computer Engineering • Identify and explain developments in the field of Computer Engineering				
Prerequisites	None	Co-requisites	None		
Course Content	The syllabus for this course will be different for every time the course is offered. It is the responsibility of the department to prepare the syllabus at least three months before the beginning of each semester.				
Teaching Methodology	Face- to- face Students in this course are expected to work on group activities, such as projects, assignments, literature reviews that may deal with the investigation and solution of a problem or with the design and/or implementation of a system. Group activities aim to motivate students to work within a group, develop critical thinking, improve their communication and decision-making skills, and promote active learning.				

Bibliography	TBA
Assessment	Examinations 75% Assignments/Lab 15% Class Participation and Attendance 10% 100%
Language	English

Appendix 4 : Revised Program Structure

Computer Engineering, 4 Years/240 ECTS (BSc)

DEGREE REQUIREMENTS	**ECTS**
All students pursuing a Bachelor of Science in the "Computer Engineering" program must complete the following requirements:	
General Education Requirements	**12**
Science Requirements	12
Mathematics Requirements	42
Major Requirements	**156**
Free Electives	18
Total Requirements	**240**

General Education Requirements		**12 ECTS**
ENL103	Instruction in Expository Writing	6
CSE215	Writing for Computer Science & Engineering	6

Science Requirements		**12 ECTS**
PHY 100	Physics I	6
PHY 110	Physics II	6

Mathematics Requirements		42
MAT140	Mathematical Foundations for Science and Engineering	6
MAT150	Calculus I	6
MAT160	Linear Algebra	6
MAT170	Discrete Structures	6
MAT200	Calculus II	6
MAT210	Differential Equations	6
MAT225	Probability & Statistics	6

Major Requirements		**168**
CSE100	Programming Principles I – Robotics Lab	6
CSE120	Programming Principles II – Robotics Lab	6
CSE200	Data Structures & Algorithms	6
ECE105	Problem-Solving Fundamentals & Measurements	6
ECE200	Digital Systems I	6
ECE205	Circuits & Electronics I	6
ECE210	Computer Organization & Architecture	6
ECE220	Circuits & Electronics II & Laboratory	12
ECE230	Signals & Systems Theory	6

CSE300	Data Communications and Computer Networks	6
CSE320	Operating Systems	6
CSE405	Information Security	6
ECE300	Digital Systems II & Laboratory	12
ECE305	Advanced Computer Organization and Architecture	6
ECE310	Embedded Systems & Laboratory	12
ECE400	Computer Engineering Design	6
ECE405	Wireless & Mobile Networks	6
ECE495	Senior Design Project	12

Major Electives **(Students select four (4) of the following 9 courses)**		**24**
CSE230	Systems Analysis and Design	6
CSE315	Fundamentals of Distributed Systems with Cloud computing	6
CSE 330	**Artificial Intelligence**	**6**
ECE361	Network Fundamentals	6
ECE362	Routing & Switching	6
ECE418	Internship Project	6
ECE425	Digital Signal Processing	6
ECE430	Parallel & Distributed Computing	6
ECE450	**Contemporary Topics**	6

European University Cyprus

Appendix 5

Professional Development Seminars for newly hired full-time and part-time academic staff Preliminary Program F2021			
Topics	**Date**	**Mode of Delivery**	**Speaker**
1. Orientation (2 hours) a. Course Outlines	September 2021	Online Live Recorded	Loizos Symeou (Vice Rector of Academic Affairs)
b. BB Familiarization and MIS Support Structures	September 2021	Online Live Recorded	Miltiades Hadjiannou
2. Distance Learning (6 hours)	20-30 September 2021	Online Live Recorded	TBA & Paraskevi Chatzipanagiotou (Distance Education Committee)
3. Presentation of EU co-funded project Becom (Between interaction and innovation: creating communication space in the digital world)	Early September 2021	Online Live Recorded	TBA & Marina Appios
4. Assigning and evaluating group work in higher education	October 2021	Online Live Recorded	TBA
5. New BB tools	October or November 2021	Online Live Recorded	

Existing Resources:

- Turnitin (Constandina Charalambous)
- Welcome (Loizos Symeou)
- Online Teaching and Learning
- Research Policy
- Research Ethics
- Personal Data in Research
- Ενιαία εκπαίδευση, διαφοροποίηση και δομές υποστήριξης
    - Φιλοσοφία και πρακτική της ενιαίας εκπαίδευσης
    - Βασικές αρχές διαφοροποίησης
    - Δομές υποστήριξης (ΕΦΕΕΑ)

European University Cyprus

Faculty Development Program for Academic Staff Spring 2021
Interactive activities in online and distance education teaching and learning • Exchange of best practices and tools (3.2.2021, organized by Distance Education Unit) • In-house trainings at School level for full time and part time staff
Research promotion seminars • Seminar **on Research Ethics** by the Vice Rector of External Affairs and Research, Professor A. Efstathiou (18.3.2021) • Seminar on **Promoting and Supporting Open Science in Higher Education**, by Professor M. Meletiou, Department of Education Sciences (20.5.2021) • **Personal data management in Research** (12.4.21, by Mr. Alexandros Schizas, University DPO) • In-house trainings at School level for full time and part time staff on the use of Turnitin
Internationalization of higher education: • Seminar on the promotion of Internationalization in Higher Education, Professor A. Efstathiou, Vice Rector of External Affairs and Research & Ms Efi Michael, Erasmus Advisor (12.5.21)

European University Cyprus

No.	Faculty Development Seminar Topic (F2020 Series)	Date	Offered by
1	EUC LMS Platforms: Creating and managing Moodle Courses	22.9.2020	Militades Hadjioannou, MIS
	EUC LMS Platforms: Creating and managing Blackboard Courses	23.9.20	Militades Hadjioannou, MIS
2	Welcome All New Academic Staff Meetings	25.9.2020	Professor Loizos Symeou, Vice Rector of Academic Affairs
3	Preparing for your Courses and your Course Outline	25.9.2020	Professor Loizos Symeou, Vice Rector of Academic Affairs
4	Pedagogical Approaches to Online Teaching and Learning	25.9.2020	Dr. Loucas Louca, Department of Education Sciences
5	Designing an online course:Tools and practices	20.10.2020	Professor Maria Meletiou, Dr. Maria Papazachariou, Dr. Philippe Jougleux, Dr. Lycourgos Hadjiphanis, Dr. Andreas Avgerinos, EUC academic staff
6	Inclusive Education in the Context of Higher Education and supporting services	27.11.2020	Dr Katerina Mavrou and Dr. Maria Tsakiri, Department of Education Sciences/ Dr. Panagiotis Parpottas & staff of CSSEN Ms Yianna Christofi and Ms Ioanna Ioannou
7	Assessment in online teaching	16.12.2020	Professor Loizos Symeou, Professor Marios Vryonides and Dr. Eleni Theodorou,

			Department of Education Sciences
8	Framework of implementation exams in online teaching (F2020)	29.10.2020	Dr. Loucas Louca, Department of Education Sciences & Mlitiades Hadjioannou, MIS
9	The implementation of the HyFlex Course Model delivery: The Docking Station	14-25.9.2020	Mlitiades Hadjioannou, MIS
10	The EUC Distance Learning Fundamental Principles, Pedagogical Model and Infrastructure	28.9.2020	Dr Paraskevi Chatzipanagiotou, Director of DEU
11	Design and delivery of a distance learning course, the educational material and the digital transformation of the educational material, e-assessment and feedback in distance learning	29.10.2020	Dr. Ioanna Vekyri, Scientific Collaborator, Department of Education Sciences

Departmental Policy for CSC418 / ECE418 Internship Project Course

1. Introduction

This document describes the departmental policy which will be followed for the CSC418 / ECE418 'Internship Project' course. This course concerns the implementation of industry-based projects (internships) by students pursuing their BSc in Computer Science and BSc in Computer Engineering degrees. The aim of the suggested scheme is to provide students with the opportunity to gain practical experience within an industrial ICT environment on the implementation of a real-life computer science or computer engineering project.

2. Implementation of the 'Internship Project' course

The following steps will be carried out during the implementation of both CSC418 / ECE418 courses:

Step 1: Interested companies submit an internship project proposal using the form provided in Appendix A of this document (available also in electronic format)

Step 2: Any internship project submitted will be reviewed by the instructor responsible for the implementation of the course. The instructor might request clarifications / modifications from the company's project "mentor". Once accepted and finalized, the internship project will be added to the list of available internship projects of the Department of Computer Science & Engineering. The list will be available through the Departmental electronic facilities.

Step 3: Students will express their interest in implementing an internship project by sending an e-mail application, with their CV attached to the course instructor. The instructor will evaluate the applications on a first-come, first-served basis. The instructor will decide on the allocation of an internship project to a particular student based on the following criteria:

i) The student's GPA
ii) The student's performance on the courses relevant to the required skills for the project considered
iii) The student's non-academic experience on the required skills for the project considered
iv) The student's soft skills

The instructor and / or the company might request to interview the student prior to her / his appointment for the project. The instructor might also discuss the suitability of a particular student's profile with the company's "mentor".

Step 4: Each project will have two "mentors": the internal one (the course instructor), and the external one (a company's employee). They will be jointly responsible for the administration of the project.

Step 5: Once a project has been allocated to a student, a contract will be prepared and signed by all interested parties (the student, the course instructor, and a company's representative).

Step 6: The student will enroll to the course and will initiate her / his project work within the industrial environment.

Step 7: Within one month from the completion of the internship project, the student will submit a short report (Appendix B) to the internal 'mentor' concerning the implementation of the internship project, and the timesheets of his work in the company (based on the timesheets' format used by the company) signed by the external project 'mentor. The company's mentor will also submit a short report regarding the internship project (Appendix C). The internal mentor will assign a grade to the student based on both project reports. The grade assignment procedure is explained in Appendix D of this document.

3. Rules & Regulations

i) Students will be working **solely** for the purpose of the project implementation according to the **schedule** and the **work plan** described in the agreement between the "mentors" and the student. Any additional work requested from the student by the company, for purposes outside the implementation of the internship project, will have to be jointly agreed by the "mentors" and the student. This work should not interfere in any way with the implementation of the project agreed between all interested parties.

ii) Internship projects can be initiated at any moment in time. The Department will 'open' the course registration process for the first student undertaking the internship project course per semester.

iii) Students will be allocated an 'I' grade if the project's ending date (+1 month for the project report) will not coincide with the regular semester ending period.

iv) The student will only be allocated a grade if she / he submits the internship project report within a month from the internship's ending date (as this has been agreed in the contract).

Appendix A: Internship Project Proposal Form

Section	Description
Project Title	
Time Period / Duration	*400 hours minimum duration*
Project Start Date	*Type 'Any' if there exist no time constraints for the project start date*
Draft work plan & schedule of implementation	*In the form:* *Activity 1 / Time Period / Expected Workload / Expected Deliverable(s)* *.....* *.....* *Activity n / Time Period / Expected Workload Expected Deliverable(s)*
Skills required or preferred	
Special Requirements	
Contact details of the project "mentor"	

Appendix B: Student's Internship Project Report Template

Section	Description
Introduction	*Provide a short description of the document and its contents* *(1 page)*
Project Description	*Describe the aim and the objectives of the project implemented* *(1-2 pages)*
Work Accomplished	*Describe the work which was accomplished during the implementation of the project. This description should follow the project activities as these had been outlined in the project's contract.* *(2-4 pages)*
Exploitation of existing knowledge	*Describe the type of existing knowledge (gained through University courses) which was exploited during the implementation of the project, and the way in which it was exploited* *(1-2 pages)*
Knowledge gained	*Describe any new knowledge acquired during the implementation of the project* *(1-2 pages)*
Conclusions	*Provide a summary of the project implemented and its main results* *(1 page)*
Appendix A: Special Issues (optional)	*Describe the administrative problems faced during the implementation of the project (if any)*
Appendix B: Feedback / Suggestions (optional)	*Provide a qualitative evaluation of your internship project experience and suggestions for the improvement of its implementation*

Appendix D: Project's Evaluation Form (External Mentor)

Section	Description
Project Title	*As in project proposal form (Appendix A)*
Time Period / Duration	*As in project proposal form (Appendix A)*
Work plan & schedule of implementation (planned)	*As in project proposal form (Appendix A)*
Work plan & schedule of implementation (actual)	*Describe any differences either in the activities implemented or in the schedule of the project's implementation. Provide a short justification for any these differences*
Student's Evaluation	*Provide your evaluation of the student's performance during the implementation of the project. The evaluation should contain the following sections:* *i) Technical (ability of the student to implement the project's technical tasks)* *ii) Communication & Soft Skills (ability of the student to operate and communicate smoothly within the company's environment)* *(1-2 pages)*
Contact details of the project "mentor"	

Appendix E: Project's Evaluation Form (Internal Mentor)

Section	Description
Project Title	*As in project proposal form* *(Appendix A)*
Time Period / Duration	*As in project proposal form* *(Appendix A)*
Work plan & schedule of implementation (planned)	*As in project proposal form* *(Appendix A)*
Work plan & schedule of implementation (actual)	*Describe any differences either in the activities implemented or in the schedule of the project's implementation. Provide a short justification for any these differences* *(Appendix C)*
Student's Evaluation	*Provide your evaluation of the student's performance during the implementation of the project. The evaluation should contain the following sections:* *i) Technical (ability of the student to implement the project's technical tasks)* *(from Appendices B & C, 65% of the final grade)* *ii) Communication & Soft Skills (ability of the student to operate and communicate smoothly within the company's environment)* *(from Appendices B & C, 25% of the final grade)* *iii) Project report* *(from Appendix B, 10% of the final grade)* *(1-2 pages)*

European University Cyprus

Questionnaire

"STUDENTS' FEEDBACK ON THEIR LEARNING EXPERIENCE"

(Conventional Programs of Study)

Dear Students,

The main goal of European University Cyprus is to offer quality academic programs tailored to your needs so that we meet all conditions for acquiring the necessary knowledge and skills, as set out in each program. In this context, we ask for your help and cooperation in evaluating your whole experience in relation to the course you are taking during the current academic semester.

Completing this confidential questionnaire is very important as it gathers useful information for the best possible course design and delivery. Of particular value are the comments that you can include at the end of the questionnaire. Therefore, please take a few minutes to answer the open-ended questions in the last section.

It takes no more than 15 minutes to complete the questionnaire.

Thank you for your participation.

Section Q

Please indicate your answer by ticking (√) the relevant box:

Q1: What is the mode with which you attend this course F2020 semester:

1. Fully online □
2. Blended (some sessions online and some face-to-face on campus) □
3. Fully face-to-face on-campus □
4. Mixed modalities according to the COVID-19 conditions (i.e. it started in one way and during the semester it changed) □

Thinking of your overall educational experience at European University Cyprus during Fall 2020 Semester:

Q2: How satisfied are you in **general**?

Very Dissatisfied 1	Rather Dissatisfied 2	Neutral 3	Quite Satisfied 4	Very Satisfied 5

European University Cyprus

Q3: a. To what extend do the following statements apply to you on a scale of 0 to 10 (0= Not at all satisfied at All and 10= Completely Satisfied)? OR tick (√) the last column in case it did not apply to you.

	0 =Not at All Satisfied				10 = Completely Satisfied	I DID NOT NEED TO COMMUNICATE WITH
1. I am satisfied with my communication with the administrative personnel of my School						.....
2. I am satisfied with my communication with the course coordinator of my program of studies						.....
3. I am satisfied with my communication with my Student Advisor						.....
4. I am satisfied with the support that I receive from the MIS department (IT Support) of the University						.....

b. And to what extend do the following statements apply to you on a scale of 0 to 10 (0= Not at all satisfied and 10= Applies Completely)?

	0 =Not at All Satisfied				10 = Completely Satisfied
5. I am satisfied with the operation of the Blackboard learning platform (for those who had their classes on Blackboard Learn)					
6. I am satisfied with the operation of the Moodle Learning platform (for those who had their classes on Moodle)					
7. I am satisfied with the tools of the Blackboard learning platform (for those who had their classes on Blackboard Learn)					
8. I am satisfied with the tools of the Moodle Learning platform (for those who had their classes on Moodle)					
9. I am satisfied with the teleconferencing system Blackboard Collaborate					

European University Cyprus

Thinking of this particular course:

Q4: How satisfied are you in relation to **the information** that was provided to you by the University regarding **the mode of delivering of <u>this course</u>** during Fall Semester 2020?

Very Dissatisfied 1	Rather Dissatisfied 2	Neutral 3	Quite Satisfied 4	Very Satisfied 5

Q5: How satisfied are you in relation to **guidance** provided by your instructor regarding the **delivery of <u>this course</u>** during Fall Semester 2020?

Very Dissatisfied 1	Rather Dissatisfied 2	Neutral 3	Quite Satisfied 4	Very Satisfied 5

European University Cyprus

Section A. To what extend do the following statements apply to you on a scale of 0 to 10 (0= Does Not Apply at All and 10= Applies Completely)					
	0 =Does Not Apply at All				10 = Applies Completely
1. The instructor clearly explains the course outline at the beginning of the course (e.g. learning outcomes, weekly material, examinations, grading)					
2. The instructor prepares and organizes the class in a way that facilitates learning					
3. The instructor teaches the course material/content in a clear way					
4. The instructor teaches the course in an interesting way					
5. The instructor is prepared for every class					
6. The instructor seems enthusiastic and enjoys teaching this course					
7. The course learning outcomes and objectives (as stated in the course outline) are met					
8. The course reading materials (books, articles, handouts) are useful					
9. The instructor uses a variety of teaching methods (e.g. group discussions, student presentations, case studies, etc.) to support the learning process					
10. The material and means of teaching (e.g. books, lecture notes, PowerPoint, videos, etc.) are suitable, useful, supportive and up-to-date					
11. The instructor often makes use of technology in his/her teaching					
12. The activities I participated in, were suitable in meeting the course objectives					
13. The instructor encourages students to ask questions and participate in discussion					
14. The assignments I completed, were suitable for the course objectives					
15. The instructor is available and willing to support students (e.g. during office hours, via email, etc.)					
16. The instructor keeps control of the class during the teaching session					
17. The assessment of course assignments and activities is conducted by the instructor in an objective manner					
18. The feedback provided by the instructor (e.g. corrections, comments, etc.) is constructive and helps me to improve my learning process					

19. The instructor is on time for the beginning and the ending of the class					
20. I find the Instructor's attitude towards students respectful and polite					
21. I find that the instructor demonstrated professionalism in interactions with me and/ or other students					
22. I find that the instructor shows genuine concern for my learning					
23. I would take classes from this instructor again					
Section B. To what extend do the following statements apply to you on a scale of 0 to 10 (0= Does not Apply at All and 10= Applies Completely)					
	0 =Does Not Apply at All				**10 = Applies Completely**
1. The course content meets my expectations					
2. The course contributed to the development of my ability to think critically					
3. The course provides guidance on how I can develop professional competencies					
4. The course helped me develop abilities and skills related to my program of study and/or my broader education					
The following two questions should be answered only for the <u>practical/lab courses</u>:					
5. The practical/lab sessions correspond to the theoretical content of the course					
6. Students are often provided with the opportunity to work on practical/lab activities throughout the course					

European University Cyprus

Section C. Please respond to the following open-ended questions:
1. Write down one or two positive characteristics of the course
2. Suggest one or two changes for the improvement of the specific course
3. Write down one or two positive characteristics of the instructor of this course
4. Suggest one or two ways that the instructor of this course can improve his/her teaching
5. General comments-suggestions-observations (here you can mention anything you consider important about the course that, in your opinion, the questionnaire does not sufficiently cover)
The following two questions must be answered only for courses with <u>practical/lab sessions</u>
6. In your opinion, is the duration of the practical/lab sessions and the number of instructors sufficient/adequate?
7. In your opinion, is the equipment available for the practical/lab sessions sufficient/adequate?

APPENDIX 8

An example of the data that are reviewed by Departments

F2020

School of Sciences

Department of Computer Science and Engineering

Computer Engineering Program

Student Feedback on their Learning Experience

QUESTION	Average score
1. Enrolled students per course (average class size)	14
2. Responded to the survey (average)	8
1a. Enrolled students (%)	96.7%
2a. Responded to the survey (%)	53.1%
Q2: How satisfied are you in general? (1-5)	3.7
Q3a.1. I am satisfied with my communication with the administrative personnel of my School (0-10)	7.6
Q3a.2. I am satisfied with my communication with the course coordinator of my program of studies	7.9
Q3a.3. I am satisfied with my communication with my Student Advisor	8.1
Q3a.4. I am satisfied with the support that I receive from the MIS department (IT Support) of the University	7.6
I am satisfied with the operation:	
Q3b.5. of the Blackboard learning platform (for those who had their classes on Blackboard Learn)	7.9
Q3b.6. of the Moodle Learning platform (for those who had their classes on Moodle)	8.0
I am satisfied with the tools:	
Q3b.7. of the Blackboard learning platform (for those who had their classes on Blackboard Learn)	7.9
Q3b.8. of the Moodle Learning platform (for those who had their classes on Moodle)	7.9
Q3b.9. I am satisfied with the teleconferencing system Blackboard Collaborate	7.9
Q4: How satisfied are you in relation to the information that was provided to you by the University regarding the mode of delivering of this course during Fall Semester 2020? (1-5)	3.9
Q5: How satisfied are you in relation to guidance provided by your instructor regarding the delivery of this course during Fall Semester 2020? (1-5)	4.0
Instructor	

APPENDIX 8

1. The instructor clearly explains the course outline at the beginning of the course (e.g. learning outcomes, weekly material, examinations, grading)	8.4
2. The instructor prepares and organizes the class in a way that facilitates learning	8.2
3. The instructor teaches the course material/content in a clear way	8.0
4. The instructor teaches the course in an interesting way	7.7
5. The instructor is prepared for every class	8.3
6. The instructor seems enthusiastic and enjoys teaching this course	8.3
7. The course learning outcomes and objectives (as stated in the course outline) are met	8.2
8. The course reading materials (books, articles, handouts) are useful	8.0
9. The instructor uses a variety of teaching methods (e.g. group discussions, student presentations, case studies, etc.) to support the learning process	7.7
10. The material and means of teaching (e.g. books, lecture notes, PowerPoint, videos, etc.) are suitable, useful, supportive and up-to-date	8.2
11. The instructor often makes use of technology in his/her teaching	8.5
12. The activities I participated in, were suitable in meeting the course objectives	8.1
13. The instructor encourages students to ask questions and participate in discussion	8.5
14. The assignments I completed, were suitable for the course objectives	8.2
15. The instructor is available and willing to support students (e.g. during office hours, via email, etc.)	8.5
16. The instructor keeps control of the class during the teaching session	8.7
17. The assessment of course assignments and activities is conducted by the instructor in an objective manner	8.3
18. The feedback provided by the instructor (e.g. corrections, comments, etc.) is constructive and helps me to improve my learning process	7.9
19. The instructor is on time for the beginning and the ending of the class	8.5
20. I find the Instructor's attitude towards students respectful and polite	8.4
21. I find that the instructor demonstrated professionalism in interactions with me and/ or other students	8.4
22. I find that the instructor shows genuine concern for my learning	8.3
23. I would take classes from this instructor again	7.5
Course	
1. The course content meets my expectations	8.0

APPENDIX 8

2. The course contributed to the development of my ability to think critically	7.6
3. The course provides guidance on how I can develop professional competencies	7.7
4. The course helped me develop abilities and skills related to my program of study and/or my broader education	7.7
5. The practical/lab sessions correspond to the theoretical content of the course	7.2
6. Students are often provided with the opportunity to work on practical/lab activities throughout the course	6.8

STRATEGIC OBJECTIVE ENGAGEMENT
The School Academic Plan Strategy (SAPS)
THE SCHOOL OF SCIENCES

1. Mission – Vision – Values

Mission:

- Provide high quality education using student-centered teaching methods and utilizing state-of-the-art equipment and facilities to enhance students' learning outcomes and create an environment of continuous personal and professional development.

- Prepare graduates for successful employment opportunities and further post-graduate and/or doctoral studies.

- Aspire to become a leading research institution. Invest in research to advance knowledge in a variety of scientific fields and promote interdisciplinary cooperation under the school's umbrella.

- Become a pillar of community and social responsibility. Engage in community participation to promote knowledge, ethics and science and change people's lives.

- Lead by example and inspire continuous improvement in educational, clinical, research and social participation.

1. Mission – Vision – Values

Vision:

Attain and maintain leadership, locally and regionally, in top-quality education with remarkable research output and community outreach activities beneficial to the society.

1. Mission – Vision – Values

Values:

Strive for Excellence in Education and Research

Cultivate professionalism

Innovate in Science

Experiment with ethos and open mind

Novelty in teaching and research

Care for people

Educate with integrity and passion

Social and Environmental responsibility

STRATEGIC OBJECTIVE ENGAGEMENT
The School Academic Plan Strategy (SAPS)

1.1. Priorities

1.1.1. Immediate Priorities

1.1.1.1. Finalize Departmental and Programmatic Accreditations by CYQAA

1.1.1.2. Introduction of new programs of study e.g. in Speech and Language Pathology, Blockchain, Occupational Therapy etc.

1.1.1.3. Targeted faculty additions to deepen academic expertise and to allow sustainable growth

1.1.1.4. Enrich and strengthen student recruitment Policies – Reinforce current Marketing approaches

1.1.1.5. Development of student management plans (academic engagement, monitoring, and tutoring activities, from the 1st year of study, implementation of low GPA policy)

1.1.1.6. Strategic engagement of programs with industry and society to promote School's brand name

1.1.1.7. Further enhance student employability

1.1.1.8. Support initiatives to create Research Centers in specific research areas to further enhance research collaboration, funding and publication output.

1.1. Priorities

1.1.2. Short-Term Priorities

1.1.2.1. Completion of Institutional, Departmental and programmatic accreditation process by CYQAA

1.1.2.2. Development and improvement of short and long-term Marketing plans per Program of Study and maintain communication with the Department of Marketing

1.1.2.3. Strengthening of capacity for the accommodation of enrollment growth and external accreditation activities (faculty hiring / infrastructure development)

1.1.2.4 Introduce a postgraduate scholarship scheme as well as endowed scholarships for our students, especially women and minorities in collaboration with the Department of Enrolment

1.1.2.5 Review and improve the current part-time instructor scheme of cooperation

1.1.2.6. Development of additional English-speaking programs for attracting international audience

1.1.2.7. Offer more programs in flexible format (distance learning)

1.1.2.8. Creation of additional research centers i.e. Basic and Translational Cancer Research Center and/or Exercise and Nutrition Center, for promoting interdisciplinary research and attract funding

1.1.2.9. Complete the submission of new MSc and PhD Programs of study for accreditation

1.1. Priorities

1.1.3. Long-Term Priorities

1.1.3.1. Become one of the best and most comprehensive School of Sciences in Cyprus and the region

1.1.3.2. Strengthening of Research Capacity and Output (establishment of new research centers, merging / collaboration of existing research centers to establish Centers of Excellence, talented faculty hiring with research potential, research infrastructure development, development of new PhD Programs, scholarships for PhD students, mentoring PhD students for a successful career)

1.1.3.3. Increase significantly the number of students, faculty and staff

1.1.3.4. Maintain and improve the engagement and working environment for full-time faculty

1.1.3.5. Assign and Monitor Quality Indicators within the Functions and Activities of the School

1.1.3.6 Strengthen relationship with the large numbers of part-time staff working for the School (teaching / research / administration) through a more "permanent" and hence a more engaging contract.

1.1.3.7. Development of a joint multidisciplinary independent applied research unit

1.1.3.8. Offer joint degrees with other universities in Greece, Europe and internationally.

1.1.3.9 Become a key player in interventions aiming to solve societal weaknesses and problems

1.1.3.9 Establish a better communication with graduates

1.1.3.10 Enrich and strengthen engagement with industry and society

2. Research and Creative Activities

2.1. Goal: Establish new laboratory facilities for research

Commitment:

2.1.1. EUC to provide basic equipment and space

2.1.2. Additional equipment will be obtained via research proposal / sponsorship

Indicators and success: Establishment of 1-2 new research laboratories.

Supporting Actions: Proposals / seek external funding

2.2. Goal: Increased Engagement of Students in Research Activities

Commitment:

2.2.1. Offering student-focused research opportunities established by Research Labs and Centers

Indicators and success: Number of completed research Thesis projects and publications by under- or post-graduate students

Supporting Actions: Small budget or stipend available for students to support their research activities. This scheme could also be linked to the provision of scholarships and to internship courses.

2. Research and Creative Activities

2.3. Goal: All faculty to participate in research activity.

Commitment:

2.3.1. Support and invest in faculty in their efforts to increase research activities

Indicators and success: 1) Submission of research proposals and participation in funded research projects 2) Publication in peer-review conferences and journals

Supporting Actions: 1) Implementation of research policy for teaching hour reduction

2) Provide financial support to faculty in order to attend/participate in international scientific events, such as conferences, networking events, trainings, visits to other collaborators in order to increase their knowledge capacity and promote scientific collaboration

2.4. Goal: (creative activity) Computerize administrative processes
Commitment:

2.4.1. Reduce administrative load of academic and administrative personnel by introducing computerized processes

Indicators and success: Implementation of automated grade submission and validation procedures
Generation of annual monitoring report for students and programs

Supporting Actions: The HR Department to exploit online platforms (e.g. Workday) to manage online and automated application process
Introduction through the new DoE software system

2. Research and Creative Activities

2.5. Goal: Improved Research output

Commitment:

2.5.1. Increase Scopus peer-reviewed publications per faculty per year

2.5.2. Increase presentations in national/global conferences per faculty per year

2.5.3. Establishment of new multidisciplinary Research Centers in School

Indicators and success: Research funding income,, publications and citations per faculty, increment of international visibility, University rankings and ratings

Supporting Actions: 1) Increase funding for research

2) Increase School's budget for journal publication fees

3) Further support Research Centers in terms of infrastructure, internal funding, research staff and scholarships.

4) Hiring of new research-oriented full-time faculty

2.6. Goal: Establish additional dedicated Research Laboratories

Commitment:

2.6.1. Preparation and submission of a complete plan for the establishment of additional research laboratories

2.6.2. Monitor and supervise the process to ensure timely completion of the project

Indicators and success: Completion of additional research laboratories

Supporting Actions: Submission of grant proposals and acquisition of external funding for research equipment/consumables/salaries

Approval of allocated budget for the establishment of new research labs

STRATEGIC OBJECTIVE ENGAGEMENT
The School Academic Plan Strategy (SAPS)

3. Education / Teaching

3.1. Goal: Achieve Educational Excellence

Commitment:

3.1.1. Implementation of Digital Enhanced Learning methodologies

3.1.2. Promote experiential student learning

Indicators and success: Success defined as increase in Faculty performance evaluation by students, increase in class attendance, retention and graduation rates

Supporting Actions: 1) Improvement of the platform for increased student feedback participation
2) Train faculty in digital enhanced learning technologies
3) Accordingly adjust course content and learning activities

3.2. Goal: Improve Student Satisfaction

Commitment:
3.2.1. Promote students' class involvement and interaction with peers and instructor.

3.2.2. Motivate students to participate in course evaluation

3.2.3. Encourage students to resolve daily issues with instructors

Indicators and success: Success defined as increase in Faculty performance evaluation by students and reduce number of grievance committees indicating poor performance/misconduct, Student Satisfaction Index and rating/ranking of organizations

Supporting Actions: 1) Improvement of the platform and procedures for increased student feedback participation
2) Encourage student teamwork peer-teaching activities

STRATEGIC OBJECTIVE ENGAGEMENT
The School Academic Plan Strategy (SAPS)

3. Education / Teaching

3.3. Goal: Increase retention rates of 1st-year (freshmen) students

Commitment:

3.3.1 (One) 1 faculty meeting with all freshmen per program of study per year

3.3.2. Appropriate actions and monitoring for students with low GPAs (Low GPA Policy)

Indicators and success: Decrease drop-out (attrition) rates

Supporting Actions: Detailed information about freshmen performance provided by the Enrolment Dept
Communication of student advisors with faculty

3.4. Goal: Introduce peer-student supporting activities with the aid of high-ranking students

Commitment:

3.4.1. Hire final-year or post-graduate students as teaching assistants.

Indicators and success: Higher student grades, fewer student failures

Supporting Actions: Allocation of budget to support teaching assistants

3. Education / Teaching

3.5. Goal: Improve teaching skills of faculty

Commitment:

3.5.1. Support and motivate the attendance in faculty development seminars/trainings in order to enrich their teaching material, methodology and tools**.**

Indicators and success:

1) Increase of students' GPA and grades at the courses they attend
2) Increase of students learning experience and satisfaction

Supporting Actions:

1) Financial support of faculty to attend seminars/trainings in order to enrich the teaching material, methodology and tools utilized in the courses they teach
2) Provide interesting and up-to-date faculty development seminars by the university

STRATEGIC OBJECTIVE ENGAGEMENT
The School Academic Plan Strategy (SAPS)

4. Widening Engagement and Reputation

4.1. <u>Goal:</u> Increased participation of students in local and international competitions in the corresponding thematic areas per Program of Study

Commitment:
4.1.1. Students participation in events, competitions, widening activities etc.

Indicators and success: At least 5 students per year in corresponding thematic areas, participating in local and international events

Supporting Actions: Budget available for the participation of students in these events

4. Widening Engagement and Reputation

4.2. <u>Goal:</u> Faculty actively involved in scientific, outreach and other activities promoting science, locally and worldwide

Commitment:

4.2.1. Faculty participation in scientific, outreach and other activities, such as conferences/workshops and summer school organizations

4.2.2. Synergy with the Marketing Department to promote outreach activities

Indicators and success:

1) Organization of at least one international conference every 2-3 years per department
2) Organization of at least one big outreach activity per year per department
3) Organization of at least one summer school every 2-3 years per department (where applicable)

Supporting Actions: Financial and time support of the faculty to participate in these kind of activities

4. Widening Engagement and Reputation

4.3. Goal: Developing a profile of Sustainable Corporate Social Responsibility

Commitment:

4.3.1. Enhance School's brand name

4.3.2. Build trust between faculty, students and society

Indicators and success: Success defined as increase in public interest and interaction with social bodies.

Supporting Actions: 1) A minimum of one high-impact event for society/general public per program per year

2) A minimum of one open day/promotional event per thematic area per year

3) Approval of pertinent budget

4.4. Goal: Engagement with Industry and Society

Commitment:

4.4.1. Establishment of MoUs and agreements with Social bodies, organizations of public benefit, local Industry and professional bodies

4.4.2. Implementation of outreach activities and improve community awareness, health and well-being

Indicators and success: Success defined as increase in established MoUs and collaborations. Number of outreach activities. Improvement of social recognition.

Supporting Actions: 1) Maintain and strengthen communication current Industrial Advisory Board members.
2) Develop contact network within Industry and Society
3) Approval of pertinent budget for outreach activities

5. Academic Personnel (Faculty, Staff etc.)

5.1. Goal: Continuous and sustainable faculty development

Commitment:

5.1.1. Promote participation of full-time and part-time faculty in faculty development programs

5.1.2. Encourage faculty to participate in international conferences, seminars and workshops

5.1.3. Encourage faculty to register and participate in internationally-recognized professional organizations

Indicators and success: Success defined as increased percentage of faculty within goal

Supporting actions: 1) Allocate increased budget for individual faculty development schemes and memberships
2) Organization of new faculty development programs, such as in digital enhanced learning teaching methodologies

5.2. Goal: Increase employee satisfaction

Commitment:

5.2.1. Improve working conditions and environment within School and introduce faculty recognition schemes and practices
5.2.2. Enhance team spirit and synergy between colleagues

Indicators and success: Self-evaluation reports showing increased average employee satisfaction

Supporting actions: 1) Decrease administrative workload of faculty
2) Implement more efficient working practices in collaboration with HR Department
2) Organize off-work activities to enhance bonding between employees

5. Academic Personnel (Faculty, Staff etc.)

5.3. Goal: Recruitment of Additional Faculty Members

Commitment:

5.3.1. Hire new full-time faculty to support current and future programs of study and to deepen academic expertise

Indicators and success: Increase in permanent faculty to student ratio as well as full-time to part-time faculty ratio

Supporting actions: 1) Approval of pertinent budget in Human Resource department

2) Permanent faculty to student ratio as well as full-time to part-time faculty ratio should be assigned as quality indicators

STRATEGIC OBJECTIVE ENGAGEMENT
The School Academic Plan Strategy (SAPS)

6. Growth / Development

6.1. Goal: Continuous development in response to changing societal needs and competition

Commitment:

6.1.1. Developing / reviewing / updating programs on a continuous basis and based on needs assessments

6.1.2. Increase hirings to retain and optimal ratio of administrators:full time faculty:students

Indicators and success: Success defined as increased percentage of sustainable and successful programs

Supporting Actions: 1) Approval of relevant actions by Senate / HR Department
2) Allocation of pertinent hiring budget from Human Resource department

6.2. Goal: Departmental/School Growth

Commitment:

6.2.1. Increase in number of full time academic and administrative staff

6.2.2. Establishment of new programs of study in cutting-edge fields

6.2.3. Increase in total number of enrolled students, international students, talented students, and minorities

Indicators and success: Success defined as increase in in full-time personnel, students and launching of new programs

Supporting Actions: 1) Promote differential growth strategies
2) Strategic recruitment of high-level new faculty and talented students
3) Establish new programs which are unique in Cyprus and wider region

6. Growth / Development

6.3. Goal: Increase student enrollment

Commitment:

6.3.1. Increase in total number of enrolled students

6.3.2. Encourage faculty to attend, along with marketing personnel, at National/International promotional events for School's programs of study.

6.3.3. Reinforce current marketing approaches by strengthening collaboration of academic with marketing personnel.
Indicators and success: Success defined as yearly increase in student enrollment

Supporting Actions: 1) Approval of pertinent financial support for faculty
2) Promote competitive advantages of our programs as well as programs (preferably in English) which are unique in Cyprus and wider region

6.4. Goal: Increase engagement of faculty with students

Commitment:

6.4.1. Encourage faculty and staff interaction

6.4.2. Enhance coupling of teaching with research activities under the supervision of academic instructors

6.4.3. Encourage students to meet faculty during office hours
Indicators and success: Success defined as improved engagement of faculty with students.

Supporting Actions: 1) Faculty availability and willingness to meet students
2) Development of faculty-student synergies in teaching and research
3) Organize bonding events between faculty and students where we will engage students and enhance their sense of belonging to both the department and the university

STRATEGIC OBJECTIVE ENGAGEMENT
The School Academic Plan Strategy (SAPS)

7. Student Success and Academic Excellence

7.1. Goal: Pursuing individualized student success and satisfaction

Commitment:

7.1.1. Limitation of student withdrawals / drop-outs per course per year

7.1.2. Limitation of student failure per course from semester 2 and onwards

7.1.3. Further support performance of exceptional students

Indicators and success: Success defined as yearly decrease in student drop-out/failure rates and further improvement in top student performance

Supporting Actions: 1) Closely monitor progress of students with low GPA and implement specific actions during semesters to improve their performance
2) Engage exceptional students in peer-teaching activities
3) Use of MSc and PhD students as teaching assistants for undergraduates
4) Involve MSc and PhD students in ongoing research projects

7. Student Success and Academic Excellence

7.2. Goal: Increase graduate student employability success by familiarizing them with the currently used technologies.

Commitment:

7.2.1. Further improve student practical placement schemes by establishing additional agreements with industrial partners

7.2.2. Digital enhanced learning teaching methodologies to be incorporated in conventional courses

7.2.3. Faculty to become aware of more practical aspects of digital enhanced learning methodologies

Indicators and success: Increase in percentage of graduates' employability

Supporting Actions: 1) Training of faculty in digital enhanced learning technological tools and industrial applications in order to incorporate them in their courses.
2) Targeted internships in industry and job market for students giving practical knowledge, experience and creating market network.

Appendix 10

EUC Promotion Criteria and Procedure

Faculty member hired through the faculty selection and appointment procedure must complete at least three (3) years of service to the appointed rank, in order to be eligible for promotion; provided that he/she meets all other criteria for promotion.

Promotion Criteria

Advancement in rank shall depend upon the faculty member meeting the six criteria listed below:

1. Fulfilment of the minimal criteria for appointment to rank.
2. Positive and substantial evidence of high competency in teaching.
3. Evidence of positive contribution(s) to the overall development of the individual's program area and Department.
4. Evidence of service to the University and Community in general.
5. Membership and participation in professional or learned societies of national or international significance.
6. Research and scholarly publications or recognized creative work in the individual's field.

Documentation Accompanying the Application for Promotion

To be considered for advancement in rank, the applicant must:

- Demonstrate fulfilment of the minimal criteria for appointment to rank.
- Show positive and substantial evidence of high competency in teaching by submitting all the following:
    - Student ratings (in summary form) of Teacher and Course Evaluations during the years immediately preceding application, since the beginning of employment or the last promotion;
    - Analysis of grades submitted by the applicant during the years immediately preceding the application, since the beginning of employment or the last promotion;
    - Self-evaluation of the applicant's teaching methods/ techniques;
    - Peer Reviews from classroom observations during the years immediately preceding the application, since the beginning of employment or the last promotion, are strongly recommended.
    - Certificates and documentation of attendance in instructor teaching training programs/seminars; organized by the University or any other institution/carrier during the years immediately preceding application, since the beginning of employment or the last promotion;
- Show evidence of positive contribution(s) to the overall development of the individual's program area and Department.
- Show evidence of service to the University and Community in general.

- Show evidence of membership and participation in professional or learned societies of national or international significance.
- Show evidence of research and scholarly publications or recognized creative work in the individual's field (see below framework of minimum suggested/expected requirements in Research and Scholarly Publications and/or recognized creative work for Faculty Ranking):

	FOR ALL ACADEMIC DEPARTMENTS
LECTURER TO ASSISTANT PROFESSOR	• Substantial record of presentations at professional, peer-reviewed national and international conferences. • Substantial record of output in the form of articles in international refereed journals, and / or (in appropriate areas) books, book chapters. • Strong participation in externally funded, peer reviewed research grant (s) or research project (s). • Evidence of contribution to the international research community as this is indicated by reviewing duties in international peer-reviewed journals or in scientific committee of national and international conferences.
ASSISTANT PROFESSOR TO ASSOCIATE PROFESSOR	• Substantial record of presentations at professional, peer-reviewed national and international conferences. • Substantial record of output in the form of articles in international refereed journals, and / or (in appropriate areas) books, book chapters. • Evidence of substantial research impact on an international level, as this is indicated by citation impact analysis or other means relevant to the specific areas of research • Capacity in achieving research funding as this is indicated by (any or all): o Participation in externally funded, peer reviewed research grant (s) or research project (s). o Participation in externally funded, international research networks. o Development, submission, management and coordination of externally funded, peer reviewed research grant (s) or research project (s) • Substantial record of student project supervisions on both graduate and postgraduate level

	• Strong evidence of contribution to international research community as this is indicated by: o Reviewing duties in international peer-reviewed journals or in scientific committee of national and international conferences o Membership of the editorial board in refereed international journals
ASSOCIATE PROFESSOR TO PROFESSOR	• Substantial record of presentations at professional, peer-reviewed national and international conferences. • Substantial record of output in the form of articles in international refereed journals, and / or (in appropriate areas) books, book chapters. • Evidence of substantial research impact on an international level, as this is indicated by: o Citation impact analysis or other means relevant to the specific areas of research o Research awards and prizes (including elected fellowships) o Invitations to participate as a speaker in international research meetings, workshops, and conferences o Translation(s) of the applicant's research work • Strong evidence of leadership in achieving research funding as this is indicated by: o Substantial record of participation in externally funded, peer reviewed research grant (s) or research project (s). o Substantial record of participation in externally funded, international research networks. o Substantial record of development, submission, management and coordination of externally funded, peer reviewed research grant (s) or research project (s) • Substantial record of research supervisory work, as this is indicated by: o Student project or thesis supervisions on taught undergraduate and postgraduate level o Supervision of doctorate-level candidates • Strong evidence of contribution to the international research community as this is indicated by (any or all): o Reviewing duties in international peer-reviewed journals and books in publishing houses

	o Reviewing duties in international research-funding organizations o Membership of the editorial board in refereed international journals o Chairing of international peer-reviewed conferences or serving in national and international conferences' scientific committees • Strong evidence (as appropriate to the discipline) of significant impact of research transfer / exchange on practice, quality of life or wider social or cultural issues through ongoing engagement with communities or/and stakeholders, as this can be indicated by: o Application of research findings to improve the performance of public organizations e.g., by informing public policy, government, or by engaging with the heritage or cultural sector, development of standards and procedures, etc. o Application of knowledge to improve the performance of business, commerce or industry, through consultancy, inventions, intellectual property (patent applications, provisional patents, or patents awarded), and spin-off companies

The procedure for Promotion:

Faculty Members who consider themselves eligible for promotion have the responsibility to submit their application to the Dean of their School, whilst informing the Chairperson of the pertinent Department by October 31st. In the case that the applicant is the Dean of the School, then he/she must submit his/hers application to the Vice-Rector of Academic Affairs (who initiates the rest of the procedure).
In order for an applicant to be considered eligible for promotion, all of the criteria for appointment to the rank must have been completed, prior to the October 31st deadline. Applications received after the above deadline shall not be reviewed for that academic year.
The Committee on Promotion shall review all requests for promotion and make its recommendations in accordance with the procedures detailed in the Charter and are consistent with the Law. The Committee on Promotion has the responsibility to solicit the appropriate information in order to make recommendations for promotion with respect to the promotion criteria outlined above.

The Committee on Promotion shall consist of the following members (care of the Dean of the pertinent School):

o Two full-time Faculty members from each Department of the School.

- One representative Faculty member from each of the other Schools of the University.

All Committee members should hold a higher rank to the one the candidate is considered for, except for the rank of Professor, for which all members should hold the rank of Professor. In the case that the conditions in a School are such, where there are not faculty members available in a higher rank, then the Committee can be constituted by additional Faculty members of another Department/School in a higher rank. In the case that the above provisions are not possible, the Committee can also consist of pertinent Department/School members in an equal, to the one the candidate is considered for, rank. A voting right reserve only the members that are present during the meetings of the Committee on Promotion.

A quorum shall consist of two-thirds of the voting members. Each eligible member shall have one vote in Committee meetings and Committee elections. In case of a tie, the Chair of the Committee shall cast the winning vote. There shall be at least one external reviewer who is a full-time active academician in the discipline of the candidate, and who holds an academic rank higher or equal to the rank for which the faculty member is being considered. The external reviewer(s) shall not be co-author(s), nor shall he/she maintain a proved close relationship of any kind, or be a family member of the candidate. The Chair of the Committee is elected by the members at the first meeting of the Committee. The Dean of the School forwards the application and the candidate's academic portfolio to the Chair of the Committee on Promotion by November 15th. The Committee on Promotion prepares a list of prospective external reviewers and investigates whether the candidate holds a strong objection(s) towards any individual on the list serving as external reviewer; or whether any of the requirements that are being violated. Then the Committee on Promotion makes the final selection of an external reviewer.

The Chair of the Committee on Promotion forwards copies of the candidate's academic portfolio to all members of the Committee (including the external reviewers) within a week and arranges for a review meeting within forty-five (45) days from the day the Chair of the Committee received the application and the candidate's academic portfolio.

The final decision and report of the Committee on Promotion is forwarded by the Chair of the Committee to the Council of Department, via the Chairperson of Department, within two (2) weeks from the conclusion of the Committee's deliberations. The Council of the Department determines that all procedural guidelines have been properly followed, ensures that all appropriate criteria were satisfied and reaches to an appropriate decision.

The Chairperson of the Department forwards the decision of the Council of Department, the portfolio and the reports to the Council of School via the Dean of School, within a month from the date he/she receives the Committee's decision and accompanying material.

The Council of School reaches a decision after reviewing the decision of the Council of Department, the portfolio and the report of the Committee on Promotion and ensures that all appropriate criteria for promotion are satisfied and all procedures have been followed. The Dean of School then forwards the decision of the Council of School together with the decision

of the Council of Department, the portfolio and the report of the Committee on Promotion to the Senate, via the Rector, within a month from the date he/she receives the decision of the Council of Department and the accompanying material.

The Senate reaches a decision after reviewing the decision of the Council of School, the decision of the Council of Department, the portfolio and the report of the Committee on Promotion and ensures that all appropriate criteria for promotion are satisfied and all procedures have been followed.

The Rector then forwards the decision of the Senate, together with the decision of the Council of School, the decision of the Council of Department, the portfolio and the report of the Committee on Promotion, to the University Council via the President, within a month from the date he/she receives the decision of the Council of School and the accompanying material.

The Council, after examining the legality of the procedures followed in alignment to the Charter, the Internal Regulations and the relevant Laws, ratifies the decision.

The Dean of School and/or the Rector and/or the President may require from the Committee on Promotion further elaboration of specific issues/ areas of the application. The ratified final decision of the Council is communicated immediately to the pertinent Dean of School via the Rector.

The candidate (with copy to the pertinent Chairperson of Department) shall be informed immediately of the decision in writing by the Dean of the School.

The approved promotion becomes effective as of the date the promotion has been ratified by the Council.

European University Cyprus

INTERNAL REGULATION ON

RESEARCH POLICY

54th Senate Decision: 21 December 2017
60th Senate Decision: 2 October 2018
70th Senate Decision: 13 December 2019
80th Senate Decision: 28 January 2021

Table of Contents

Introduction

Within the framework of further contribution to the research community, the mission of the European University Cyprus (from now on referred to as the University or EUC) is to develop a pioneering and innovative research infrastructure with the objective of generating new knowledge. The university focuses on both fundamental and applied research and wherever possible the commercial application or exploitation of the research results.

The policy is guided by the following broad objectives:

1) The establishment of an interdisciplinary approach for researchers with attractive conditions for accessible movement among institutions, disciplines, sectors and countries, without financial and administrative obstacles.

2) The creation of state of the art research infrastructures, including research centres, foundations, units and/or laboratories, which are integrated and networked and accessible to research teams from across the EUC.

3) Introduction of a simple and harmonized regime for intellectual property rights in order to enhance the efficiency of knowledge transfer, in particular between public research and industry.

4) Optimization of research programs and priorities, for example by developing joint principles for the administration of European, national and regional funding programs.

5) The strengthening of international cooperation enabling faculty and other scholars in the world to participate in various research areas, with special emphasis on developing multilateral initiatives to address global challenges.

6) The transfer of research-based knowledge to EUC students

Research is conducted by faculty members, research associates/research personnel and PhD students either on their own or within the framework of external (national, European, international) and internal funding programs that are launched by the University.

The Research Policy provides a code of conduct for research and is intended for all staff, including people with honorary positions, faculty members, special teaching personnel, scientific collaborators, special scientists, research associates, and students carrying out research at or on behalf of the University.

All groups mentioned above must familiarize themselves with the Research Policy to ensure that its provisions are observed.

1. EUC Research Ethics Policy

1.1 Scope and Purpose

1. The aim of the EUC Research Ethics policy is to promote and encourage a high quality research and enterprise culture, with the highest possible standards of integrity and practice. The policy applies to all academic, contract research and administrative staff, all research students, as well as undergraduate and masters students who are undertaking research. In short, the policy applies to all disciplines and research activities within the University, or sub-contracted on its behalf.

2. All staff and students are expected to act ethically when engaged in University business. Any research involving animals, human participants, human tissue or the collection of data on individuals requires ethical consideration. While particular attention must be paid to the interests of potentially vulnerable groups, such as children, the University recognises that it has a duty of care towards all members of the wider community affected by its activities. The University also recognises that it has a duty of care to its own staff, and that this includes the avoidance of harm to those undertaking research.

3. The University will establish a framework for research ethics governance in which its Research Ethics Committee will have a central approval, monitoring and training role. The University will establish a Research Ethics Committee with representatives from all the Schools. The Research Ethics Committee will put in place the procedures needed to obtain approval.

   It is, however, recognised that it may not always be appropriate or practicable for ethical approval to be sought from the Research Ethics Committee especially when it comes to short or undergraduate projects. Normally undergraduate or taught projects will not require clearance from the Research Ethics Committee and the matter can be dealt with at School and/or Department level. However, when active intervention is involved whether physically invasive or psychologically intrusive the Research Ethics Committee will need to be consulted. In particular, university staff has an obligation to ensure that not only their own research but any undergraduate or masters student research conducted under their supervision is ethically sound. Where research projects are subject to external approval, the School or Department responsible must ensure that this approval is sought and given. Where approval for a project has been given by a Research Ethics Committee at another university, as may be the case with a collaborative project, the EUC Research Ethics Committee must be provided with proof of this.

4. For some research projects it may be necessary to obtain the approval of the Cyprus National Bioethics Committee. Researchers should consult directly with the Cyprus National Bioethics Committee. Contact details and more information on the approval process can be found on http://www.bioethics.gov.cy .

1.2 General Principles

1. The EUC Research Ethics Policy is based on widely accepted principles and practices governing research involving human participants. The key elements are:
   - Minimal risk of harm to participants and researchers;
   - Potential for benefit to the society;
   - Maintenance of the dignity of participants:
   - Minimal risk of harm to the environment;
   - Voluntary informed consent by participants, or special safeguards where this is not possible;
   - Transparency in declaring funding sources;
   - Confidentiality of information supplied by research participants and anonymity of respondents;
   - Acknowledgement of assistance;
   - Appropriate publication and dissemination of research results;
   - Independence and impartiality of researchers.

1.3 The Definition of Human-Related Research

1. All human-related research which includes one or more of the following require ethical assessment and approval at the appropriate level:
   - Direct involvement through physically invasive procedures, such as the taking of blood samples
   - Direct involvement through non-invasive procedures, such as laboratory-based experiments, interviews, questionnaires, surveys, observation
   - Indirect involvement through access to personal information and/or tissue
   - Involvement requiring consent on behalf of others, such as by parents for a child participant

1.4 Vulnerable Participants

1. Some participants may be particularly vulnerable to harm and may require special safeguards for their welfare. In general, it may be inappropriate for undergraduates to undertake research projects involving such participants.
2. Particularly vulnerable participants might be:
   - Infants and children under the age of eighteen

- People with physiological and/or psychological impairments and/or learning difficulties.
- People in poverty
- Relatives of sick, or recently–deceased, people

1.5 The Legal Framework, the Role of Professional Associations and Research Councils

1. All research undertaken under the auspices of EUC must meet statutory requirements. Of particular relevance is the Bioethics Law (N.150 (I)/2001 and 53 (I)/2010), the Data Protection Law (2001), the Patients Protection Law (2005), and all those laws that create the legal framework for the Cyprus National Bioethics Committee.
2. Researchers in particular disciplines should comply with any research ethics guidelines set out by their professional associations.
3. Research Councils, charitable trusts and other research funding bodies in most cases require an undertaking from grant applicants that research proposals involving human participants have been approved by the University Research Ethics Committee or another appropriate body. Some also require audited compliance with their guidelines.

2. Good Research Practices / Code of Ethical Conduct in Research

2.1 Code of ethical conduct in research

Scholarly inquiry and the dissemination of knowledge are central functions of the University. They can be carried out only if faculty and research personnel abide by certain rules of conduct and accept responsibilities stemming from their research. And they can only be carried out if faculty and research personnel are guaranteed certain freedoms. The University expects that faculty and research personnel will be bound by the following research practices:

All faculty and research personnel are free to choose any research matter, to receive support from any legitimate source, and to create, analyse and derive their own findings and conclusions.

Research methods, techniques, and practices should not violate any established professional ethics, or infringe on health, safety, privacy and other personal rights of human beings and/or animals.

The above principles define the university's role with respect to research carried out on its premises. They are set forth to reinforce, and not diminish each faculty and research personnel's personal responsibilities toward their research, and to assure that each faculty and research personnel's source of funding and research applications are consistent with moral and societal conscience.

2.2 Openness in research

The University recognizes and supports the need for faculty and research personnel to protect their own rights, be they academic or intellectual property rights. Even so, the University encourages all faculty and research personnel to be as open as possible when discussing their research with other researchers and the public. This aims at the dissemination of research performed in the University to enhance the international research community's knowledge and understanding.

2.3 Integrity

Faculty and research personnel must be honest about their research and in their review of research coming from other researchers. This applies to all types of research work, including, but not limited to, analysing data, applying for funding, and publishing findings. The contributions of all involved parties should be acknowledged in all published forms of findings.

Faculty and research personnel are liable to the society, their professions, the University, their students and any funding agency that may fund their research. For this reason, faculty and research personnel are expected to understand that any form of plagiarism, deception, fabrication or falsification of research results are regarded as grave disciplinary offences managed by procedures described in detail in Section 2.4.

Any real or potential conflict of interest should be reported by faculty and research personnel to any affected party in a timely manner in all matters concerning research and peer review. According to the United States National Institute of Health "Conflict of interest occurs when individuals involved with the conduct, reporting, oversight, or review of research also have financial or other interests, from which they can benefit, depending on the results of the research." (http://www.nih.gov).

2.4 Misconduct in research

Misconduct in research may involve Fabrication, Falsification, or Plagiarism in proposing, performing, or reviewing research, or in reporting research results. To prove that there has been misconduct in research, the following conditions must be met: The performance of said research has significantly deviated from accepted practices used in the field that the research was performed, and there was intention in the misconduct by the researcher(s).

Any allegations about misconduct in research will be investigated by the University thoroughly, through a special committee formed as described in the University Charter, Annex 11, Article VII.

3. Intellectual Property Policy

3.1 Introduction

The EUC is dedicated to teaching, research, and the extension of knowledge to the public. Faculty, research personnel, and students at the University, hereafter referred to as "University Employees," recognize as two of their major objectives the production of new knowledge and the dissemination of both old and new knowledge. Because of these objectives, the need is created to encourage the production of creative and scholarly works and to develop new and useful materials, devices, processes, and other inventions, some of which may have potential for commercialization.

The University acknowledges the need for an Intellectual Property Rights (IPR) policy, which will promote the University's reputation as socially relevant, leading research and teaching organisation and will directly contribute to the financial position of the EUC if its commercial value is realised.

The policy is based on the principles that will govern the ownership rights emanating from research of and/or materials produced by the EUC's members of staff and students, and to establish objectively fair and equitable criteria for the transfer of knowledge. The EUC thus aims to provide support services to promote the creation of Intellectual Property (IP) whilst seeking to maximise the commercial exploitation of the resulting IPR.

Intellectual Property includes, but is not limited to, patents, registered designs, registered trademarks and applications and the right to apply for any of the foregoing, copyright, design rights, topography rights, database rights, brands, trademarks, utility model rights, rights in the nature of copyright, knowhow, rights in proprietary and confidential information and any other rights in inventions.

The EUC acknowledges that registration and commercial exploitation of Intellectual Property is often a long and costly process that is justified once it is ascertained that there exists a business case for such registration and exploitation. It is known that in practice, only a small number of works can be commercially exploited in a viable manner, depending on the nature and marketability of the work in question.

3.2 Definitions

For the purposes of this Policy:

Creator - "Creator" shall mean, employees of EUC, a student, non-employees contracted to EUC for contracts and services, or a member of a Visiting Teaching Staff involved in the production of Disclosable Work.

Disclosable Work – "Disclosable Work" shall mean such work that is novel, original, and/or important and is likely to bring impact and enhance the Creator's reputation. This work is characterised by the IP rights it generates.

Intellectual Property Policy – “IP Policy” is the name of the policy described here that outlines the regulations of the EUC in regard to disclosure and exploitation of Intellectual Property Rights (IPR).

Organisation – “Organisation” for the purpose of this document is the European University Cyprus (EUC).

Intellectual Property Adjudication Committee – is the name of the committee established to resolve disputes over interpretation or claims arising out of or relating to this policy, or dispute as to ownership rights of Intellectual Property under this policy.

Office of the Vice Rector for Research and External Affairs – is the office within the EUC responsible for the development of and enacting this IP Policy and is the interface between the EUC and the Technology Transfer Facility.

Technology Transfer Facility – “TTF” for the purpose of this policy, is the relevant body responsible for Technology Transfer support in Cyprus.

3.3 Intellectual Property Regulations

3.3.1 Responsibility

1. The IP Policy acknowledges that all members of staff and students have responsibilities with regard to IPR arising from and/or used by them in the course of their teaching/employment.
2. The IP Policy also recognises that all members of staff and students require support and assistance to help them to meet their responsibilities and this will be provided by the Office of the Vice Rector for Research and External Affairs and, subsequently, by the Technology Transfer Facility.

3.3.2 Identification of IP (including duty of confidentiality)

1. It is expected that identification will take place when employees, students, or members of staff are involved in creating and developing IP. Much of the IP which will be created by the EUC’s employees may be anticipated prior to its creation depending on the nature of the project in question and outputs and results that are expected to be generated. Examples of such outputs which are likely to have potential IP rights arising include (but are not limited to):
   - Inventions (whether or not patentable);
   - Methodologies;
   - Software;
   - Databases;
   - Educational/training materials and tools;
   - Modelling tools;
   - Solutions to technical problems; and
   - Design/artistic products.

2. A Summary of the main classes of IPR is listed below:

Patent

A registered patent provides a time-defined (up to 20 years) geographically defined monopoly right to exploit a new commercially valuable invention or process. The basis of the permission to exploit is that the invention's working is disclosed, although patenting is not possible if there has been ANY prior disclosure of the invention. Patents are governed by Cyprus Law or EU Law such as the New Patent Law of Cyprus (Law No. 16(I)/1998).

Copyright

This time-limited right (which varies between 25 and 70 years according to the material) arises automatically on the physical creation (not the idea) of software, original literary, dramatic, artistic or musical work, and in recorded (e.g. film) or published (e.g. layout) derivations. Use of the © mark and owner's name and date is the internationally recognised way of alerting the public to the copyright ownership but the protection (the right to preventing unauthorised copying) exists regardless. Copyright is governed by the Copyright Law, 59/76.

Copyright may be assigned to a third party, but until that point or until a licence is agreed it remains the property of the Creator, unless s/he creates the work 'in the course of his/her employment', in which case it is the property of the employer.

Moral rights

All European countries recognise an author's moral rights. In Cyprus, there are two moral rights: the right of paternity and the right of integrity. These rights relate to the reputation or standing of the creator in the eyes of fellow human beings. To infringe a moral right involves denigrating or harming the author's reputation. The right of integrity means the creator has the right to object to derogatory treatment of his/her work. Basically, this means changing it in a way that affects the nature of the work without permission. Moral rights can be waived (i.e. the author chooses not to exercise the rights) or they can be bequeathed. They cannot be assigned.

Performing rights

Creators of copyright works have the right to protect the physical form in which those works are created – words on the page, pigment on a canvas, or the clay or metal of a sculpture. Performers such as teachers, actors, musicians and dancers also enjoy protection of their performance, especially when recorded on film, video, tape, CD, or in other form.

Performing rights may affect the multimedia elements of online courseware, as well as the Creator's copyright in the material itself.

Database Right

This time-limited (15 years) right arises without registration to protect the compilers of non-original information from losing the benefit of their work through unauthorised copying or re-use.

Industrial Designs

There is automatic time-limited (15 years) protection (the right to prevent unauthorised copying) for unregistered designs, provided authorship can be proved, under the Legal Protection of Industrial Designs and Models Law 4(I)/2002 This design right covers “the appearance of the whole or a part of a product resulting from the features of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation" on condition of novelty of the design.

On registration under Legal Protection of Industrial Designs and Models Law, the designer of the new pattern or shape which has aesthetic appeal (can be 2 or 3 dimensional) acquires a monopoly right of commercialisation for a maximum of 25 years from the filing of the application, divided into 5 periods of 5 years.

An unregistered community design (UCD) gives its owner the right to prevent unauthorised copying of their design throughout the European Union. It is not a monopoly right and lasts for 3 years from the date on which the design was first made available to the public within the Community.

Domain Names

Registering a domain name for Internet use gives a right to use the domain name typically for a period of two years, registered with bodies like ICANN internationally and the University of Cyprus in Cyprus. Owners of trademarks can have established rights to domain names.

Trade Marks

Registering a trade mark under the Cyprus Trade Marks Law, Chapter 268, gives a monopoly right for the use of graphically distinct trading identification signs. Unregistered trade marks have some protection through court actions against "passing off" (piracy), provided that their use has not lapsed for a period of 5 years. Cyprus legislation is fully harmonised with EU Standards applicable in trade mark protection.

3. EUC’s members of staff and students undertake to keep confidential and not disclose any confidential information, data, materials, knowhow, trade secrets or any other IP, to any unauthorised third party and shall also undertake to keep such information secure and strictly confidential both during the course of research activity, be it of an Academic or Collaborative/Contract nature, and also on and following completion thereof.

4. Any breach of this confidentiality and non-disclosure obligation constitutes a serious breach and may lead to disciplinary action and does not prejudice the rights of the EUC to file any action for damages or any other rights available at law.

3.3.3 Coverage of the Regulations

1. Whom does this IP Policy apply to?
   - Employees:
     By persons employed by the EUC in the course of their employment.
   - Students:
     By student members in the course of or incidentally to their studies at EUC.
   - Non-employees contracted to the EUC:
     By persons engaged by EUC under contracts for services during the course of or incidentally to that engagement.
2. Sabbatical, Seconded, Visiting Academics and others:
   By other persons engaged in study or research in the University who, as a condition of their being granted access to the EUC's premises or facilities, have agreed in writing that this Part shall apply to them.
3. Participation of the EUC members of staff/employees and or students in Collaborative and/or Contracted Research.
   The preparation and negotiation of any IP agreements or contracts involving the allocation of rights in and to IP will be undertaken by a competent person authorised for this purpose by the EUC.
   Issues that will be addressed in such agreements include, but will not always be limited to:
   - ownership of Foreground IP;
   - licences to Foreground IP for uses outside the project;
   - ownership of Background IP;
   - licences to use Background IP in the project or activity in question and in relation to the use of the Foreground IP arising from such project or activity;
   - allocation of rights to use or commercialise IP arising from any such project or activity and the sharing of revenues; and
   - publications arising from the relevant project or activity and the rights arising from such projects or activities.

The terms of such agreements may be subject to negotiation.

3.3.4 Exceptions to the Regulations

1. Unless specifically commissioned, typically the EUC will NOT claim ownership of copyright in certain types of Disclosable Work described in this policy as "Creator Copyright Works":
   - artistic works;
   - text and artwork for publication in books;
   - articles written for publication in journals;
   - papers to be presented at conferences;
   - theses and dissertations;
   - oral presentations at conferences;
   - posters for presentation at conferences; and
   - musical scores.

2. Where IP has been generated under the exception clause of this regulation, the EUC may assign the copyright to the Creator.
3. Students – undergraduate and/or postgraduate.

3.3.5 Disclosure of IP

1. All persons bound by these Regulations are required to make reasonably prompt written disclosure to the EUC's Office of the Vice Rector for Research and External Affairs at the outset of the work or as soon as they become aware of it (by completion of the Invention Disclosure Form, the information required for which is provided in Appendix B):
   - any IP of potential commercial value arising from their work;
   - the ownership by a third party of any IP referred to or used for their work;
   - any use to be made of existing EUC IP during their work;
   - any IP which they themselves own which is proposed to be used by the EUC.
2. Creators shall keep all Disclosable Work confidential and avoid disclosing this prematurely and without consent;
3. Only disclose any Disclosable Work and the IP relating to it in accordance with the EUC's policy and instructions;
4. Seek EUC's consent to any publication of information relating to any Disclosable Work;
5. Creators must NOT:
   i. apply for patents or other protection in relation to the Disclosable Work; and
   ii. use any Disclosable Work for their own personal and/or business purposes and/or on their own account.

3.3.6 Ownership of IP

1. Ownership of IP created by an individual who is an employee is generally determined by considering:
   - Who created the IP?
   - Was the IP created in the course of the Creator's employment?
   - Are there any contractual conditions that affect ownership?
2. Assignment of ownership rights

   Generally, the Creator of IP is its legal owner. From the EUC's point of view, the most important exception to this is the general rule that IP is owned by a person's employer where the IP is created as part of, or through the auspices of, the person's employment.
3. The EUC claims ownership of all the Intellectual Property specified in section 2.2, which is devised, made or created by those specified in section 3 and under the exceptions to the regulations in Section 4. It also includes but is not limited to the following:
   i. Any work generated by computer hardware/software owned/operated by the EUC.
   ii. Any work generated that is patentable or non-patentable.
   iii. Any work generated with the aid of the EUC's resources and facilities including but not limited to films, videos, field and laboratory notebooks, multimedia works, photographs, typographic arrangements.
   iv. Any work that is registered and any unregistered designs, plant varieties and topographies.
   v. Any University commissioned work generated. Commissioned work is defined as work which the EUC has specifically employed or requested the person concerned to produce, whether in return of special payment or not and whether solely for the University or as part of a consortium.
   vi. Know-how and information related to the above
   vii. Any work generated as a result of the teaching process including but not limited to teaching materials, methodologies and course outlines.
   viii. Material produced for the purposes of the design, content and delivery of an EUC course or other teaching on behalf of the school, whether used at the school's premises or used in relation to a distance learning and/or e-learning project. This type of material includes slides, examination papers, questions, case studies, and assignments ("course materials").
   ix. Material for projects specifically commissioned by the EUC
   x. All administrative materials and official EUC documents, e.g. software, finance records, administration reports, results and data.

3.3.7 Modus Operandi for Commercial Exploitation of the IPR

1. The EUC is entitled to commercially exploit any result obtained under its aegis (unless this entitlement is relinquished). The Office of the Vice Rector for Research and External Affairs has the responsibility for administration of Disclosures and will work with the TTF of Cyprus, which has responsibility for

commercialisation of Disclosures. As guidance to the commercialisation process, the EUC/TTF will follow a standard process, graphically presented in Appendix A.

2. The Creator/s shall notify the Office of the Vice Rector for Research and External Affairs of all IP which might be commercially exploitable and of any associated materials, including research results, as early as possible in the research project. This notification shall be effected by means of an Invention Disclosure Form (contents as noted in Appendix B). In case of doubt as to whether research is commercially exploitable or otherwise, the Creator/s undertake/s to seek the advice of Cyprus Central TTF.
3. The Office of the Vice Rector for Research and External Affairs shall immediately acknowledge receipt of the Disclosure Form. In consultation with the TTF and the Creator/s, shall decide whether the EUC and the TTF has an interest to protect and exploit the relevant IPR.
4. The TTF shall communicate the decision in writing to the Office of the Vice Rector and the Creator/s by not later than three months from the date of receipt of the Invention Disclosure Form. If the EUC and TTF decide to protect and exploit the IPR, it is understood that:
    - the Creator/s shall collaborate with the EUC and the TTF, to develop an action plan for the protection and commercial exploitation of the IP;
    - the TTF in collaboration with the Creator/s shall ensure that third party rights are not infringed in any way through the process; and
    - the EUC/TTF shall seek to protect the right of the Creator/s to use the said IP for strictly non-commercial purposes.
5. Should the EUC and TTF decide that there is no interest in protecting and exploiting the relevant IPR, or should it fail to inform the Creator/s about its decision within the stipulated time, the EUC may assign all its rights, title and interest in such IP to the Creator/s concerned, whilst the EUC retains the right to use the said IP in whichever manifestation for strictly non-commercial purposes.

6. The Creator/s SHALL NOT enter into any sponsorships or commercial agreements with third parties related to their research at EUC without prior written authorisation by the Office of the Vice Rector for Research and External Affairs. This said, it is understood that consent shall generally be granted to Creator/s for such requests as long as the IPRs of the EUC are safeguarded; otherwise the claims on IPR expected by the third party must be agreed upon explicitly upfront.

3.3.8 IPR protection

1. Some forms of IP require active steps to be taken to obtain protection (e.g.: patents, registered trademarks and registered designs). Other forms of IP rights are protected on creation (e.g. Copyright, EU Database Rights) but still require appropriate management in order to maximise the protection available. Best practices in patent protection require that all materials made publicly available by any employees, members of staff and/or students should include a copyright notice.

2. Any decisions relating to the registration of any IP rights such as making an application for a patent or a registered trade mark or a registered design (including any decisions to continue or discontinue any such application) should be made in consultation with the Office of the Vice Rector for Research and External Affairs and the TTF. The IP registration process can be very expensive and IP protection costs should not be incurred without appropriate consideration of how such costs will be recovered.

3.3.9 Revenue Sharing Mechanism

The EUC's employees and students can benefit from the Revenue Sharing Scheme if their work generates income for the EUC. The scheme is presented in Appendix C. Note that such revenue to be shared is typically calculated after deduction of all costs incurred by the EUC and TTF in developing, protecting, exploiting, and marketing the Disclosable Work and the Intellectual Property it contains.

3.3.10 Leaving the EUC

Cessation of employment, under normal circumstances, will not affect an individual's right to receive a share of revenue. Exceptions to this rule include: cessation of employment due to disciplinary actions.

3.3.11 Applications to use the EUC's IP

1. The EUC may be willing to consider requests from its staff and/or students for a licence to use specific IP, owned by EUC for their use although the terms and decision to grant any such licences is a decision wholly made by the EUC.
2. Applications for such licence should be made in writing to the Office of the Vice Rector for Research and External Affairs.

3.3.12 Breach of the Regulations

1. Breach of the regulations listed in this Policy may be a disciplinary matter for the EUC's staff and students under the normal procedures.
2. The EUC shall consider all avenues available to it, including legal action if necessary, in respect to persons bound by these regulations who acted in breach of them.

3.3.13 Discretion to assign/licence back

1. If the EUC does not wish to pursue the commercialisation of any Intellectual Property or does not wish to maintain an interest in the IPR, it has the right to assign such IPR rights to the Creator/s of the IPR by entering into an agreement to enable the IP to be used by the Creators. This will generally only be granted where there is clear evidence that the IP provides no other benefit to the EUC and is not related to other IP, which the EUC has an interest in.
   However, the EUC shall not assign its IP if they consider that the commercialisation of the IP could potentially bring harm to the name of the EUC. Decisions regarding potential harm will be taken by the Research Ethics Committee of EUC.

2. Requests for any transfer of rights from the EUC to another party with rights should be made in the first instance to the Vice Rector for Research and External Affairs.

3.3.14 Amendments to the Regulations

These Regulations may be amended by the Senate of the EUC on the recommendation of the Vice Rector for Research and External Affairs.

3.3.15 Death

In the event of a researcher's death, the entitlement shall continue for the benefit of his or her estate.

3.3.16 Disputes

1. Any question of interpretation or claim arising out of or relating to this policy, or dispute as to ownership rights of intellectual property under this policy, will be settled by submitting to the EUC's Intellectual Property Adjudication Committee a letter setting forth the grievance or issue to be resolved. The committee will review the matter and then advise the parties of its decision within 60 days of submission of the letter.
2. The Intellectual Property Adjudication Committee will consist of a chair who is a member of the tenured faculty, at the rank of either a Professor or an Associate Professor, one member of the faculty from each School, at the rank of either Assistant Professor or Associate Professor or Professor, an individual from the EUC with knowledge of Intellectual Property and experience in commercialisation of Intellectual Property, and two other members representing, respectively, the EUC administration, and the student body. The chair will be appointed by the Vice Rector for Research and External Affairs, with the advice and consent of the Senate Research Committee, and the remaining members of the committee will be appointed: the faculty members, each by their School's Council, the administration representative by the University Council or its designee, and the student representative by the Student Union.
   The committee will use the guidelines set forth in this policy to decide upon a fair resolution of any dispute.
3. Any disputes regarding the revenue distribution from the exploitation of Disclosable Works will be dealt with in accordance with the EUC's normal member of staff or student dispute procedures as outlined in the contractual terms of conditions.
4. The Parties shall attempt to settle any claim, dispute or controversy arising in connection with this Policy, including without limitation any controversy regarding the interpretation of this Policy, through consultation and negotiation in good faith and spirit of mutual cooperation. Where such claims or disputes cannot be settled amicably, they may be taken to court.
5. This Agreement shall be governed by, and construed in accordance with the laws of Cyprus.

4. Offices, Committees and Centres for Research

4.1 Vice Rector for Research and External Affairs

The Vice Rector for Research and External Affairs (from now on referred to as the Vice Rector) is the person responsible for representing the University on research matters and enhancing activities related to research within the University. Moreover the Vice Rector facilitates and supports, when asked by faculty or research members, all research activities, including the implementation of research projects, the organization of scientific conferences and the establishment of research units/labs. In addition, the Vice Rector is responsible for the smooth implementation of the University's Research Policy.

4.2 Senate Research Committee

The administration of the research activity is facilitated by the Senate Research Committee of the University. The Committee composition is prescribed in the University Charter and the Committee is accountable to the Senate of the University.

4.3 Research Foundations and Centres

Research is carried out in university departments, research foundations, and centres. The Senate suggests to the University Council the formation of new foundations and research centres or the discontinuation of existing ones, if necessary.

The University Council approves the establishment of these foundations and research centres. Separate regulations are issued for the establishment of University research centres. Detailed description of the mission, area of specialization, and operation of each foundation or research centre is given in a separate document.

4.4 Research Office

Detailed description of the mission, area of specialization, and operation of the Research Office is given in a separate document.

5. Rules Governing External Research Programmes

5.1 Suggested procedure for submitting and implementing a funded research project

The following rules apply for externally funded research projects:

5.1.1 Submission of research proposals:

Faculty and research personnel that are interested in submitting a proposal or participate in a proposal for ANY kind of externally funded research project

(commercial, consultancy, RPF, European etc) should consult and get the approval of the EUC Research Office. The formal procedures developed by the Research Office pertaining to the development of a research proposal and to participation in a research project should be followed in all cases. Given that in all research and consulting application forms a budget also needs to be prepared, the budget will be developed in collaboration with the EUC Research Office, sharing their expertise with the faculty and research personnel and advising them accordingly about the cost models and cost categories used in each case. This procedure should make sure that the proposal satisfies all the necessary criteria of the particular research call.

The final approval for financial and administrative issues of proposals or projects will be signed by the legal representative of EUC.

5.1.2 Project implementation

The formal procedures developed by the Research Office pertaining to the administration of a research project should be followed in all cases.

In the case where a project is awarded, a copy of the contract and all the original receipts, invoices, contracts and other accounting documents regarding expenses of the project will be maintained by the EUC Research Office without any additional remuneration or personnel costs added to the budget of a project. The researcher/s involved in an externally funded project are responsible for submitting all receipts, invoices, contracts and other accounting documents relevant to their project to this department. No payment will be processed before the submission of the aforementioned documents to the Research Office.

Timesheets should be kept for all projects. These will be used as the basis for calculating the money to be paid to researchers for all types of projects. The EUC Research Office will assist researchers to calculate the hourly and daily rate for each staff member.

The researcher must also inform the Chief Financial Officer of the University, through the EUC Research Office, in order to create a separate ledger (account) in the University's Accounts Department. After completion of the project, the Accounts Department will keep the file on record for 5 years or more if needed by the contractual agreement.

The EUC Research Office should keep a file with all the details concerning the project. The file must be made available to the Senate Research Committee upon request.

5.1.3 Financial issues concerning externally funded research projects

All incoming funds for the execution of a project are deposited in a separate account (ledger) of the University and all necessary expenses with their receipts relating to the project are paid/signed by the Vice Rector for Research and External Affairs, the CFO and the CEO of the University.

The time spent by faculty and research personnel on national, European or international research projects is, with rare exceptions, an eligible cost for inclusion in a project budget at a level which reflects the time to be spent by faculty and research personnel on the project and the employer's cost. These are real project costs and their inclusion in project budgets is strongly required.

Salary payments to faculty and research personnel will be paid out regularly by the Accounts department upon the project coordinator's request to the Research Office and provided that the allocated amount for the previous period has been received from the funding agency and all reporting requirements for the previous period to the funding agency have been met.

In cases of delay in receiving the predetermined instalment, the University will grant to the researcher the required funds (not his/her compensation/remuneration but costs such as equipment, consumables, traveling) to initiate the research, provided that a copy of the contract and all necessary documentation had been submitted to the Research Office.

Employment of additional temporary staff, budgeted for completion of the research project, will be the responsibility of the project coordinator. The remuneration for temporary staff will depend on the corresponding budget of the project and the possible allocation of funds for this purpose.

Subcontracting activities within the framework of a research project will be the responsibility of the project coordinator. These activities should be in alignment with the corresponding budget of the project, the grant rules, and the EUC subcontracting policy.

In the case where a faculty or research personnel fails to complete a research project due to failure to meet his/her contractual obligations, or if it is clear that there was an intention of misconduct and there are financial damages laid upon the University relating to this event, the faculty or research personnel is liable to pay these damages. This will not be applied in cases such as health problem, etc, where there is clearly not an intention of misconduct.

5.1.4 University research fund

All funds allocated for research from externally-funded research projects, the University as well as funds offered for research purposes from third parties will be deposited in the University Research Fund. Recommendations for the allocation of funds are made by the Senate Research Committee and are subject

to the final approval of the Management of the University. These funds can be used to finance such activities as:

(a) Participation of academic researchers in conferences, seminars, and meetings to co-ordinate activities, which are needed for submission of external programmes.
(b) The administration costs associated with providing support services to academic researchers.
(c) Organisation of training seminars for the faculty and research personnel of the University; these seminars shall be organized if and only will help/assist and/or facilitate researchers to enhance and further develop their knowledge in subjects related to their research fields and help them design and implement research projects.
(d) Purchase of software, hardware and equipment that are needed by faculty and research personnel for research projects.
(e) The funding for the University's Internal Research Awards such as PhD scholarships
(f) Development of Infrastructure related to the research activity of the University.
(g) Funding of the activities of the Research Office of the University.

6. Rules Governing Internal Research Awards

The University's "Internal Research Awards" (IRA) are launched on an annual basis by the Senate Research Committee, are announced by the Vice Rector for Research & External Affairs and financed by the University Research Fund and external sponsors as described in Section 5.1.4 above.

6.1 Purpose

IRAs are awarded to EUC faculty in order to pursue research and other creative work. IRAs provide support for exploratory research projects which might result in proposals submitted for external funding or in creative work that is likely to enhance the recognition of the faculty and research personnel and the University at large. IRAs may be used for funding travel, equipment, supplies, PhD student assistants' scholarships, student assistants, research assistants and other expenses. Funding for this programme comes from the University Research Fund.

6.2 Eligibility for the awards

All full-time faculty members of the University who have the rank of Assistant Professor or higher are eligible to apply for the awards. Specific eligibility criteria may apply for each type of award.

6.3 Application Procedure

The Vice Rector for Research and External Affairs initiates the selection process by issuing a call for proposals. The deadline for the submission of proposals will be announced. Application materials will be available from the office of the Vice Rector for Research and External Affairs and the proposals will be submitted electronically to the office of the Vice Rector.

7. Teaching Hours Reduction for Research Purposes

The University rewards members of staff who excel in research by awarding them Teaching Hours Reduction (THR). A THR may be awarded if the member of staff fulfils the conditions in one or more of the three schemes outlined below.

A member of staff may be awarded a THR under more than one of the schemes described below if he/she is eligible. The minimum teaching per semester can be reduced down to 6 hours per week based on the accumulated research load reduction hours. An exemption may be considered for Deans and Chairs.

All allocations of THR under the three schemes outlined below will be made after a recommendation of an ad-hoc committee chaired by the Vice Rector for Research and External Affairs. The committee will take into account scheduling constraints and other considerations for the sustainable development of research activity at the university. The committee will meet at an appropriate time in each semester in order to make the THR allocations in time for the preparation of the schedule of classes for the next semester.

7.1 Award of a THR for participation in research projects

Members of staff are eligible to apply for a Teaching Hours Reduction (THR) when conducting funded research for the full duration and until the completion of relevant funded projects. Should their application meets with success, funded project coordinators are entitled to a three-hour teaching reduction per semester for the whole duration of the project, whereas research partners are eligible for a THR equivalent to at least one third of the duration of the project.

Based on the policy of the University with regard to THR requests, Faculty, research and Other Teaching Personnel (OTP) members are expected to submit a written request to the Chairperson of his/her Department before the beginning of the academic year/semester. The Chairperson will process the THR request by way of making a relevant recommendation to the Dean of School. The Dean will then forward his/her recommendation to the Vice Rector for final approval. After the deadline expires, applications for teaching hours reduction will not be accepted.

The deadlines for submitting a request for teaching load reduction per semester are the following:

For the Fall Semester: 1st of May
For the Spring Semester: 31st of October

If a research proposal was awarded a grant after the special case of approval of a research/grant proposal (i.e. RPF, EU etc) while an academic year is in progress, a THR request should be submitted and be approved prior to the beginning of the next semester, during which the teaching load reduction will be applied. The research project should commence at least one month before the beginning of the next semester for the THR to be awarded.

7.2 Award of a THR for writing a book

A three-hour teaching reduction per semester will be awarded for the purpose of writing a book upon submission of a publishing contract by a reputable publisher. A total of two THR allocations (maximum 6 credits) will be made under the scheme for each book contract. The same deadlines and application procedure apply as in the scheme described in section 7.1.

7.3 Award of a THR by accumulation of points

A third scheme for the award of a THR takes into account the research activity of members of staff and the points they have accumulated according to the tables given in Appendix D. A THR of 3 hours per week is awarded to faculty members once they accumulate 100 (one hundred) points and the same number of points are automatically deducted from his/her accumulated total. Points accumulated over time but not utilized by a member of staff will simply remain at his/her disposal.

Note that members of staff may consider the year 2016 as the starting point for calculating points accumulated through research. The calculation of points will be valid after it has been approved by the Dean of the School and the Vice Rector for Research and External Affairs.

New faculty members can also get THRs under this scheme from the first semester of their employment. The points accumulated from their publications in the five (5) years prior to their appointment will be taken into account.

8. Equipment Acquired through Internal and External Funding

8.1 Equipment acquired through University funds

All equipment that has been acquired through funds that come directly through the university's funds (internal research grants, university research funds) will belong solely to the University and will be used by the faculty and research personnel's affiliated department or lab, according to the affiliation used by said faculty and research personnel in the funded research proposal and/or project. The faculty and research member is entitled to use the equipment throughout the duration of the funded project and this remains within the research unit/laboratory once the project

is completed, or within the faculty member's department, under his/her direct supervision if s/he does not belong to a unit / lab. Any required maintenance of the equipment should be undertaken by the University.

8.2 Equipment purchased through external funding

Equipment (software and hardware) is often provided in full or partly in the budget of proposals for external funding to enable the faculty and research member to carry out research effectively. This kind of equipment (computers, projectors, software programmes, fax and printing machines, etc.) is the property of the University but remains in the faculty or research personnel's research unit/laboratory or when this is not applicable in his/her department, under his/her supervision. The faculty member is entitled to use the equipment throughout the duration of the externally funded project. When faculty or research personnel who have had externally funded research projects leave the University, the status of any equipment purchased remains a property of the unit/lab or department that the faculty or research personnel belonged.

Any required maintenance of the equipment should again be undertaken by the University.

In the unlikely event that a faculty or research personnel obtains equipment via external funding that is not processed through the University's budget, the status of the equipment should be negotiated with the Vice Rector to determine ownership and responsibility for repair and replacement. Faculty or research personnel are encouraged to seek outside funding to upgrade, or replace their research equipment.

The Research Office is committed to working with faculty or research personnel to develop proposals for research and teaching equipment. Equipment grants usually require an institutional match, and faculty or research members are advised to consult with the Research Office and the Director of MIS early in the process about this matter. The MIS should be able to help faculty or research personnel to identify the best hardware and software products and estimate costs for proposal budgets.

8.3 Provision of computing equipment by MIS

The MIS department supplies desktop office computers, computer teaching labs, copy and printing machines and other types of equipment needed for research (software and hardware). The Director of the MIS department is responsible for keeping the University's inventory records and adjust these in the case of equipment purchases or wearing out of equipment (being fully depreciated).

9. Policy on Research Staff

9.1 Introduction

Academic Research Staff are EUC contract employees hired to work on EUC research activities as defined below. As EUC employees, Academic Research Staff are subject to all policies and procedures related to EUC employment, and receive all benefits implied by the employment law.

9.2 Definitions of Roles

The following positions for research staff are being described in the following sections:

- Research Associate
- Research Fellow
- Senior Research Fellow
- Honorary Research Staff

9.2.1 Job Description for the Position of Research Associate

9.2.1.1 Overall Role

For researchers who are educated to first degree level (and Master's degree) and who possess sufficient breadth or depth of knowledge in the discipline of research methods and techniques to work within their own area. Role holders who gain their doctorate during the course of employment will normally be recommended for promotion to Research Fellow, if this is appropriate for the duties and responsibilities of the post.

As a team member of the Research Laboratory/Programme the Research Associate will contribute quality research outputs and conceptual support to projects. With the guidance of the supervisor/programme leader, and within the bounds of the Research Laboratory/Programme mandate, the Research Associate will:

9.2.1.2 Key Responsibilities

• Conceptualize and conduct short-term experiments and research activities in support of broadbased/longitudinal research projects, ensuring consistency with established methodological approaches and models, adherence to project timelines, and completeness of documentation;
• Conduct studies of related literature and research to support the design and implementation of projects and development of reports, ensuring conceptual relevance, comprehensiveness, and currency of information;

• Write and publish articles in peer-reviewed journals that highlight findings from research and experimental activities ensuring consistency with the highest standards of academic publication and showcasing the Centre's/Programme's scientific leadership;
• Communicate to Programme/Project team developments/progress and results of research activities ensuring that relevant information and issues in the implementation of projects/experiments are captured in as comprehensive and timely manner as possible;
• Develop collaborative links with core scientific personnel in related programme areas to gain exposure to, and build knowledge on experimental/research activities and approaches, in order to subsequently improve conceptual development and implementation of existing programmes;
• Utilize appropriate and current techniques/protocols in experimental laboratory management to ensure integrity and security of experimental process, comprehensive documentation, and replicability of experimental procedures;
• Design and organize databases along project frameworks and experimental research design that support overall research management, including the monitoring and evaluation of project inputs, actions, and outcomes, as well as the subsequent integration of these databases to other databanks;
• Identify areas of improvement within the research structure using integrated management approaches in pursuit of capacity building/strengthening and the preservation of scientific rigor in research studies.
• To contribute to the design of a range of experiments/fieldwork/research methodologies in relation to the specific project that they are working on
• To set up and run experiments/fieldwork in consultation with the Principal Investigator, ensuring that the experiments/fieldwork are appropriately supervised and supported. To record, analyse and write up the results of these experiments/fieldwork.
• To prepare and present findings of research activity to colleagues for review purposes.
• To contribute to the drafting and submitting of papers to appropriate peer reviewed journals.
• To prepare progress reports on research for funding bodies when required.
• To contribute to the preparation and drafting of research bids and proposals.
• To contribute to the overall activities of the research team and department as required.
• To analyse and interpret the results of their own research

9.2.1.3 Skills and Qualifications

Education: Level Bachelor and/or Master's in the Programme Area
Experience and Skills:
Basic research skills and knowledge of research techniques
Ability to analyse and write up data
Ability to present and communicate research results effectively to a range of audiences

9.2.1.4 EUC Pertaining Benefits

Researchers will have access to facilities which are necessary and appropriate for the performance of their duties.
- Desk, Telephone line and PC
- MS Office, SPSS, Email and Printing Rights
- Business Cards with the University Emblem and the Research Laboratory they belong to
- Full access to the library

All researchers must receive the same forms of employment documentation as other academic-related staff of the University:
- a formal contract signed by the relevant appointing authority;
- written confirmation of any changes in the terms of employment;
- job description or the generic description of the role and, where appropriate, a list of expected research goals;
- further to the completion of the contract, researchers are responsible for returning in good condition all the equipment as well as business cards that have been provided to them.

9.2.2 Job Description for the Position of Research Fellow

9.2.2.1 Overall Role

A Research Fellow is a researcher with some research experience and who has typically been awarded a doctoral degree. A Research Fellow will often have supervisory responsibilities for more junior researchers and will often lead a team of researchers to achieve a research project's aims. They will initiate, develop, design and be responsible for the delivery of a programme of high quality research and may have full authority over several phases of project work.

9.2.2.2 Key Responsibilities

• Design, Conceptualize and conduct short-term experiments and research activities in support of broadbased/longitudinal research projects, ensuring consistency with established methodological approaches and models, adherence to project timelines, and completeness of documentation;
• Supervise and Conduct studies of related literature and research to support the design and implementation of projects and development of reports, ensuring conceptual relevance, comprehensiveness, and currency of information;
• Write and publish articles in peer-reviewed journals that highlight findings from research and experimental activities ensuring consistency with the highest standards of academic publication and showcasing the Centre's/Programme's scientific leadership;
• Take the lead within the team and communicate to Programme/Project team developments/progress and results of research activities ensuring that relevant

information and issues in the implementation of projects/experiments are captured in as comprehensive and timely manner as possible;
• Develop collaborative links with core scientific personnel in related programme areas to gain exposure to, and build knowledge on experimental/research activities and approaches, in order to subsequently improve conceptual development and implementation of existing programmes;
• Utilize appropriate and current techniques/protocols in experimental laboratory management to ensure integrity and security of experimental process, comprehensive documentation, and replicability of experimental procedures;
• Design and organize databases along project frameworks and experimental research design that support overall research management, including the monitoring and evaluation of project inputs, actions, and outcomes, as well as the subsequent integration of these databases to other databanks;
• Identify areas of improvement within the research structure using integrated management approaches in pursuit of capacity building/strengthening and the preservation of scientific rigor in research studies.
• Develop research objectives, projects and proposals.
• Conduct individual or collaborative research projects.
• Identify sources of funding and contribute to the process of securing funds.

• Act as principal investigator on research projects.
• Manage and lead a team of researchers to achieve the aims of a research project.
• Oversee and appropriately supervise and support the research activities (experiments, fieldwork etc.) of a research programme/project.
• Ensure that research results are recorded, analysed and written up in a timely fashion.
• Manage research grants in accordance with EUC Financial Regulations and the conditions of the funding body (e.g. EU, RPF etc.)
• Prepare and present findings of research activity to colleagues for review purposes.
• Submit papers to relevant peer reviewed journals and attend and present findings at relevant conferences.
• Prepare progress reports on research for funding bodies when required
• Participate in and develop external networks, for example to identify sources of funding or to build relationships for future research activities

9.2.2.3 Skills and Qualifications

Education: Level PhD in the Programme Area
Experience: at least 1-3 years relevant experience.
The candidate must possess sufficient specialist knowledge in the specific discipline to develop research programmes and methodologies*.*

9.2.2.4 EUC Pertaining Benefits

Researchers will have access to facilities which are necessary and appropriate for the performance of their duties.

- Desk, Telephone line and PC
- MS Office, SPSS, Email and Printing Rights
- Business Cards with the University Emblem and the Research Laboratory they belong to
- Full access to the library

All researchers must receive the same forms of employment documentation as other academic-related staff of the University:

• a formal contract signed by the relevant appointing authority;
• written confirmation of any changes in the terms of employment;
• job description or the generic description of the role and, where appropriate, a list of expected research goals;
• further to the completion of the contract, researchers are responsible for returning in good condition all the equipment as well as business cards that have been provided to them

9.2.3 Job Description for the Position of Senior Research Fellow

9.2.3.1 Overall Role

A Senior Research Fellow is an experienced researcher holding a leadership role in a research group/centre/institute. Post-holders are expected to undertake the role of Principal Investigator on major research projects, exhibit a strong reputation for independent research, and provide academic leadership. They are also expected to support the management activity of the relevant School/Research Centre, and contribute to the delivery of the School's/ Centre's/Laboratory's research strategy.

9.2.3.2 Key Responsibilities

- Supervise postgraduate research students
- Contribute to the development of research strategies for the relevant School/Centre/Laboratory.
- Define research objectives and questions
- Develop proposals for research projects which will make a significant impact by leading to an increase in knowledge and understanding
- Actively seek research funding and secure it as far as it is reasonably possible
- Generate new research approaches
- Review and synthesise the outcomes of research studies
- Interpret findings obtained from research projects and develop new insights
- Contribute generally to the development of thought and practice in the field
- Provide academic leadership to those working within research areas - for example, by co-ordinating the work of others to ensure that research projects are delivered effectively and to time
- Contribute to the development of teams and individuals through the appraisal system and providing advice on personal development

- Act as line manager (e.g. of research teams)
- Act as a personal mentor to peers and colleagues
- Provide advice on issues such as ensuring the appropriate balance of research projects, appointment of researchers and other performance related issues
- Identify opportunities for strategic development of new projects or other areas of research activity and contribute to the development of such ideas

9.2.3.3 Skills and Qualifications

Education: Level PhD in the Programme Area
Experience: at least 7-10 years relevant experience. Significant post-qualification research experience with a track record of high-quality publications.
Experience of successful supervision of students
Experience in a leadership role in a Research Group/Centre or Laboratory

9.2.3.4 EUC Pertaining Benefits

Researchers will have access to facilities which are necessary and appropriate for the performance of their duties.
- Desk, Telephone line and PC
- MS Office, SPSS, Email and Printing Rights
- Business Cards with the University Emblem and the Research Laboratory they belong to
- Full access to the library

All researchers must receive the same forms of employment documentation as other academic-related staff of the University:
• a formal contract signed by the relevant appointing authority;
• written confirmation of any changes in the terms of employment;
• job description or the generic description of the role and, where appropriate, a list of expected research goals;
• further to the completion of the contract, researchers are responsible for returning in good condition all the equipment as well as business cards that have been provided to them

9.3 Procedures for Appointment

9.3.1 Selection and Search Procedures

As a general rule, an appointment to the Academic Research Staff requires a search for a suitable candidate. Searches are initiated with a written vacancy announcement, such as in relevant professional journals or other publications.

The text for the announcement should be sent to the Office of the Vice Rector of Research and External Affairs and the Office of the Director of Human Resources, clearly describing the terms of employment, length of employment, identity and duration of funding sources contributing to his or her salary and line manager (the person the

researcher will be reporting to). The text should be advertised for a reasonable amount of time. A copy of a current CV, a cover letter and at least one recommendation should be sought for. A short list of the potential candidates will be created based on merit and the top part of the list will be called for a structured interview with the line manager. At the end of the procedure, the line manager will report back to the Office of the Vice Rector of Research and External Affairs and the Office of the Director of Human Resources, the name(s) of the proposed Researcher.

9.3.2 Criteria for the Appointment to Rank of Research Associate

Minimum qualifications as described in Section 9.2.1.

9.3.3 Criteria and Procedures for the Promotion to the Rank of Research Fellow

A Research Associate may, during the course of his/her appointment obtain, his/her PhD. In such cases, the employee (provided that he/she fulfills the work experience as described in Section 9.2.2) is promoted to the rank of Research Fellow. If the funding source that sponsors the program the researcher is assigned to accounts for a pay rise this is immediately applied.

9.4 Honorary Research Staff

The work of Research Centers is enhanced by the involvement and collaboration in the Research Centers' activities of personnel who are not employees of the University. To recognise the association, EUC may confer an honorary title to such individuals during the period of their association. An honorary title may not be conferred on an employee of EUC.

The title to be conferred will depend on the level of distinction and qualification of the candidate. Applications should come from the Dean of the School with:

- a copy of the person's CV
- a citation that should include:
    - a description of contributions to teaching
    - research being undertaken with academic staff as evidenced by joint publications/research projects and research grants or contracts being held jointly or a significant involvement in industry/academic joint activities within the College
    - rationale for offering the association
    - the start date and end date of the association

Honorary titles are intended to recognise ongoing attachments and are awarded for a fixed term, normally up to three years in the first instance. No monetary honorarium is associated with the offer.

The honorary research titles that can be awarded are:

9.4.1 Honorary Principal Research Fellow

Will have made an outstanding contribution to teaching and research

9.4.2 Honorary Senior Research Fellow

Extensive research experience required, the quality of which is determined by refereed publications, invitations to speak at conferences, hold an established national reputation and a known or developing international reputation. Have the ability to attract significant external research funding. Will usually lead a team of other research staff, possibly drawn from several disciplines

9.4.3 Honorary Research Fellow

Proven ability of high quality research, evidenced by authorship of a range of publications. Capable of attracting external research funding. May be required to undertake project management and/or supervise teams and other research staff; expected to provide expert advice and guidance to others

9.4.4 Honorary Research Associate

Required to produce independent original research and to take initiatives in planning of research.

9.5 Intellectual Property Rights

All IP generated throughout the employment of an Academic Research Staff Member belongs to EUC. In such cases that the Researcher is employed in a project that assigns explicit IP rights (e.g. an EU funded project) then the rules as set out by the funding agency are followed.

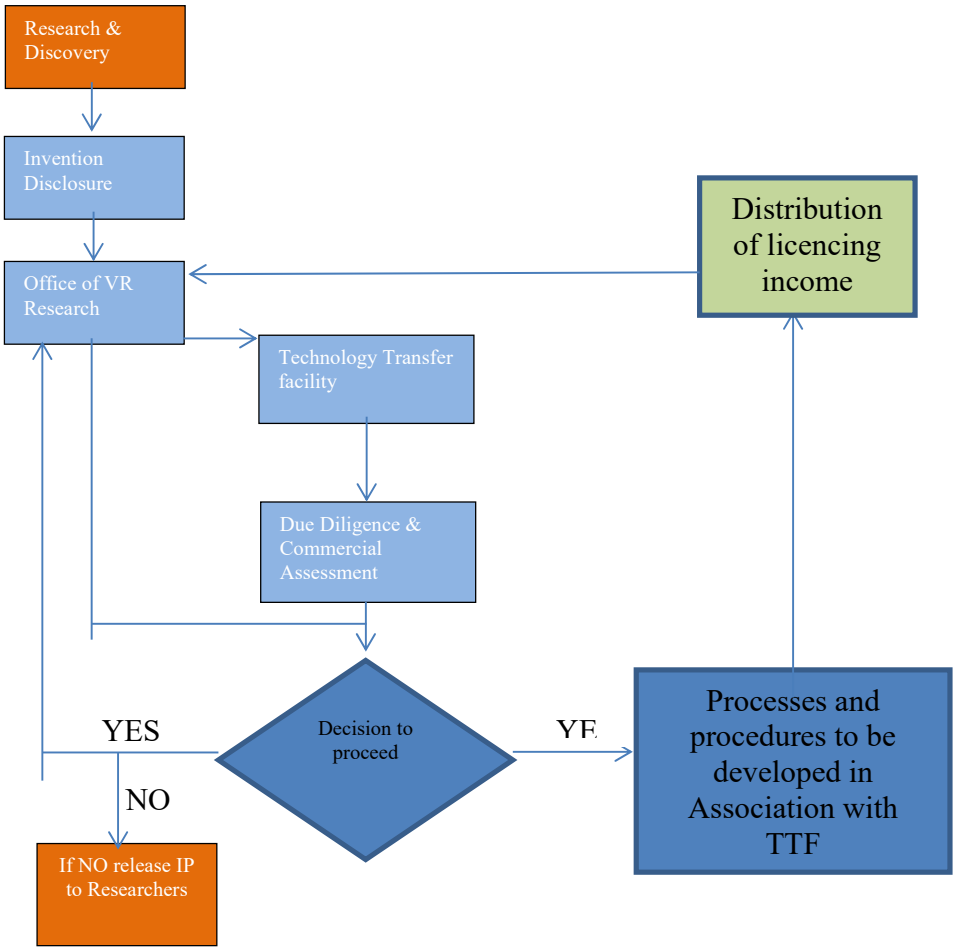
Honorary Research Staff may be required to assign the rights to any IP they create in the course of their academic activities to EUC. EUC may have obligations to organisations which are funding the research (e.g. an EU funded project) in question which it will not be able to honour without such an assignment of rights being in place. Associates are treated as if they were EUC Employees for the purposes of revenue sharing.

9.6 Involvement of Research Staff

Wherever possible, Academic Research staff should be encouraged to take part in university decision making processes, for example by inclusion in relevant departmental committees. Where appropriate, researchers should be included at University level, for example as representatives in working groups and staff consultation exercises.

Appendix A:

A Technology Transfer Process Map – to be completed when the TTF has been established.



Appendix B:

Invention Disclosure Guidelines

Invention Disclosure Form - Example

An Invention Disclosure Form (IDF) is designed to determine the basic facts relating to an invention, design, or copyright material. It is a way of capturing an invention and establishing who the inventors are, what the invention is, who is funding it, what the anticipated product/ market is and initiate Intellectual Property (IP) due diligence. Information on the following aspects of an invention should be included in an Invention Disclosure Form.

1. Descriptive Title of the Invention.
2. Who was involved? Please specify for each individual who contributed, invented or authored (if software):
    a. Their names and if any are foreign nationals;
    b. Who their employer is; are any contracts or arrangements in place?
    c. What they contributed to the development of the technology (e.g. came up with the original idea; designed experiments; carried out experimental work; wrote code)
3. Detail of your invention:
    a. What do you think your invention is?
    b. What will your invention be used for?
    c. What are the advantages of your invention and how does it improve on the present situation?
    d. What is new about your invention?
    e. How and why does it work? What is the science behind the invention
    f. Are there any other uses of the invention?
4. Interest from external organisations and their details.
5. Information on published literature (including patents) relevant to your invention?
6. When and where the invention was first conceived?
7. What are your future plans for developing the technology?
8. Who have you told about the invention, when and where?
9. When did you first describe the invention in writing or electronically?
10. Publications, abstracts, conferences to date.
11. Publication and conference plans.
12. Funding information (comprehensive), e.g including third party support, Material Sales or Transfers, patient consents.

    For inventions that include software, please provide the following additional information.

13. Application name and version number.

14. For source code developed by the researchers identified in question 2 above, include: source files used, programming languages, development tools, copyright protection in source code.
15. For new versions, include: source files changed, added or removed since the previous version, documentation required for others to use, if the source files have been distributed outside the university, and in what form, and are the source files available as a web-download – inc. URL and terms under which the download is available.
16. For other source files or libraries that are required to build the software application (external software), list the following: all external software required to use the application; who owns that software, how was the software obtained, licence terms or FOSS – name of the licence.

Appendix C:

Suggested Revenue Sharing Scheme

The EUC will share royalty income with employees and/or students involved in producing Disclosable Work whose exploitation generates revenue for the EUC. Payments are made at the Organisation's sole discretion, but the EUC will normally share royalty income in accordance with the table below. This may be either as a lump sum or as royalty income over a period of time.

Table C1

Net Revenue	Allocated to the Creator/s	Allocated to the EUC Central Budget	Allocated to the Creator'/s School of Study or Department Budget	Allocated to Support the TTF
100%	50%	20%	20%	10%

Appendix D

D1. Points accumulation from Research

Table D1 details the evaluation categories which will be used for the calculation of research points allocated to EUC researchers. The table has been constructed taking into account the following:

1. The points awarded are based on the evaluation of research accomplishments, not on the estimation / calculation of hours spent during the implementation of a research activity.
2. A research accomplishment is any research-related activity which strengthens the research portfolio and enhances the research esteem of a researcher in particular, and the EUC in general
3. It is apparent that specific research accomplishments cannot be evaluated in a similar manner across the range of research disciplines. Therefore, the following table is implicitly "averaging" the weight of these accomplishments, so that the scheme can be operational and fair.
4. The term "national", when used in association with a conference, refers to one which is local in nature (i.e. only researchers from Cypriot Universities and other Cypriot research establishments participated in it).
5. The term "international", when used in association with a conference, refers to one which is international in nature (i.e. researchers from Universities and other research establishments from at least two countries participated in it).
6. The term "national", when used in association with a publication refers to one published by a Cypriot university or other Cypriot academic publishing house.
7. The term "international", when used in association with a publication refers to one published by an international university or other international academic publishing house.

Where a publication of any type (conference, journal, book chapter, monograph, textbook, book, or other) concerns two or more authors, the following points' calculation rules will apply: For cases up to (and including) two (2) authors, full points are awarded to the author in consideration. For each additional co-author (three (3) authors or more), a deduction of 2 points will be implemented on the full points' allocation for the category considered. The minimum points that an author will be awarded cannot be smaller than 50% of the full points' allocation for the category considered.

Table D1

Points	Conferences	Journals	Books	Research Projects	Other*
5	1. Presentation of poster / article in national conference (refereed) 2. Presentation as invited keynote speaker (refereed national conference)			1. Unsuccessful submission of funded research proposal in national / international organization (research partner)	Member of scientific / conference organizing committee (national / international)
10	1. Presentation of refereed poster / article in international conference (refereed) 2. Presentation as invited keynote speaker (refereed international conference) 3. Editor of national conference proceedings (refereed)	1. Publication of refereed journal article (journal not in ISI / Scopus / ACM / IEEE/etc.) 2. Editor of refereed journal special issue (journal not in ISI / Scopus / ACM / IEEE/etc.)	Publication of refereed book chapter (national)	1. Unsuccessful submission of funded research proposal in national organisation (project coordinator)	General Chair or Program Chair of refereed national conference
15	1. Editor of international conference proceedings (refereed)		Publication of refereed book chapter (international)	1. Unsuccessful submission of funded research proposal in international organization (project coordinator)	General Chair or Program Chair of refereed international conference

Table D1 (continues)

Points	Conferences	Journals	Book Chapters / Editors	Research Projects	Other*
20		1. Editor of refereed journal special issue (journal in ISI / Scopus / ACM / IEEE/etc.)	Editor of refereed book / book series		
25		1. Publication of refereed journal article (journal in ISI / Scopus / ACM / IEEE/etc.)			

* For these categories only 50% of the points will be accumulated

D2. Points accumulation from Research / Department of Arts

Due to the nature of the research conducted in the Department of Arts, Table D2 has been produced to address the research output of the Department. For all other research outputs such as journal papers, conferences, books, etc. the European University Cyprus' "Points' accumulation" table given in section D1 must be followed.

Table D2

Points	Other				
	Performance /Exhibition (Artist		Creative works		Workshop/Seminars/Festivals /Competitions/ Broadcasts/Residencies
	Music	Graphic Design/Visual Arts	Music	Graphic Design/Visual Arts	
5	**A01** Performance - National level (partial performance)	**A02** Participation in local group exhibition	**A03** Composition for up to 4 musicians		**A04** • National Performance or Broadcast of a composition/arrangement • Adjudication of Competition • Invited workshop / art lecture in national conference/festival
10	**A05** Performance - International level (partial performance) Part of ensemble studio recording/ less than 3 tracks	**A06** Participation in international group exhibition	**A07** Composition from 5-10 musicians	**A08** Publication design (national/international) - booklets covers	**A09** • International Performance or Broadcast of a composition/arrangement • Competition Finalist • Invited workshop / art lecture in international conference/festival • Invited Artist (Workshop)
15	**A10** Performance - National level (entire concert) Performance with Large Ensemble Part of ensemble studio recording/ more than 3 tracks	**A11** Editor of exhibition catalogue (national/international)	**A12** Composition for 10 musicians and above	**A13** Publication design (international) - books and exhibition catalogues	**A14A** • Competition Winner • Invited Artist (Festival – duration more than three days) **A14B** Chair of international arts/music festival

20	**A15** Performer – International level (entire concert) / Solo studio Recording (CD) less than 3 tracks	**A16** Participation in national solo exhibition	**A17** Composition for Symphonic Orchestra	**A18** Commissioned work by government/museum/ other cultural institution	**A19** Participation in funded international residency
25	**A20** Solo studio Recording (CD) more than 3 tracks	**A21** Participation in international solo exhibition	**A22** Publication of a composition (Score/CD) by an International Music Publishing House /Recording company	**A23** Project: Curation of national / international exhibition	

European University Cyprus

INTERNAL REGULATION ON

SABBATICAL LEAVE

73rd Senate Decision: 22 May 2020

Policy on Sabbatical Leave

1. Purpose

The objective of a Sabbatical Leave is to increase a faculty's value to the University and thereby improve and enrich its programs. Such leave is not regarded as a reward for service or as a vacation or rest period occurring automatically at stated intervals. Sabbatical leaves are granted for planned travelstudy, formal education, research, writing of papers, monographs and books or other experience of academic value.

A Sabbatical Leave, as distinguished from a terminal leave, a leave without compensation, or a leave for reasons of health, is defined at EUC as a leave for encouraging faculty members to engage in scholarly research and international networking that will increase their scholarly achievement or their capacity for service to the University internationalization policy. A Sabbatical Leave is not granted for taking regular academic or other employment with a financial advantage elsewhere.

2. Terms

A Sabbatical Leave is granted to a faculty member, beginning September 1, for the usual teaching terms (i.e., September to June complete) of one academic year (two semesters). However, as an alternative, a faculty member who has qualified for a full year of Sabbatical Leave may apply for such sabbatical to be divided into two terms falling within a six-year period, each such term representing one semester.

The cost of replacing a faculty member during Sabbatical Leave is to be kept as low as possible by arrangements such as rotating courses, employing part-time academic staff, and making internal adjustments in the academic Departments concerned. In all cases, the relevant School must give the final approval for the implementation of the Sabbatical Leave in a particular semester so that the smooth operation of the academic programs offered by the School is not affected by severe staff shortage.

3. Procedure for Granting a Sabbatical Leave

Application for a Sabbatical Leave should be made by the faculty member and submitted to the Department Chairperson no later than December 1, preceding

the academic year in which the leave will be carried out. The faculty member should submit the completed application form which will include a plan of activities during the Sabbatical Leave. Letters of acceptance from the institutions which will host the faculty member during his/her leave should also be attached.

The Department Chairperson must forward the application with an accompanying recommendation to the appropriate Dean by the following December 15. The recommendation shall include a statement of the proposed method of handling the normal duties of the faculty member while on leave.

The Dean must forward each application and the accompanying recommendation of the Department Chairperson, together with the Dean's own recommendation, to the Office of the Rector by January 15.

The Office of the Rector will forward all applications to the Chair of the Ad-hoc Committee which will evaluate the proposals. The Ad-hoc Committee will consist of the Vice-Rector of Research & External Affairs (chair), the Vice-Rector of Academic Affairs and the Director of Human Resources. The evaluation procedure for the awards is described in the following section.

4. Evaluation Procedure for the Sabbatical Awards

The Committee will decide each year the number of new sabbatical awards which will be made to the whole University. This will not be less than 3% of EUC faculty in the current academic year.

The Committee will determine the number of new sabbatical awards which will be made to each School in the current academic year. To do this, the Committee will consider the proportion of sabbatical leave awards which have been made to faculty members of each School of the University in the last three years including the current academic year. The Committee will ensure that with the new awards this proportion for each School does not deviate by more than 20% from its proportion of faculty members. Deviations exceeding 20% from these proportions may be allowed in the first three years of the implementation of the policy (starting academic year: 2020-21).

Once the number of new sabbatical awards to each School is determined, the Committee will select the applicant(s) from each School who have the highest number of points as calculated with the scheme described in Appendix A (below).

Applicants will be notified about the outcome of their application by March 15.

5. Sabbatical Leave and Sponsored Research

A faculty member is entitled to supplement the salary provided by the University during the period of leave with funding provided by an institutional, national or international source for academic activities.

6. Eligibility

Eligibility for a Sabbatical Leave is limited to full-time faculty members who have achieved tenure rights and who have completed six years of full-time service as faculty at European University Cyprus. In general, at least six years must elapse between consecutive sabbaticals.

At the end of a sabbatical leave, the faculty member should forward to the Department Chairperson and the Dean copies of a report on activities undertaken during the period of the leave.

Chairs of Departments, Deans of Schools, Vice-Rectors and the Rector are not eligible for a sabbatical leave award during their term of office.

Appendix A

Point calculation system for Sabbatical Awards

This Appendix describes the point calculation system which will be used for selecting the candidates in each School which will be awarded a Sabbatical Leave (see section 4).

The point calculation system awards points by considering the research activity of faculty in the past 5 years.

- Scopus document in the past 5 years: 30 points
- Scopus citations to documents published in the past 5 years: 2 points per citation
- Successful research proposals–National:

Principal investigator (PI) of the whole proposal	Local Coordinator of the proposal	Participant in the proposal
50 points	20 points	10 points

- Successful research proposals–European Union

Principal investigator (PI) of the whole proposal	Local Coordinator of the proposal	Participant in the proposal
100 points	40 points	20 points

Example: A faculty member published 3 Scopus papers in the past 5 years which have 10, 1, 3 Scopus citations respectively. He/she submitted one national proposal as a PI. What are his/her total points?

The total points are calculated as follows:

Papers: 3*30=90pts

Citations: (10+1+3)*2=28pts

Proposals: 50=50pts

Total points 90+28+50=168pts

Appendix 13

EUC Professional Development Program
There are currently three (3) academic staff professional development schemes organized, offered, evaluated and revised by the Office of the Vice-Rector of Academic Affairs

1. EUC Professional Development Program for its newly hired academic staff:

This is a 35-hour induction professional development program offered to all newly hired academic-staff. For new full-time academic staff this is compulsory, whereas is voluntary for part-time instructors. It is offered in three parts in September, January and June every year and it is annually revised based on the feedback provided by participants on the evaluation questionnaire delivered at the end of each part of the program. The content of the program focuses on various aspects on teaching and learning in tertiary education. Upon completion of the program, participants are granted a certificate of attendance and participation issued by the Office of the Vice-Rector of Academic Affairs (a sample is provided in Appendix D.9). Consideration is made for the external accreditation of the program as a Graduate Certificate in Tertiary Teaching.

Below you may see the program content and timetable as was provided in the academic-year 2020-21.

2. EUC Ongoing Professional Development Program

The EUC Ongoing Professional Development Program is addressed for both full-time and part-time academic staff and is offered throughout the year. Participation is voluntary. The content and topics for the program are decided based on:

a) The feedback and written evaluation of the EUC Professional Development Program for its newly hired Faculty (presented above), e.g.

- Testing, grading and evaluating in higher education
- Project based learning
- Assessment in small and large classes

b) Requests of contemporary issues and initiatives of the Schools and academic Departments, e.g.

- Playful Simulations in Higher Education Workshop
- From lecturing to engaging: examples of turning challenges into opportunities.

3. EUC Professional Development Program on Innovative Strategic Interventions

This consists professional development for both full-time and part-time academic staff on issues related to the introduction of

EUC/School/Department-wide innovations or on EUC/School/Department wide projects, e.g.:

- Programmatic, Departmental and Institutional Accreditation (2018-2021)
- Digital Enhanced Learning (DEL; 2018-2022)

These programs are mainly workshop-type and might include action research and reflection activities.