



# **ASIIN Seal & Euro-Inf<sup>®</sup> Label**

## **Accreditation Report**

**Bachelor's Degree Programme**  
***Information Technology***

Provided by  
**Eastern Mediterranean University, Famagusta,**  
**North Cyprus**

Version: 13 April 2017

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## A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for <sup>1</sup>	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) <sup>2</sup>
Ba Information Technology		ASIIN, Euro-Inf® Label	ASIIN, Euro-Inf® Label 28.06.2011- 30.09.2016	04
<p><b>Date of the contract:</b> 11.07.2016</p> <p><b>Submission of the final version of the self-assessment report:</b> 01.09.2016</p> <p><b>Date of the onsite visit:</b> 27.-28.10.2016</p> <p><b>at:</b> Eastern Mediterranean University, School of Computing and Technology, Department Information Technology</p>				
<p><b>Peer panel:</b></p> <p>Wisdom Onyeka David, Student at Girne American University;</p> <p>Prof. Dr. Bettina Harriehausen-Mühlbauer, Hochschule Darmstadt;</p> <p>Prof. Dr. Jörg Keller, FernUniversität Hagen;</p> <p>Seniha Semen Öztemiz Tulgar, Network and Systems Group Officer, Middle East Technical University Northern Cyprus Campus</p> <p>Guest from European Quality Assurance Network for Informatics Education (EQANIE):</p> <p>Prof. Dr. Juergen Dorn, TU Wien, Austria;</p> <p>Prof. Dr. Johann Gamper, Free University of Bozen-Bolzano;</p> <p>Prof. Dr. Mark Harris, InnoVaventures UG, EQANIE Accreditation Committee;</p>				

<sup>1</sup> ASIIN Seal for degree programmes; Euro-Inf®: Label European Label for Informatics

<sup>2</sup> TC: TC 04 – Informatics/Computer Science)

## A About the Accreditation Process

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Dipl.-Kulturw. Jana Möhren; Secretary General of EQANIE	
<b>Representative of the ASIIN headquarter:</b> M.A. Madlen Schweiger	
<b>Responsible decision-making committee:</b> Accreditation Commission for Degree Programmes	
<b>Criteria used:</b>  European Standards and Guidelines as of May 2015  ASIIN General Criteria, as of 28.03.2014  Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science as of 09.12.2011	

## B Characteristics of the Degree Programme

a) Name	b) Final degree (original/English translation)	c) Corresponding level of the EQF <sup>3</sup>	d) Mode of Study	e) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Information Technology	B.Sc.	6	Full time	8 Semester	240 ECTS (138 EMU Credits)	Fall semester, fall semester 1994

For the **Bachelor's degree programme Information Technology** the institution has presented the following profile on the programme-specific website and in the self-assessment report:

„The aim of the Information Technology programme is to equip students with a strong foundation in IT related fields. The programme focuses on satisfying the needs of users within an organizational and societal context through the selection, creation, application, integration and administration of computing technologies. The programme, not only has been designed to provide a balanced education between the theoretical and practical concepts required for each module, it also focuses on the importance of team working and implements team-based projects for this purpose. The educational objectives of the IT programme are listed as shown below.

Graduates:

- are prepared for careers and/or graduate education (second cycle) in the IT field as it applies to software analysis and design, system development, web and multimedia applications, computer architecture, and computer networks.
- have a high quality education in state of the art in programming, system analysis and design, database development and administration, web and multimedia based design and development, and computer architecture, which incorporate open-ended design experiences and the use of hardware and software tools.

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<sup>3</sup> EQF = The European Qualifications Framework for lifelong learning

- develop skills for effective verbal and written communication, and for participating effectively in the planning and execution of team-based projects, and to foster professional attitudes and awareness of the benefits of life-long learning.
- have a learning environment that is based on open interaction with experienced staff and a curriculum that follows the latest developments in IT field with strong analytical and critical thinking skills as well as practical knowledge compatible with business requirements.”

## C Peer Report for the ASIIN Seal<sup>4</sup>

### 1. The Degree Programme: Concept, content & implementation

<b>Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)</b>
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**Evidence:**

- Objective-module Matrix in the self-assessment report (hereinafter: SAR)
- Programme objectives/learning outcomes also available on the internet (access on November 9<sup>th</sup> 2016): <http://ww1.emu.edu.tr/en/programs/information-technology-undergraduate-program/925>
- Diploma Supplement
- Discussions during onsite visit

**Preliminary assessment and analysis of the peers:**

The peers based their analysis of the programme objectives and intended learning outcomes on the self-assessment report, the programme-specific website as well as the discussions with the representatives of the university. The peers referred to the *Subject-Specific Criteria (SSC)* of the ASIIN Technical Committee for Informatics/Computer Science as a basis for judging whether the intended learning outcomes of the Bachelor's degree programme correspond to the exemplary learning outcomes of the ASIIN Technical Committee. The panel came to the following conclusions:

The learning outcomes specify that graduates should be able to apply theoretical knowledge, core IT concepts and standards to Information Technologies. Additionally, students should be able to analyze problems, and identify and evaluate organizational requirements with current and emerging technologies. The peers concluded that this corresponds to the aim to develop a sound knowledge in *concepts, theories and mathematical methods relevant to computing* and to *analysis competences* such as to describe a problem and its solution at varying levels of abstraction and to select and use relevant analytic, modeling and simulation methods. The panel could also see that competences in *informatics design and implementation* shall be reached as the intended learning outcomes

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<sup>4</sup> This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

state that students shall be able to select, design, integrate and administer IT-based solutions within an organizational environment by using strong analytical and critical thinking skills as well as practical knowledge within the field of IT. Regarding *economic, legal, social, ethical and environmental aspects of informatics practice*, the peers acknowledged that graduates should be enabled to describe the impact of IT solutions in a global, societal, and ethical context and should be able to use practical skills which are compatible with business requirements. In addition, students should gain the competences to follow the latest developments within the field of IT. Furthermore, students are expected to acquire a number of further *social competences* including communication skills, the ability to participate effectively in the planning and execution of team-based projects as well as the ability to keep learning and training during their lifetime.

Overall, the peers verified that the presented learning outcomes of the Bachelor's degree programme Information Technology are in line with the *Subject Specific Criteria* defined by the ASIIN Technical Committee for Informatics/Computer Science. The SSC of the Technical Committee are closely linked to the Euro-Inf<sup>®</sup> framework criteria<sup>5</sup>; consequently, the analysis of the *Subject Specific Criteria* encompasses the Euro-Inf<sup>®</sup> criteria. The Euro-Inf<sup>®</sup> Label is a quality certificate for informatics degree programmes and is recognized Europe-wide. The peers confirmed that the Euro-Inf<sup>®</sup> Standards regarding the intended learning outcomes are largely fulfilled by the Bachelor's programme Information Technology. In addition, the academic level of the programme can be clearly deduced, being in full compliance with the standards of the EQF levels 6 for Bachelor's graduates.

The evaluation of the achievements of the educational objectives and learning outcomes is conducted every two years. This process is managed by the IT Quality Management Committee which uses the collected data from the curriculum and learning outcome surveys as well as the employers and alumni surveys in order to evaluate the Information Technology degree programme. The peers confirmed that all relevant stakeholders are included in the process of formulating and further developing the objectives and learning outcomes.

<b>Criterion 1.2 Name of the degree programme</b>
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**Evidence:**

- Programme-specific website (access on November 9<sup>th</sup> 2016):  
<http://ww1.emu.edu.tr/en/programs/information-technology-undergraduate-program/925>

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<sup>5</sup> <http://www.eqanie.eu/pages/quality-label.php>



**Preliminary assessment and analysis of the peers:**

The peers considered the name of the programme – Information Technology – to adequately reflect the intended objectives and curriculum as currently on offer. They also found it to be in line with common international usage. The programme is taught in English.

<b>Criterion 1.3 Curriculum</b>
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**Evidence:**

- Objective-module matrix in the SAR
- Curriculum of the programme on the website (access on November 9<sup>th</sup> 2016):  
<http://ww1.emu.edu.tr/en/programs/information-technology-undergraduate-program/925?tab=curriculum>
- Course descriptions on website (access on November 9<sup>th</sup> 2016):  
[http://ww1.emu.edu.tr/emu\\_v1/media/assets/files/pages/it-modules-handbook-2016.pdf](http://ww1.emu.edu.tr/emu_v1/media/assets/files/pages/it-modules-handbook-2016.pdf)
- Discussions during onsite visit

**Preliminary assessment and analysis of the peers:**

The curricular content was assessed with regard to its contribution to the programme learning outcomes and educational objectives, also in light of the *Subject-Specific Criteria*, and the level of education sought.

The peers confirmed that roughly 20% of the curriculum is composed of the mathematical and informatics foundations (e.g. “Information Technology Fundamentals”, “Algorithms and Programming Techniques”, “Basic Mathematics”, “Discrete Mathematics for Information Technology”, “Structured Programming”, “Introduction to Statistics”) in order to provide students with *knowledge in concepts, theories and mathematical methods* relevant for Information Technology. However, with regard to the learning outcome “to equip students with the theoretical background and core IT concepts relevant for Information Technology” it seemed that the scientific fundamentals of computability or computability in polynomial time are not reflected in the curriculum. As students should be able to work in business, where most of the interesting problems (like route or work planning, resource allocation etc.) are NP complete, the peers considered this fundamental knowledge as essential to prepare students for their future careers. Although, mentioned literature (Cormen/Leiserson/Rivest) in the module description of the course “Analysis of Algorithms” includes a chapter about NP-completeness, these contents are not explicitly mentioned in the module description. The peers learned during the onsite discussions that above mentioned knowledge in theoretical informatics is taught in the second week of

the course “Analysis of Algorithms” under the topic “Growth of functions”. The peers pointed out that according to this topic title they would not have expected that computability/computability in polynomial time is taught. Therefore and due to the fact that the peers are convinced that these topics are actually taught in an adequate extent, the module description should be revised in terms of the impartation of computability/computability in polynomial time and NP completeness.

The curriculum is composed of further mandatory area courses (“Database Management Systems”, “Data Structures and Applications”, “Human Computer Interaction”, “Client-Side Internet and Web Programming”, “Computer Organization and Architecture”, “Operating Systems”, “Database Programming”, “Rich Internet Application (RIA) Development”, “Object Oriented Programming”, “Digital Logic Design”, “Computer Networks – I and II”, “System Analysis and Design”, “Software Engineering” etc.) in the second, third and fourth year of the study programme where students gain adequate competences in *analysis, informatics design and implementation*. Issues on IT-Security are theoretically stressed in the modules “Information System Security” and “Cryptography and Network Security”. However, the peers would like to mention that students expressed the wish to have a more practical approach to these topics. The peers confirmed that *informatics practice* and *social competences* are supported by laboratory work, term projects in teams, the industrial training (internship) and the graduation project. The peers acknowledged that the recommendation from the previous accreditation to embed a sizable software engineering project in the curriculum is implemented in the graduation project in the first and second semester of the final year (see also criterion 2.3 and 3). The peers discussed with the programme coordinators how the students acquire the knowledge and competences in order to achieve the intended learning outcome “[to] describe the impact of IT solutions in a global, societal, and ethical context”. They learned that the module “Ethical and Social Issues in IT” is mandatory for the students of the Bachelor’s degree programme Information Technology and that students are encouraged to take further elective courses on these topics. Overall, the peers assessed that *economic, legal, social, ethical and environmental aspects of informatics practice* are adequately reflected in the curriculum.

The graduation project (see criterion 3) was intended to prove that students have the knowledge and capacity to work individually on research and development tasks using scientific methods. The peers wondered if any learning unit, teaching form or assessment method prior to the graduation work appropriately familiarizes students with independent academic research methods and writing scientific papers. For instance, this might be achieved through writing scientific reports on conducted projects or by implementing an

additional seminar in an earlier stage of the study plan. However, it is up to the university which measures might be taken.

#### **Criterion 1.4 Admission requirements**

##### **Evidence:**

- Admission requirements on website (access on November 9<sup>th</sup> 2016):  
<http://ww1.emu.edu.tr/en/prospective-students/admission-requirements/undergraduate-programs/1292>
- Discussions during onsite visit

##### **Preliminary assessment and analysis of the peers:**

The panel analysed and discussed with the representative of the higher education institution (HEI) the effect of the admission requirements on the programme implementation. They learned that the entrance and admission requirements for the Bachelor's programme Information Technology differ according to the nationality of the applicant. For students from Turkey, they are regulated by the Student Selection and Placement Center which carries out centrally administered exams. Students from North Cyprus undergo a similar exam organized by EMU. Applicants from other countries are evaluated by the university's Registrar's office based on the average high school graduation score and additional requirements in the respective countries. Additionally, all students have to prove English language skills through a minimum grade from a TOEFL (ITB 75) or similar test. The peers wondered whether the relatively low English language score might be related to the rather high drop-out rate. However, they came to the conclusion that the level of the students' language skills is adequate and other circumstances cause the drop-out rates (see criterion 2.2). The peers positively acknowledged that the HEI offers an English preparatory school in order to improve English language skills, if necessary. The peer group found that the first year of studies – composed of scientific, general and English language courses – is mainly used to bring all students up to the same level which they found sensible in order to attain an overall satisfactory level of studies. In summary, they gained the impression that the applicable regulations are adequate, transparent and accessible to all stakeholders involved.

##### **Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:**

The peers welcome that contents of the "Analysis of Algorithms" course have been revised by the HEI and that the respective module description have been updated to reflect the details of all topics including the impartation of computability/computability in polynomial time and NP completeness. Similarly it was acknowledged that the programme

coordinators intend to introduce more practical approaches on IT courses and to improve the necessary infrastructure. It was further appreciated by the panel that the responsible programme curriculum committee and graduation project committee plan to introduce additional seminars in order to familiarize the students with independent academic research methods and writing scientific papers, within the early stages of the ITEC403 graduation project. Hence, the peers came to the conclusion that the HEI has largely fulfilled the respective criteria. Nevertheless, they stuck to their recommendation to further familiarize the students with independent academic research and writing in an earlier stage of the curriculum.

## 2. The degree programme: structures, methods and implementation

<b>Criterion 2.1 Structure and modules</b>
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### Evidence:

- Objective-module matrix in the SAR
- Curriculum of the programme on the website (access on November 10<sup>th</sup> 2016): <http://ww1.emu.edu.tr/en/programs/information-technology-undergraduate-program/925?tab=curriculum>
- Course descriptions on website (access on November 10<sup>th</sup> 2016): [http://ww1.emu.edu.tr/emu\\_v1/media/assets/files/pages/it-modules-handbook-2016.pdf](http://ww1.emu.edu.tr/emu_v1/media/assets/files/pages/it-modules-handbook-2016.pdf)
- International Office (access on November 10<sup>th</sup> 2016): <http://io.emu.edu.tr/en>
- Eastern Mediterranean University By-Law for Postgraduate Studies and Examination, also available on the website (access on November 10<sup>th</sup> 2016): [http://mevzuat.emu.edu.tr/5-1-6-Rules-Taking\\_courses\\_outside\\_the\\_university.htm](http://mevzuat.emu.edu.tr/5-1-6-Rules-Taking_courses_outside_the_university.htm)
- Statistical data about student progression, intake and dropout rates
- Discussions during onsite visit

### Preliminary assessment and analysis of the peers:

The peers considered the structure of the programme to be sensible and the modules (courses) on offer to constitute adequate teaching and learning units. Over the last six years it seems that the coordination with the mathematics department has been improved as the modules imported from the mathematics department are better tailored to the needs of the IT programme than in the course of the previous accreditation. Based on the analysis of the sequence of modules and the respective module descriptions, the peers concluded that the structure of the degree program ensures that the learning outcomes as well as the qualification level can be reached. The study programme offers two specializations “Software Development Track” and “Web Application Track” including a number of elective courses which allow students to set an individual focus. The panel positively noted that students are provided with sufficient information about the specialization tracks and that they seemed very satisfied with the structure and the content of the study programme.

During the discussions, the panel also acknowledged the system of updating the curriculum. The Curriculum Committee is in charge of updating the curriculum by comparing the curriculum with ACM standards<sup>6</sup>, new trends and intended learning outcomes. The panel was convinced that these mechanisms ensure that the modules are consistent within themselves, are matched against each other, build upon each other and consequently, viewed all together, achieve the intended academic level.

The Bachelor's degree programme Information Technology prepares students well for the professional life by different means: The practical approach of the study programme is reflected in the laboratory work, term projects and the graduation project (see also criterion 3) which is usually related to practical issues of the professional life. In order to obtain the Bachelor's degree students carry out a summer training (internship) in an IT company/institution with a minimum period of 40 days and have to present a practice report which is checked against the employers feedback. The peers learned that due to the diverse nationalities of the students most summer trainings are carried out in their respective home countries. However, the department established and maintains cooperations with companies in North Cyprus in case students face difficulties in finding a placement. The peers confirmed that the HEI vouches for the quality of the internships in terms of relevance, content and structure.

Rules for the recognition of achievements acquired outside the university are stipulated on a general basis in the By-Law for Education, Examinations and Success, in particular in "Regulations for Exemptions and Equivalency" and the "By-Law for Taking Courses from Another Institution". These rules stipulate that students can be exempt from courses when they have achieved competences. However, the panel acknowledged that international exchange and mobility were not at the forefront of the programme under review as the great majority of students come from outside the country. Nevertheless, in principle the university encouraged international exchange and mobility and therefore, has built up a good network of international cooperation's.

## Criterion 2.2 Workload and credits

### Evidence:

- Course descriptions on website (access on November 10<sup>th</sup> 2016):  
[http://ww1.emu.edu.tr/emu\\_v1/media/assets/files/pages/it-modules-handbook-2016.pdf](http://ww1.emu.edu.tr/emu_v1/media/assets/files/pages/it-modules-handbook-2016.pdf)
- Statistical data about student progression, students workload, intake and dropout rates

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<sup>6</sup> <http://www.acm.org/education/curricula-recommendations>

- Discussions during onsite visit

**Preliminary assessment and analysis of the peers:**

The university works with its own credit point system, so-called EMU credits. Additionally, ECTS credit points are provided as a reference. Since EMU credits are mostly contact-hour based, no direct correlation between the two systems exists. Between 27 and 34 ECTS (15-20 EMU credits) are awarded per semester. The Bachelor's project is weighted with 9 ECTS. The allocation of ECTS credit points to individual modules is based on a workload planning sheet which has been completed for each module. The peers particularly valued that the detailed workload planning (including lectures, practical sessions and self-study periods) is verified against the results of the student surveys at the end of each semester where students' workload data are collected. Furthermore, the university made plausible that measures would be implemented in case a too high workload was discovered, e.g. by reducing the number of assignments. The peers highly appreciated that the recommendation of the previous accreditation to monitor the actual students' workload has been implemented and adjusted, if necessary (see also criterion 6). For the time being, the overall students' workload seems to be calculated realistically and in a way that avoids structure-related peaks in the workload, as the students confirmed in their oral statements.

The study programme is designed to be completed within four academic years. It seemed to the peers that the statistical data provided is contradictory; showing that the intake per academic year is much higher than the amount of graduates after four years, while the students' progression statistics states that they are able to finish their studies earlier than the regular study period of four years. During the discussions with the programme coordinators and students the peers learned that students may take up to 3 courses during the summer (vacation) period and one additional course per semester if their GPA is high and therefore, it is possible to finish the study programme in less than 4 years. On the other hand, many students have to "freeze" a semester due to financial issues which prolongs the overall study period. The peers found this explanation plausible and confirmed that according to the programme structure/workload it is possible to complete the study programme without exceeding the regular course duration.

<b>Criterion 2.3 Teaching methodology</b>
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**Evidence:**

- SAR
- Course descriptions on website (access on November 10<sup>th</sup> 2016):  
[http://ww1.emu.edu.tr/emu\\_v1/media/assets/files/pages/it-modules-handbook-2016.pdf](http://ww1.emu.edu.tr/emu_v1/media/assets/files/pages/it-modules-handbook-2016.pdf)

- Discussions during onsite visit

**Preliminary assessment and analysis of the peers:**

The teaching staff of the department uses a range of educational methods and training tools which reflect the good practices of teaching by involving theory classes, lab work, tutorials, teamwork-projects, presentations, analysis and problem solving tasks in the every day's teaching activities. Also the labs, which are well equipped (see also criterion 4.3), allow for adequate and state-of-the-art teaching. The students were also satisfied with the teaching in general. Overall, the panel considered the teaching methods used for implementing the didactical concept as appropriate and the ratio of contact hours to self-study time seems to support the achievement of the intended learning objectives.

<b>Criterion 2.4 Support and assistance</b>
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**Evidence:**

- SAR
- Results of graduates survey in SAR
- Student handbook (access on November 10<sup>th</sup> 2016):  
[http://ww1.emu.edu.tr/emu\\_v1/media/assets/files/pages/it-student-handbook-2015.pdf](http://ww1.emu.edu.tr/emu_v1/media/assets/files/pages/it-student-handbook-2015.pdf)
- Discussions during onsite visit

**Preliminary assessment and analysis of the peers:**

The relation between lecturers and students was considered to be one of the strong points of the programme. The peers recognized that lecturers were found to be always accessible and helpful for students, also outside of the designated weekly opening hours. All lecturers were engaged and motivated to ensure a good implementation of the programme.

With regard to providing information and help to the students, all information was made available on the departments' website. Furthermore, lecturers also function as advisors who advise and approve students' choices of electives thus ensuring a meaningful composition of the individual course schedules.

**Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:**

The peers considered these criteria as completely fulfilled.



### 3. Exams: System, concept and organisation

<b>Criterion 3 Exams: System, concept and organisation</b>
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**Evidence:**

- Course descriptions on website (access on November 10<sup>th</sup> 2016):  
[http://ww1.emu.edu.tr/emu\\_v1/media/assets/files/pages/it-modules-handbook-2016.pdf](http://ww1.emu.edu.tr/emu_v1/media/assets/files/pages/it-modules-handbook-2016.pdf)
- Graduation projects on website (access on November 10<sup>th</sup> 2016):
  - <http://courses.sct.emu.edu.tr/courses/it/index.php?id=itec403>
  - <http://courses.sct.emu.edu.tr/courses/it/index.php?id=itec404>
- Examination rules (access on November 10<sup>th</sup> 2016): [http://mevzuat.emu.edu.tr/5-1-4-Rules-examinations\\_and\\_evaluations.htm](http://mevzuat.emu.edu.tr/5-1-4-Rules-examinations_and_evaluations.htm)
- Student handbook (access on November 10<sup>th</sup> 2016):  
[http://ww1.emu.edu.tr/emu\\_v1/media/assets/files/pages/it-student-handbook-2015.pdf](http://ww1.emu.edu.tr/emu_v1/media/assets/files/pages/it-student-handbook-2015.pdf)
- Discussions and review of documentation during onsite visit

**Preliminary assessment and analysis of the peers:**

The examination practice in place is described clearly and transparently in the syllabi, including the examination forms, the weighting of the examination parts as well as the calculation of the final grade. The evaluation methods include, depending on the subject and the expected module learning outcomes, mid-term and final exams as well as additional quizzes and assignments. While the majority of exams are written, students' performance in presentations or group tasks also contributes to the module's grades. The peers assessed that the examination methods in comparison to the previous accreditation now better reflect the intended learning outcomes of the modules; they encouraged the department to further monitor the matching of assessment methods and intended learning outcomes.

Regarding the organization of the examinations the students seemed very satisfied and the peers acknowledged that the examination schedule is designed centrally by the university. However, in order to finally assess if the number and distribution of the exams ensure that both the exam load and preparation time are adequate the faculty is asked to provide examination schedules from the last 4 semesters including mid-term and final-exams. The peers confirmed that adequate rules have been defined for re-sits, disability compensation measures, illness and other mitigating circumstances. If a student fails an exam no re-examinations are offered. However, students may register again in the next

semester or have the possibility to take up to 3 courses during the summer period. The peers found these rules acceptable as it seems that the missing make-up exams do not cause delays in the students' progression.

During the visit, the peers analyzed a number of exam papers and gained the impression that the academic level was adequate.

The Bachelor's degree programme Information Technology comprises a graduation project which is carried out by a team of three to four students over the first and second semester of the final year. The peers learned during the onsite discussions that students work on real life information technology projects; In the first semester of the graduation project, which counts 3 ECTS, students should analyze and identify the requirements of their project and according to these specifications the systems design and development process will be executed. At the end of the first semester students submit their preliminary graduation project report and present their project orally. In the second semester of the graduation project, which counts 6 ECTS, students are required to implement their project and present it to a jury which is formed by the graduation project committee. The final submission includes functional software / hardware package, user and system reference manuals and a final report which includes all the details of the procedures, performance checks, and testing results. The review of the graduation project samples provided did convince the peers only to some extent; in terms of depth of study the graduation projects do not fully correspond to the international standards on scientific research work at EQF level 6 (Bachelor's level). The content and the volume seemed rather adequate; however the peers missed the scientific contribution especially, the academic research on the respective topic by including a literature survey/review and a citation index of utilized bibliography. Reviewing the relevant literature to a given field is a standard part of doing research, as this serves to put work into the context of the larger discipline. Referring to the aim of the programme "to prepare for graduate education (second cycle)", the peers pointed out that an adequate graduation project should include above mentioned aspects at the Bachelor's level of qualification. Furthermore, the aim of a graduation project should be that the individual student proves that he/she is capable to carry out an assigned research task independently. While carrying out graduation projects in groups seems principally acceptable as group work contributes to the development of transferable skills like team work and management skills, the peers wondered how the individual contribution of each team member could be assessed. The peers understood that 40% of the final mark is composed of individual grading; however these 40% only include the oral performance of the student as the written documentation (report, manuals etc.) is jointly graded. The peers underlined that a final project was intended to prove that students have the knowledge and capacity to work autonomously on research and development

tasks using scientific methods. Therefore, the peers would expect that individual grading of the group projects is based first and foremost, on the written documentation and not exclusively on oral performance. For this reason the peers recommended that the individual grading should be based in addition to the oral performance on the written documentation. Furthermore, it is recommended that students should implement final projects individually to foster the competence to work individually on a set task of research. Group work should be maintained in other projects.

**Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:**

The peers appreciated that the examination schedules and academic calendars for the last 4 semesters were made available to them. From the comments of the HEI they understood that the programme curriculum committee and graduation project committee are eager to enhance the students' abilities of independent academic research methods and scientific writing, preparing them for the preparation of the graduation project. They learned that a literature survey/review and a citation index of utilized bibliography will be included to deepen the academic research on graduation projects. Nevertheless, the peers held up their requirement that this modification shall be properly introduced and its results documented by the HEI.

The HEI explained that for the individual assessment of a student's part in the graduation project an evaluation form has been introduced within the last semester. According to the results of these analyses, the grading policy of the graduation projects can be modified in such a way that the individual grading of a student will be based first and foremost on the written documentation, in addition to the oral examination as recommended by the peers.

However, the HEI affirmed that the graduation project as a group task is considered to be an important element for the students to demonstrate the ability to participate effectively in the planning and execution of team-based projects as well as to foster professional attitudes and awareness of the benefits of life-long learning. Notwithstanding, the HEI will consider the recommendations made by the panel on assigning independent research tasks.

Consequently, the peers considered the requirements and recommendation related to these criteria as not yet fulfilled.

## 4. Resources

#### Criterion 4.1 Staff

**Evidence:**

- CVs of staff in SAR
- Discussions during onsite visit

**Preliminary assessment and analysis of the peers:**

As indicated previously in this report (criterion 2.4), the relation between lecturers and students was considered to be one of the strong points of the programme. Furthermore, the peers considered that the staff composition was suitable to carry out the programme as planned. In particular, the English competences of lecturers were suitable to implement the programme fully in English. 80% of the teaching staff members have a permanent contract; in addition, the faculty is supported by part-time lecturers from the industry. However, the peers noticed a comparatively high teaching load of about 12-14 hours for a full-time lecturer / assistant professor, which sums up easily to 20 hours per week as two lab hours count only for 1 hour teaching load. This university-wide rule which applies to all faculties has a negative impact on the teaching staff of the IT department as the applied approach of the Bachelor's degree programme Information Technology implies many laboratory hours. Furthermore, the relatively small number of teaching assistants implicates that laboratory work is mostly conducted by the full-time lecturers/ass. professors. In addition to the lecturers, two technical staff members are available for the maintenance of the computer laboratories, however teaching staff is involved in these tasks which even increases the overall workload. Consequently, the peers determined that staff members found it hard to balance their teaching and administrative obligations with time for research. The peers acknowledged that staff members, despite of their high teaching load and administrative tasks, endeavoured to implement research activities and to involve students in their research projects. Nevertheless, the peers recommended to further support staff members in their professional development and research activity e.g. by reducing the teaching load and by increasing the number of technical and lab assistants.

#### Criterion 4.2 Staff development

**Evidence:**

- SAR
- Discussions during onsite visit

**Preliminary assessment and analysis of the peers:**

The peers considered that staff members principally have access to and make use of further education offers. The teaching staff trainings include certification courses (e.g. Ora-

cle, Cisco, and Microsoft) and seminars on teaching methodologies. It was also confirmed that financial support was provided for attending conferences internationally and that, in principle, the opportunity for sabbaticals was provided. Nevertheless, of the staff members involved in the programme under review, no one had been able to make use of sabbaticals. As indicated above, the peers encouraged the university to further support the teaching staff in conducting research which would benefit the study programme development on the same time.

#### **Criterion 4.3 Funds and equipment**

##### **Evidence:**

- SAR
- Information about computer center on website (access on November 11<sup>th</sup> 2016):  
<http://ww1.emu.edu.tr/en/services/computer-center/c/720>
- Information about library on website (access on November 11<sup>th</sup> 2016):  
<http://library.emu.edu.tr/>
- Overview of cooperation agreements in SER
- Visit of facilities and discussions during onsite visit

##### **Preliminary assessment and analysis of the peers:**

The budget of the university stems from both student fees and state funds, the latter from North Cyprus as well as Turkey. Distribution among the faculties, departments and schools is made by the university administration (rector, executive board) based on the respective needs. The peers convinced themselves that the funding for the programme under review was adequate. The resources for teaching and learning, in particular classrooms, computer rooms, laboratories and library were considered to be sufficiently well equipped. In particular, the panel commended that students had access to the hard and software in the labs around the clock when requested. They also confirmed that access to the necessary software resources and library access was possible also from their private computers.

##### **Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:**

From the comments of the HEI the peers learned that new technical staff has been requested from the rector's office with an official letter in July 2016, but no technical staff has been assigned yet. They understood that the programme responsables are fully aware of the insufficient personnel required to manage and maintain the computer laboratories. The involvement of teaching staff in the maintenance of these laboratories is generally

laudable but cannot be seen as a permanent solution to the short-comings in staff. Hence, the peers kept up their recommendation to further increase the number of technical and lab assistants.

## 5. Transparency and documentation

### Criterion 5.1 Module descriptions

**Evidence:**

- Course descriptions on website (access on November 10<sup>th</sup> 2016):  
[http://ww1.emu.edu.tr/emu\\_v1/media/assets/files/pages/it-modules-handbook-2016.pdf](http://ww1.emu.edu.tr/emu_v1/media/assets/files/pages/it-modules-handbook-2016.pdf)

**Preliminary assessment and analysis of the peers:**

The peers noted that the module descriptions were, in principle, available online to the relevant stakeholders. However, the module descriptions for the summer training (ITEC400) and the graduation project (ITEC403 and ITEC404) were missing in the published module handbook on the website. In terms of transparency these descriptions should be added.

Overall, the module descriptions were considered encompassing and altogether adequate to describe the intended learning outcomes as well as the content of the respective courses. However, the peers identified some inconsistencies; e.g., the methods of assessment sums up to 110% in the module description for “Information System Security” (ITEC413) and as already mentioned under criterion 1.3. the module description for “Analysis of Algorithms” (ITEC415) missed the imparted content on polynomial time computability vs. NP completeness. In addition, the stated workload does not always correspond to ECTS credits provided (e.g. ITEC114, ITEC122, ITEC309, ITEC310, ITEC317, ITEC318, ITEC429, ITEC499, ITEC 403). Especially, the calculation of the first semester of the graduation project seems unrealistic with 3 ECTS credits considering the amount of student work. In general, it seems that the module descriptions are less outcome-oriented formulated by using very often words as “describe”, “list” and/or “has knowledge”.

### Criterion 5.2 Diploma and Diploma Supplement

**Evidence:**

- Sample of leaving certificate
- Sample of Transcript of Records

- Sample of Bachelor programme Diploma Supplement

**Preliminary assessment and analysis of the peers:**

The peers confirmed that after graduation, a diploma or degree certificate is issued together with a Diploma Supplement printed in English. The Diploma Supplement provides information on the student's qualifications profile and individual performance as well as the classification of the degree programme with regard to its applicable education system. In detail, the Diploma Supplement provides information about the learning objectives, structure, content and level of the studies, the success of the graduate as well as about the composition of the final grade. However, in addition to the final mark, statistical data according to the ECTS-User's guide which allow readers to categorize the individual result (relative ECTS grade) should be added.

<b>Criterion 5.3 Relevant rules</b>
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**Evidence:**

- Rules and Regulations on website (access on November 10<sup>th</sup> 2016):  
<http://mevzuat.emu.edu.tr/Content-en.htm>
- Eastern Mediterranean University By-Law for Postgraduate Studies and Examination, also available on the website (access on November 10<sup>th</sup> 2016):  
[http://mevzuat.emu.edu.tr/5-1-6-Rules-Taking courses outside the university.htm](http://mevzuat.emu.edu.tr/5-1-6-Rules-Taking%20courses%20outside%20the%20university.htm)

**Preliminary assessment and analysis of the peers:**

The peers acknowledged that all rules and regulations governing the student life cycle, i.e. admission, progression and graduation were transparently published on the university's website in English.

**Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:**

The peers acknowledged the revision of the module descriptions according to their comments regarding among others the modules ITEC114, ITEC122, ITEC309, ITEC310, ITEC317, ITEC318, ITEC429, ITEC499, ITEC413 and ITEC415. The missing module descriptions for ITEC400, ITEC403 and ITEC404 were also included. It was understood that changes are being introduced to ITEC403 aiming to include literature survey/review and a citation index of utilized bibliography, making a re-consideration of the assigned ECTS credits by the related committees necessary. In consequence, the peers considered this criterion as completely fulfilled.

Concerning the Diploma Supplement the peers learned that an official letter about adding the required extra information has been sent to the Rectors office. Since the modification of diploma supplements requires the approval of the University senate which will take some time the peers needed to keep up their requirement until an extended version of the Diploma Supplements can be presented.

## 6. Quality management: quality assessment and development

### Criterion 6 Quality management: quality assessment and development

#### Evidence:

- SAR
- Results of graduates, alumni and employer survey in SAR
- Sample questionnaires in SAR
- Discussions during onsite visit

#### Preliminary assessment and analysis of the peers:

The quality assurance activities are led and implemented by the Quality Management Committee at School level. It reports to the university level University Board for Quality Coordination and Evaluation and its academic units. While at the School level, it was understood that the composition consisted only of teaching staff, the university commission includes representatives from the student body as well as the business partners. The quality management system principally consists of conducting a number of surveys – of students, graduates and employers, as well as of the collection of statistical data about student numbers, composition of the student body, drop-out and graduation rates. Planned changes to the curriculum are decided by the Curriculum Committee at School level and subsequently have to be approved by the University Board.

At the end of each semester, students fill out so-called instructor and course evaluations focussing on the implementation of the course per se and the quality of the lecturers but also other issues such as workload. From the survey results, a report is generated which is discussed in the Quality Committee as well as by the Director and the respective staff members. The panel learned that students are usually not informed about the results of the surveys. While some lecturers share results out of their own initiative, it is generally found hard to do so as evaluations only take place after the final exams and students might not return to the same lecturer within the duration of the programme. The peers raised the issue of closing feedback loops, i.e. the last step in a quality circle which would



consist of informing all participants in teaching and learning about quality management outcomes. Even if students are represented in the different committees the peers recommended that students should be systematically informed about the results of surveys in order to close feedback loops.

The peers acknowledged that the additional surveys, i.e. those of graduates and employers, focussing on the actual achievement of intended learning outcomes, contribute to the further development and effectiveness of the quality management system. Overall, the peers considered that the quality assurance system improved compared to the previous accreditation and that the former recommendations regarding the quality management system and the further development of the programme by taking into account input from all relevant stakeholders were implemented.

Overall, the peers judged the Quality Assurance System to be sophisticated and to incorporate relevant processes for the successful implementation and development of the programme. Solely, the rather poor employment records of graduates raised concerns about either the responsiveness of the programme to the job market or the employability of the graduates. The peers learned that within one year 80% find a job, while 20% of the students are unemployed. According to the programme coordinators the unemployment rate of the students seems comparable to the overall unemployment rate in the respective country (Middle East, Africa). In addition to the economical situation, political circumstances especially in the Middle East might be reasons as well. The peers followed this argumentation only to some extent, as in their perception graduates from information technology programmes are highly demanded, especially due to the digital transformation of the industry. As a consequence, the peers recommended assessing the reasons for the rather high unemployment rate of the graduates and if necessary, adequate measures should be implemented to ensure the responsiveness of the programme to the demand of the job market.

**Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:**

The peers gathered from the comments of the HEI that a request has been made to move up the evaluation process thus collecting data during the semester in order to allow for a detailed feedback on the survey results to the students thereby closing the feedback loops. They welcome the encouragement given to staff members to ask for informal feedback at earlier stages of the semester from their students in order to improve their teaching quality.

Similarly the peers appreciated that the alumni survey of the IT programme will in future include questions relating to the reasons of unemployment which will allow for further analysis of the problem. The recommendations of the panel will consequently be held up until the next re-accreditation when results of the introduced changes may be checked.

## **D Additional Documents**

Before preparing their final assessment, the panel ask that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

1. Examination schedule from the last 4 semesters including mid-term and final exams
2. Academic calendar including teaching and examination weeks.
3. Module descriptions of the summer training

## **E Comment of the Higher Education Institution (03.01.2017)**

The institution provided an extensive statement as well as additional documents on various topics.

## F Summary: Peer recommendations

Taking into account the additional information and the comments given by the Eastern Mediterranean University the peers summarize their analysis and final assessment for the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
B.Sc. Information Technology	With or without requirements	Euro-Inf®	30.09.2023

### Requirements

- A 1. (ASIIN 3) Ensure that the graduation project includes aspects of academic research and analysis (literature survey/review and a citation index of utilized bibliography).
- A 2. (ASIIN 5.2) Ensure that the Diploma Supplement contains in addition to the final mark, statistical data according to the ECTS-User's guide to allow readers to categorize the individual result/degree.

### Recommendations

- E 1. (ASIIN 1.3, 2.3) It is recommended to familiarize the students with independent academic research and writing in an earlier stage of the curriculum.
- E 2. (ASIIN 3) It is recommended that individual grading of the graduation projects should be based, first and foremost, on the written documentation. Furthermore, it is recommended that students complete their final projects individually to foster the competence to work on a set research task independently.
- E 3. (ASIIN 4.1, 4.2) It is recommended to further support the teaching staff in their professional development and research activities.
- E 4. (ASIIN 4.1, 4.3) It is recommended to increase the number of technical and lab assistants.
- E 5. (ASIIN 6) It is highly recommended that students are systematically informed about the results of surveys in order to close feedback loops in this regard.

- E 6. (ASIIN 6) It is recommended to assess the reasons for the rather high unemployment rate of the graduates and if necessary, adequate measures should be implemented to ensure the responsiveness of the programme to the demand of the job market.

## **G Comment of the Technical Committee (15.03.2017)**

The technical Committee discussed the procedure and followed the assessment of the peers with only minor editorial changes concerning recommendation 3.

Assessment and analysis for the award of the Euro-Inf® Label:

The Technical Committee judges that the intended learning outcomes of the degree programme do comply with the informatic specific part of Subject-Specific Criteria of the Technical Committee 04 – Informatics.

The Technical Committee 04 – Informatics recommends the award of the seals subjected to the final assessment of the peers as follows:

<b>Degree Programme</b>	<b>ASIIN-seal</b>	<b>Subject-specific label</b>	<b>Maximum duration of accreditation</b>
B.Sc. Information Technology	With requirements for one year	Euro-Inf®	30.09.2023

## H Decision of the Accreditation Commission (31.03.2017)

### *Analysis of the award of the subject-specific label of ASIIN:*

Die Accreditation Committee discusses the procedure and concludes to follow the recommendations of the peers and the Technical Committee.

### *Analysis of the award of the Euro-Inf® Label:*

The Accreditation Committee is of the opinion that the envisaged learning outcomes of the degree programme adequately correspond with the Subject Specific Criteria of the Technical Committee 04 – Informatics.

The Accreditation Commission for Degree Programmes decides to award the following seals:

<b>Degree Programme</b>	<b>ASIIN-seal</b>	<b>Subject-specific label</b>	<b>Maximum duration of accreditation</b>
B.Sc. Information Technology	With requirements for one year	Euro-Inf®	30.09.2023

### **Requirements**

A 1. (ASIIN 3) Ensure that the graduation project includes aspects of academic research and analysis (literature survey/review and a citation index of utilized bibliography).

A 2. (ASIIN 5.2) Ensure that the Diploma Supplement contains in addition to the final mark, statistical data according to the ECTS-User's guide to allow readers to categorize the individual result/degree.

### **Recommendations**

E 1. (ASIIN 1.3, 2.3) It is recommended to familiarize the students with independent academic research and writing in an earlier stage of the curriculum.

E 2. (ASIIN 3) It is recommended that individual grading of the graduation projects should be based, first and foremost, on the written documentation. Furthermore, it is recommended that students complete their final projects individually to foster the competence to work on a set research task independently.

E 3. (ASIIN 4.1, 4.2) It is recommended to further enable the teaching staff to take sabbaticals thus furthering their professional development and research activities.

E 4. (ASIIN 4.1, 4.3) It is recommended to increase the number of technical and lab assistants.

E 5. (ASIIN 6) It is highly recommended that students are systematically informed about the results of surveys in order to close feedback loops in this regard.

E 6. (ASIIN 6) It is recommended to assess the reasons for the rather high unemployment rate of the graduates and if necessary, adequate measures should be implemented to ensure the responsiveness of the programme to the demand of the job market.



## Appendix: Programme Learning Outcomes and Curricula

According to programmes-specific website the following **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programme:

“Graduates:

- Apply problem solving skills, core IT concepts, efficient practices and standards to Information Technologies;
- Identify and evaluate organizational requirements with the current and emerging technologies;
- Select, design, integrate and administer IT-based solutions within an organizational environment;
- Use strong analytical and critical thinking skills as well as practical knowledge within the field of IT;
- Be equipped with the theoretical background to pursue graduate level (second cycle) studies;
- Communicate effectively, both in writing and in speaking;
- Demonstrate the ability to participate effectively in the planning and execution of team-based projects;
- Describe the impact of IT solutions in a global, societal, and ethical context;
- Describe the need for continuous learning;
- Follow the latest developments within the field of IT;
- Use practical skills which is compatible with the business requirements;
- Be broadly educated.”

The following curriculum is presented:

### FRESHMAN YEAR

<b>First Year Fall Semester (16/16 Credits, 28/28 ECTS)</b>								
Sem.	Ref Code	Course Code	Full Course Title	Course Category	Credit			Prerequisites
					(Le/La/T)	EMU	ECTS	
1	35711	ITEC103	Information Technology Fundamentals	AC	(2,2,0)	3	6	
1	35712	ITEC113	Algorithms and Programming Techniques	AC	(3,2,0)	4	8	
1	35713	ITEC161	Introduction to Business	AC	(3,0,0)	3	4	
1	35714	MATH133	Basic Mathematics	AC	(3,0,1)	3	6	
1	35715	ENGL191	Communication in English - I	UC	(3,0,1)	3	4	

<b>First Year Spring Semester (18/34 Credits, 31/59 ECTS)</b>								
Sem.	Ref Code	Course Code	Full Course Title	Course Category	Credit			Prerequisites
					(Le/La/T)	EMU	ECTS	
2	35721	ITEC114	Structured Programming	AC	(3,2,0)	4	8	ITEC113
2	35722	ITEC122	Introduction to Multimedia	AC	(3,1,0)	3	7	ITEC103
2	35723	MATH134	Discrete Mathematics for Information Technology	AC	(3,0,1)	3	6	MATH133
2	35724	ENGL192	Communication in English - II	UC	(3,0,1)	3	4	ENGL191
2	35725	TUSL181 HIST280	Turkish as a Foreign Language History of Turkish Reforms	UC	(2,0,0)	2	3	
2	35726	UE-01	University Elective - I	UE	(3,0,0)	3	3	

### SOPHOMORE YEAR

<b>Second Year Fall Semester (18/52 Credits, 30/89 ECTS)</b>								
Sem.	Ref Code	Course Code	Full Course Title	Course Category	Credit			Prerequisites
					(Le/La/T)	EMU	ECTS	
3	35731	ITEC212	Database Management Systems	AC	(3,2,0)	4	6	
3	35732	ITEC213	Data Structures and Applications	AC	(3,2,0)	4	6	ITEC114
3	35733	ITEC215	Human Computer Interaction	AC	(3,0,1)	3	6	
3	35734	ITEC229	Client-Side Internet and Web Programming	AC	(3,2,0)	4	6	
3	35735	ITEC255	Computer Organization and Architecture	AC	(3,0,1)	3	6	

<b>Second Year Spring Semester (20/72 Credits, 30/119 ECTS)</b>								
Sem.	Ref Code	Course Code	Full Course Title	Course Category	Credit			Prerequisites
					(Le/La/T)	EMU	ECTS	
4	35741	ITEC202	Operating Systems	AC	(3,2,0)	4	6	ITEC255
4	35742	ITEC224	Database Programming	AC	(3,2,0)	4	6	ITEC212
4	35743	ITEC230	Rich Internet Application (RIA) Development	AC	(3,2,0)	4	6	ITEC229
4	35744	ITEC243	Object Oriented Programming	AC	(3,2,0)	4	6	ITEC114
4	35745	ITEC259	Digital Logic Design	AC	(3,2,0)	4	6	

## JUNIOR YEAR

### Third Year Fall Semester (18/90 Credits, 30/149 ECTS)

Sem.	Ref Code	Course Code	Full Course Title	Course Category	Credit			Prerequisites
					(Le/La/T)	EMU	ECTS	
5	35751	ITEC309	Computer Networks - I	AC	(4,0,0)	4	7	
5	35752	ITEC315	System Analysis and Design	AC	(3,2,0)	4	8	
5	35753	ITEC327	Server-Side Internet and Web Programming	AC	(3,2,0)	4	6	ITEC230, ITEC212
5	35754	MATH211	Introduction to Statistics	AC	(3,0,1)	3	6	
5	35755	UE-02	University Elective - II	UE	(3,0,0)	3	3	

### Third Year Spring Semester (17/107 Credits, 30/179 ECTS)

Sem.	Ref Code	Course Code	Full Course Title	Course Category	Credit			Prerequisites
					(Le/La/T)	EMU	ECTS	
6	35761	ITEC310	Computer Networks - II	AC	(3,2,0)	4	7	ITEC309
6	35762	ITEC314	Multi-Platform Programming	AC	(3,2,0)	4	7	ITEC243
6	35763	ITEC316	Software Engineering	AC	(3,0,1)	3	7	ITEC315
6	35764	ITEC317	Ethical and Social Issues in Information Systems	AC	(3,0,0)	3	3	
6	35765	AE-01	Area Elective I	AE	(3,0,1)	3	6	

## SENIOR YEAR

### Fourth Year Fall Semester (17/124 Credits, 34/213 ECTS)

Sem.	Ref Code	Course Code	Full Course Title	Course Category	Credit			Prerequisites
					(Le/La/T)	EMU	ECTS	
7	35771	ITEC400	Summer Training	AC	(0,0,0)	0	1	
7	35772	ITEC403	Graduation Project Orientation	AC	(1,0,0)	1	3	
7	35773	ITEC413	Information System Security	AC	(3,2,0)	4	6	
7	35774	ITEC415	Analysis of Algorithms	AC	(3,0,1)	3	6	
7	35775	ITEC421	Management Information Systems	AC	(3,0,1)	3	6	
7	35776	AE-02	Area Elective - II	AE	(3,0,1)	3	6	
7	35777	AE-03	Area Elective - III	AE	(3,0,1)	3	6	

### Fourth Year Spring Semester (15/139 Credits, 27/240 ECTS)

Sem.	Ref Code	Course Code	Full Course Title	Course Category	Credit			Prerequisites
					(Le/La/T)	EMU	ECTS	
8	35781	ITEC404	Graduation Project	AC	(3,0,0)	3	6	ITEC403
8	35782	AE-04	Area Elective - IV	AE	(3,0,1)	3	6	
8	35783	AE-05	Area Elective - V	AE	(3,0,1)	3	6	
8	35784	AE-06	Area Elective - VI	AE	(3,0,1)	3	6	
8	35785	UE-03	University Elective - III	UE	(3,0,1)	3	3	

**AC = Area Core AE = Area Elective UC = University Core UE = University Elective**

**Le = Lecture Hours La = Lab Hours T = Tutorial Hours**