EPOKA UNIVERSITY | Department of Computer Engineering

# ANNUAL REPORT

2 November 2020 – 30 September 2021

# Annual Report

2 November 2020 – 30 September 2021

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# A. Organization & Management

## Introduction

Dr. Arban Uka
Head of Department

## GENERAL

Computer Engineering covers a wide range of engineering applications from hardware, software, networking, system administration, database managements systems, etc. Computer Engineering is distinguished as being one of fastest developing area and the most required in the job market. It is related to all sciences, being able to push them forward from their current status by providing automatic control, improved computational speed and better optimization.

## MISSION

The mission of the Department of Computer Engineering is to educate the students to gain an understanding of the fundamentals of science and engineering so that they can develop solutions to Computer Engineering problems and enhance their computing, engineering, and research skills. It is aimed to especially emphasize teamwork, independent and innovative thinking and leadership qualities. In particular, the Computer Engineering Program aims to:

- Train the students to have theoretical background in basic sciences and engineering and to be equipped with necessary technical skills,
- Provide practical experience which will enable students to utilize and enhance their engineering knowledge,
- Promote students' self-discipline and self-assurance and the ability to learn on their own,
- Encourage teamwork, collaboration and development of interpersonal skills,
- Motivate the students towards contributing to the progress of science and technology,
- Teach the importance of ethical behavior in social and professional life,

- Produce graduates for the engineering and the business communities who are observant, inquisitive and open to new technologies for developing better solutions,
- Produce graduates for the engineering and business communities with integrity, determination, judgment, motivation, ability and education to assume a leadership role to meet the demanding challenges of the society.
- Develop students' competency in reading, writing and oral communication,
- The vision of the Department of Computer Engineering is to be a department whose graduates are highly preferred in worldwide IT industry and to gain a leadership position in Albania and Balkans.

## Study programs offered by the Department

The Department of Computer Engineering offers undergraduate and postgraduate study programs in Computer Engineering, Electronics and Digital Communication Engineering and Software Engineering. The undergraduate programs are based on the three-year bachelor system and the students graduate with Bachelor's in Computer Engineering, Electronics and Digital Communication Engineering and Software Engineering. The postgraduate study programs include Master of Science, Professional Master and PhD in Computer Engineering and Master of Science in Electronics and Communication Engineering.

# B. Resources

## Department Staff

### Full time Academic Staff

#### Dr. Arban UKA

Arban Uka – holds the PhD degree in Physics from University of Texas, United States of America, Austin, 2009. He has been awarded from the Holland Research School of Molecular Sciences (HRSMC) fellow, Leiden University and University of Amsterdam, Summer 2015. Has offered courses: Electromagnetic Waves, Electromagnetic Field Theory, Numerical Analysis in the Bachelor level; Advanced Numerical Methods and Digital Image Processing in the graduate level. His current interests include i) image acquisition using portable microscopy techniques such as digital in line holography, phase contrast microscopy, and lens-free microscopy, ii) image analysis using both intensity information and machine learning approaches, iii) pattern recognition with a focus on biometrics, He uses deep learning algorithms for medical image classification, cell detection, cell counting and cell segmentation. His research interest is based on: Image acquisitions, Point of Care Microscopy, Image Analysis, Computational Imaging, Deep Learning Techniques for Image Analysis. Some of the projects that Dr. Uka has been part are Horizon 2020: PANBioRA- Personalized And/or Generalized Integrated Biomaterial Risk Assessment, EPOKA University, Project coordinator, 01/2018 – ongoing. COST Project: MULTI-modal Imaging of Forensic Science Evidence - tools for Forensic Science (MULTIFORSEE), EPOKA University, Project coordinator, 09/2017 – ongoing. COST Project: Biomaterials and Advanced Physical Techniques for Regenerative Cardiology (BIONECA), EPOKA University, Project coordinator, 09/2018 – ongoing. Currently, he holds the position of Head of the Computer Engineering Department and at the same time is full – time lecturer.

**Dr. Ali Osman Topal**

He has received his PhD in April 2017. Currently, he is the academic coordinator of Electronics and Digital Communication Engineering, Lecturer at Computer Engineering Department, and head of IT office at EPOKA University. His doctoral dissertation examines the evolutionary computations and nature inspired algorithms (meta-heuristics). In his research, he has developed a new meta-heuristic algorithm for global numerical optimization. It has been extensively evaluated on high-dimensional optimization problems and compared with well-known algorithms. The research results have been published in refereed journal publications and presented at conferences. His future research plans are aimed at using meta-heuristic and machine learning techniques on real world problems. Beyond his research successes (including thirteen papers to date and others in preparation) he has had the chance to obtain awide range of teaching experiences. Dr. Topal has a bachelor's degree in Electrical and Electronics Engineering, Master's and PhD's degree in Computer Engineering. Through his experience in two major programs, Dr. Topal has developed confidence and broad view that is useful on analyzing engineering problems with different perspectives.

**Dr. Julian HOXHA**

Julian Hoxha is lecturer of the department of Computer Engineering at EPOKA University. He has a B.Sc. degree in Electronic Engineering., Roma Tre University, Italy , Rome, 2010, M.Sc. degree in Information and Communication Technologies, Roma Tre University, Italy, Rome, 2012. He also holds a PhD degree in Photonics and digital signal processing for optical communications, Roma Tre University, Italy, Roma, 2016. Projects were Dr. Hoxha has been part are Rete Ottica di Accesso e Divisione di frequenza e/o di lunghezza d'onda per soluzioni Next Generati, Rome, Italy, Roma Tre University, Optical Frequency/Wavelength Division Multiple Access Techniques For Next Generation Networks. The ROAD-NGN project aims to investigate and experiment new technological solutions to facilitate the migration of wired access systems from copper to optical fiber, considering solutions that enable the unbundling of

the local loop and are upgradable toward very ultra-wideband systems, within the Horizon 2020., 01/2013 - 2016-0101 Adaptive Software defined Terabit tRansceiver for flexible Optical Networks (ASTRON), Rome, ASTRON project aims at the design and development of an integrated optical transceiver (Tx/Rx) that will enable the wide and cost-efficient deployment of flexible core and access networks., 09/2012 - 2016-04-01.

**Dr. Mirela ALHASANI**

Dr. Mirela Alhasani (Dubali) obtained her PhD degree in 2019 from University of Sofia 'St.Kliment Ohriski' in Classic and Modern Philology. Her dissertation was an interdisciplinary case study curriculum reform of foreign languages in compatibility with the professional linguistic needs of EU market as a future target of Albanian university graduates. Dr. Alhasani was theoretically equipped with such EU and IR scientific background at her Master program at the Central European University on a full scholarship of excellence by Open Society Institute to attend the Master Program in International Relations and European Studies during time period 2003-2004. As an undergraduate student of excellence at the Foreign Language Faculty in Elbasan, she participated and was trained in curriculum design, pedagogic training and higher education management by Civic Education Project in South-eastern Europe. During this international academic-oriented project, Dr. Alhasani was trained in theories and further course designing in EU and Humanties/ Language policy. Currently, she is involved in CLIL-HET Visegrad+ project 2018-2020; in Cost Action 18209 – European network for Web-centered linguistic data science 2019-2023; Cost Action 18231 – Multi3Generation: Multi-task, Multilingual, Multi-modal Language Generation 2019-2023. She is a member of the Editorial Board of The International Journal of TESOL Studies published by Faculty of Foreign Languages at Shanghai Jiao Tong University, China, member othe f Scientific Committee and Editorial Board of The International Conferences on Ethe SP at University of Nis Serbia and of the Journal of Teaching. Dr. Mirela Alhasani has been teaching for 14 years at several institutions such as Tirana State University, Durres University, Visiting Lecturer at University of Sofia, and currently she is full staff member of English for Academic and Specific Purposes at Faculty of Architecture and Engineering at EPOKA University.

**Assoc. Prof. Dr. Carlo CIULLA**

Carlo Ciulla's former academic appointments were science and technology agency fellow (STA) at the National Institute of Bioscience and Human Technology in Tsukuba – Japan (1995 - 1997), graduate student at RUTGERS and NJIT (1998 - 2002), research associate at Yale University (2002 - 2003), postdoctoral scholar at the University of Iowa (2004 – 2005), postdoctoral scholar at the Wayne State University (2005 - 2007) and assistant professor of computer science at Lane College (2007 - 2009). During the years 2009 to 2012, he had been a self-employed scholar who devoted his time to his research interests related to the development of innovative methods of signal interpolation and also to the development of educational software for students. In 2012, he joined the University of Information Science and Technology (UIST) St. Paul the Apostle, Ohrid, Republic of North Macedonia, as an assistant professor. In 2019, he joined Epoka University's Department of Computer Engineering as lecturer, associate professor.

**Dr. Igli HAKRAMA**

Igli Hakrama is a lecturer under the department of Computer Engineering for 10 years now. His teaching activity has been focused on courses of Programming, Web and Software Engineering, including here also the Data Mining and System Administration courses. His research focus is on Applied Artificial Intelligence in Information Systems, Data and Process Mining, agent-based software engineering, agent-based modeling and simulation in economy. Igli has already presented in many national and international conferences, and has published many papers in international journals, all of whom are within his research focus areas.

**Dr. Maaruf ALI**

Maaruf Ali is a lecturer of Computer Engineering department. He holds a PhD degree in Electronic Engineering from King's College London, University of London, United Kingdom, London, 1997. The courses that he has been delivering are: Electrical & Electronic Circuits,

Network Security, Wireless Networks, Term Project, Circuit Theory, Electronics I, Digital Communication I, Graduation Project, Digital Communication Systems, Operating Systems, Integrated Systems. His research of interest fields are: Internet of Things (IoTs); Computer User Interfaces; Mobile Communications; Location Based Services; Image Processing and Coding. Successfully co-supervised four PhD students to completion - one as Director of Studies. Examined: 20 PhD students, 16 as an external examiner, both nationally and internationally. Some of the projects that Dr. Maaruf has been part are Conference Chair iCETiC '21, London Metropolitan University, UK, 4th International Conference on Emerging Technologies in Computing 2021 (iCETiC ’21), 18th -19th August, 2021, at London Metropolitan University, UK. iCETiC ’21 Proceedings will be published in the Springer-Verlag LNICST Series, in cooperation with EAI. http://www.icetic21.theiaer.org/, 11/2020 – ongoing, Conference Chair iCCECE '21, University of Essex, UK, 4th IEEE International Conference on Computing, Electronics and Communications Engineering (IEEE iCCECE ’21) 2021, 16-17 August, 2021, University of Essex, Southend Campus, UK. http://www.iccece21.theiaer.org/index.html, 11/2020 – ongoing, Conference Chair iCCECE '18, University of Essex, UK, The First International Conference on Computing, Electronics and Communications Engineering (iCCECE ’18) 2018, was held from 16th – 17th August, 2018, on the beautiful grounds of the University of Essex, Southend, UK. iCCECE ’18 was technically co-sponsored by the IEEE UK and Ireland Section, IEEE Bahrain Section, IEEE ComSoc Bahrain Chapter and BCS (British Computer Society) Chester and North Wales Branch. iCCECE '18 papers have been published in IEEE XPlore., 08/2017 - 2018-08-17, Conference Chair iCCECE '20, University of Essex, UK, 3rd IEEE International Conference on Computing, Electronics and Communications Engineering (IEEE iCCECE ’20) 2020, 17-18 August, 2020, University of Essex, Southend Campus, UK., 09/2019 - 2020-08-18

**Dr. Shkëlqim HAJRULLA**

Shkëlqim Hajrulla is a lecturer of the Department of Computer Engineering since 2019. He has received his B.Sc degree in University of Tirana “Teacher of Math at High School Level`” and his M.Sc degree in Applied Mathematics at “University of Vlora” and his PhD in Water Wave Equation. Numerical Methods and Application- “University of Vlora”. The courses he is

teaching are: Numerical Analysis, Mathematics for Engineering, Calculus I, Differential Equations, Probability and Statistics, Basic Mathematics. His research experience is: Differential forms for water wave equations in Applied Sciences. Dr. Shkëlqim Hajrulla has been teaching from 2003.

**M.Sc. Hakan YOZGATLI**

Hakan Yozgatli has received a bachelor's and Master of Science degree in mathematics, Bosporus University, Istanbul Turkey. He is a full-time lecturer in the Department of Computer Engineering at EPOKA University. M. Sc. Yozgatli has been teaching at several institutions such as Turgut Ozal, Mehmet Akif Girls Collage, Mehmet Akif Boys Collage. In our department he teaches Calculus I, Calculus II.

**M.Sc. Florenc SKUKA**

Florenc Skuka received a B.A and M.Sc. degree in computer engineering from Polytechnic University of Tirana and Epoka University respectively. Now he is a Ph.D. Student at Erciyes University, Turkey. He is an Assistant Lecturer in the Department of Computer Engineering at Epoka University since 2016. And has been a member of the research faculty since 2012. He has published articles and presented papers in International Conference on Information Technology in Jordan. His research interests lie in the area of point cloud data processing, computer vision, image fusion. He has collaborated actively with researchers in several other disciplines of computer science.

**M.Sc. Enea MANÇELLARI**

Enea Mançellari – is a full-time lecturer in the Department of Computer Engineering at EPOKA University where he has been since 2017. He has received his B.Sc. degree in Computer Engineering from EPOKA University, Tirane, and his M.Sc. degree in Computer Engineering from EPOKA University, Tirane. He is a Phd Student at Istanbul Technical University, Istanbul/Turkey. His research experience and interests are mainly in the areas of: Data Compression, Fuzzy Logic, Data Mining and Cryptography.

**M. Sc Xhoena POLISI**

Xhoena Polisi is an experienced teaching and project assistant with a demonstrated history of working in the higher education industry. Affiliated as assistant lecturer at the Computer Engineering department in EPOKA University, and as a project assistant for the PANBIORA project, funded by EU Horizon 2020 Grant, she loves teaching and research. Before this, she has been a TA at the same department and has been on the helping organizing board of different activities such as Programming Camp & Program both supported by Google, teaching fundamental basis of computers to orphan children, ACM- creation of a new online programming competition website etc. She is a strong research professional with a Master of Science focused on medical image processing and analysis through traditional and innovative AI based methods. Her master thesis entitled "Cell detections algorithms in different cell environments" was awarded as Best Thesis of the year in ICT AWARDS VII edition. She is also part of the research group NanoAlb, which focuses on current trends and research related to nanotechnology. and nanoscience. Her passion about research and algorithms is shown with different publications on related fields and she is currently pursuing a PhD degree at the same university.

**M.Sc. Hashmet DURMISHI**

Hashmet Durmish full time assistant lecturer in the Department of Computer Engineering since September 2020. He has finished his B.Sc. and M. Sc. Degrees in Tirana University, Natural Science Faculty 1991-1995. M.Sc. Durmishi has been teaching at several institutions such as: Physics teacher to grades 9-12 and Mathematics teacher to grades 12 between 1995-1998. Interpreter of English-Albanian and Albanian-English at “Children’ Aid Direct” Foundation between April 1999 and November 1999. Interpreter to a “Solicitor Company” dealing with Political Asylum and Civil Issues in the town of Northampton, United Kingdom from 2000 till 2004. Physics teacher for “Turgut Ozal” Tirana and Durrësi Colleges and “Mehmet Akif”Boys

and Girls Colleges teaching grades 9, 10, 11 and 12 from 2005 until August 2020. Assistant lecturer teaching Physics course at Epoka University from September 01 2020 and ongoing.

**M. Sc. Sabrina BEGAJ**

Sabrina Begaj - Full time Assistant Lecturer in the Department of Computer Engineering. She holds a Master of Science degree in Computer Engineering from EPOKA University. Sabrina has been involved in education activities since 2017 and starting from 2020 she has been working as Assistant Lecturer in EPOKA University. Her research is focused on Deep Learning and Image Processing.

**M. Sc. Jola KOÇI**

Jola Koçi- Full time assistant lecturer in the Department of Computer Engineering. She has received her B.Sc. degree in Computer Engineering from EPOKA University, Tirane, and her M.Sc. degree in Computer Engineering from EPOKA University, Tirane. In our department she teaches the following courses: C and C++ Programming, Data Structure, Computer Networks, Object Oriented Programming.

**Part time Academic Staff**

**Prof. Dr. Betim ÇIÇO**

Prof. Betim Çiço has been graduated as a distinguish student from Polytechnic University of Tirana in Electronic Engineering and 1983 he gained PhD degree in Nuclear Physics. In 1999 he has been awarded with the title of full professor. He has been working in several institutions as below mentioned: 1971-1972, Engineer in Shijak Broadcasting. From 1972 -1998, Scientific Researcher in the Institute of Nuclear Physics in the field of nuclear electronics. 1972 - 1998 part time professor in PUT. From November 1998 -2012, full time Professor in Electronic Department at PUT, 10 years Head of Computer Engineering Section (1998 -2008) and 4 years Head of Computer Department (2008 2012). 2012- 2014 - Dean of the CST Faculty in SEEU,

Tetovo, Macedonia. 2014- 2016 October full time Professor in Aleksander Xhuvani University, Elbasan, Albania. From October 2016 professor in EPOKA University (2009 - September, 2016 part-time professor in EPOKA University). During this period, Prof.Dr. ÇIÇO teaches different courses in bachelor, master and PhD study related to Electronic Systems, Digital Design, Computer Architecture, Advance Computer Architecture, Research Methodology, and Artificial Intelligence in PUT and as an invited professor in many Universities in Albania, Kosovo (Prishtina University) and Macedonia (SEEU University, Tetovo). Participation in many trainings, workshops, and scientific visits in China, Germany, France, United Kingdom, Turkey, Italy, Greece, etc. Member of more than 55 different Programmes Committee in Scientific Conferences. Supervisor of 20 PhD students. From 2007 - 121 papers in Proceedings of Conferences (IEEE, ACM, Springer Verlag, etc) and 44 papers in Scientific Journals. Member of Project Group, MoES, for the implementation of the Education Management Information System (EMIS) Component under the Transition Education Reform Project in Albania 1999 – 2001. National consultant of the World Bank in this Education Reform Project in Albania, financed by the World Bank;

**Dr. Isa ERBAS**

Dr. Erbas has had different academic and administrative positions at Beder University since 2014 such as: Lecturer, Head of English Department, Vice Rector, Vice Dean, International Relations Office Coordinator, Head of Internal Self Evaluation Report for the Institutional Accreditation, Vice chair of Quality Assurance Council, Member of editorial board at Beder Journal of Educational Sciences, Member of editorial board at International Conference on Language and Literature, Member of executive committee at International Conference on Language and Literature, Chairman of International Conference on Language and Literature. He has finished his bachelor and master's degree in the programme of English language and Teaching at Penza State Pedagogical University, Penza, Russia. In addition to his master's degree in the English Language and Teaching, he has finished another master's degree in political science and International Relations at EPOKA University. He has received his PhD degree in Political Science and International Relations at the Tirana European University. He has

taken training from the Oxford University Department for Continuing Education and Oxford University Press about the ELT Management and Teaching English to Teenagers. During his academic career he has published tens of articles, participated in many national and international conferences and supervised tens of theses of master students. Dr. Isa Erbas has taught the following bachelor and master courses: Communication Skills, British History and Culture, American History and Culture, International Relations and Legal Settlements of Disputes, American Culture and Literature, Post - Graduating Seminar, Research Methods, Psycholinguistics, Theories of Teaching and Learning, Stylistics, Academic writing, Technology Use and Preparation of Didactic Materials, The Development of British Novelette.

**Dr. Klaudio PEQINI**

Klaudio Peqini is a part – time lecturer in the Department of Computer Engineering. He has finished his B.Sc. and M.Sc. degree in the Department of Physics, Faculty of Natural Sciences, University of Tirana, Tirana, Albania. He hold a PhD degree in in the Department of Physics, Faculty of Natural Sciences, University of Tirana (Albania): "Modeling of the variations of the geomagnetic field" (May 2018), evaluated 97/100. He teaches different courses such as: Basics to Statistical Physics, Analytical Mechanics, Computational Physics, General Physics I (Mechanics, Tirana and EPOKA University), General Physics III (Electromagnetism, Tirana and EPOKA University), and Lecturer in Fluid dynamics. He gained fourth place in the National Physics Olympiad held on March 2008 in the Faculty of Natural Sciences. Dr. Peqini has been part of some scientific projects: 2012-2014 Participant in the project: "Study of the stability of fluid dynamic systems in cylindrical and spherical geometry", project included in the Executive Program of Scientific and Technological Cooperation between Albania and Italy, for the years 2012 – 2014. 2013-2015 Participant in the project: "Numerical experiments on the natural convection of the fluids between coaxial cylinders and concentric spheres (NUM-EXP-NAT-CONV)", a winning project of "hp-see-pilot-call-awarded- applications" (High Performance Computing in South East Europe). 2015-2017 Participant in the project: "Using ground and satellite data to study the variations of the geomagnetic field over Austria and Albania". This Project is in collaboration between University of Tirana and ZAMG (Zentrale Anstalt für Geophysik und Geodynamik), Vienna, Austria.

**Assoc. Prof. Dr. Albana HALILI**

Assoc. Prof. Dr. Halili is a part-time lecturer of EPOKA University. He has a B.Sc in Chemical Engineering Departmentin – Ankara, Turkey, M.Sc. and PhD degree in Biotechnology, Middle East Technical University -Ankara, Turkey. In 2021 she has been awarded with the title of Associate Professor. She has been working in different institutions, we can mention; 40 days summer practice in Dye and Textile Factory, Istanbul, Turkey, 40 days summer practice in FAKO Pharmaceutical Factory, Istanbul, Turkey, 40 days summer practice in FAKO Pharmaceutical Factory, Istanbul, Turkey, Participance on 'Biophysical and biochemical analysis of collagen' workshop held in Lubeck, Germany (a part of Expert issues project), PhD thesis accepted as a SANTEZ project to be funded for 2 years by Turkish Ministry of Industry and Business (Sanayi ve Ticaret Bakanligi). She owns 2 Silver medals from the International Mathematics Project Competition held in Turkey in 1997 and 2 Silver medals from the International Mathematics Project Competition held in Turkey in 1997.

**Dr. Erind BEDALLI**

Dr. Erind Bedalli has received his B.Sc. degree in Computer Engineering from Hacettepe University, Ankara, and his M.Sc. degree in Informatics from University of Tirana. He completed his doctoral studies in the field of fuzzy logic and exploratory data analysis at University of Tirana in 2014. His research experience and interests are mainly in the areas of: Fuzzy Logic, Data Mining, Mathematical Modelling, Artificial Intelligence, Expert Systems and Large-Scale Computing.

**Dr. Eljona ZANAJ**

Eljona Zanaj is a part-time lecturer under the Department of Computer Engineering for the last 2 years. Her teaching activity has been focused on Electronic Systems, Electric &amp, electronic circuits and Control Systems. Her research focus is mostly based on Electronic Systems, Computer Networks, Sensors, Telecommunications Systems and Networks, especially Internet of Things Technologies, and the different methods used in Energy Efficiency for the sensors and the network in total. In regard to this, she has completed her PhD in the 31-st of July 2021 with the focus on energy efficiency for IoT networks.

**Administrative Staff**

**Ms. Fjona Topçiu**

Fjona Topçiu is the Coordinator of Department. She has finished her bachelor's in Business Informatics and master studies in Business Administration study program and since August 2020 works as Department Coordinator at EPOKA University.
She exercises her duties in coordination with the Faculty Administrator and Head of Department. The Coordinator of the Department is responsible for management of the department activities with administrative character and incoming and outgoing correspondences.

**Mr. Gent Imeraj**

Gent Imeraj is a a graduated student currently working in Epoka University, in the department of Computer engineering in the position of Laboratory Specialist. He has started working there in October 2019. Mr. Imeraj holds a bachelor degree in Epoka University in the department of Computer Engineering for Electronic and Digital Communication engineering study program. He has followed the bachelor studies during the period 2016-2019.

## Finance

-Income and various financing for **BA in Computer Engeeniernig** Study Program during the 2020-2021 academic year:

| Income (in Euro) | *2020-2021* |
|---|---|
| Tution fees for and during studies | 766,405 |
| *TOTAL* | **766,405** |

-Expenditures for **BA in Computer Engeeniernig** Study Program during the 2021-2022 academic year:

| | *2020-2021* | | |
|---|---|---|---|
| Expenditures (in EURO) | Salaries | Expenditures | Investments |
| Tuition and other student fees | 203,207 | 54,785 | 30,028 |
| **Total** | **203,207** | **54,785** | **30,028** |

-Income and various financing for **BA in Electronics and Communication Engeeniernig** Study Program during the 2020-2021 academic year:

| Income (in Euro) | *2020-2021* |
|---|---|
| Tution fees for and during studies | 258,762.5 |
| *TOTAL* | **258,762.5** |

-Expenditures for **BA in Electronics and Communication Engeeniernig** Study Program during the 2020-2021 academic year:

| | *2020-2021* | | |
|---|---|---|---|
| Expenditures (in EURO) | Salaries | Expenditures | Investments |
| Tuition and other student fees | 67,015 | 18,067 | 9,903 |
| **Total** | **67,015** | **18,067** | **9,903** |

-Income and various financing for **BA in Software Engeeniernig** Study Program during the 2020-2021 academic year:

| Income (in Euro) | *2020-2021* |
|---|---|
| Tution fees for and during studies | 125,050 |
| *TOTAL* | **125,050** |

-Expenditures for **BA in Software Engeeniernig** Study Program during the 2021-2022 academic year:

| | *2020-2021* | | |
|---|---|---|---|
| Expenditures (in EURO) | Salaries | Expenditures | Investments |
| Tuition and other student fees | 52,963 | 14,279 | 7,826 |
| **Total** | **52,963** | **14,279** | **7,826** |

-Income and various financing for **Msc in Computer Engeeniernig** Study Program during the 2020-2021 academic year:

| Income (in Euro) | *2020-2021* |
|---|---|
| Tution fees for and during studies | 67,807.81 |
| *TOTAL* | **67,807.81** |

-Expenditures for **Msc in Computer Engeeniernig** Study Program during the 2020-2021 academic year:

| | *2020-2021* | | |
|---|---|---|---|
| Expenditures (in EURO) | Salaries | Expenditures | Investments |
| Tuition and other student fees | 19,456 | 5,245 | 2,875 |
| **Total** | **19,456** | **5,245** | **2,875** |

Income and various financing for **PM in Computer Engeeniernig** Study Program during the 2020-2021 academic year:

| Income (in Euro) | *2020-2021* |
|---|---|
| Tution fees for and during studies | 13,095 |
| *TOTAL* | **13,095** |

-Expenditures for **PM in Computer Engeeniernig** Study Program during the 2020-2021 academic year:

| | *2020-2021* | | |
|---|---|---|---|
| Expenditures (in EURO) | Salaries | Expenditures | Investments |
| Tuition and other student fees | 1,081 | 291 | 160 |
| **Total** | **1,081** | **291** | **160** |

-Income and various financing for **Msc in Electronics and Communication Engeeniernig** Study Program during the 2020-2021 academic year:

| Income (in Euro) | *2020-2021* |
|---|---|
| Tution fees for and during studies | 55,840 |
| *TOTAL* | **55,840** |

-Expenditures for **Msc in Electronics and Communication Engeeniernig** Study Program during the 2020-2021 academic year:

| | *2020-2021* | | |
|---|---|---|---|
| Expenditures (in EURO) | Salaries | Expenditures | Investments |
| Tuition and other student fees | 11,890 | 3,206 | 1,757 |
| **Total** | **11,890** | **3,206** | **1,757** |

# IT Resources, Physical Infrastructure and Library Resources

## ICTC Office Services:


The Information and Communication Technologies Coordinating Office (ICTCO) provides informatics services needed in the University. It plans the informatics infrastructure of the University, provides its security and ensures the continuation of its functions. ICTCO works on the project for effective, legal and extensive usage of the informatics services for students and personnel.

**The Information and Communication Technologies Coordinating Office (ICTCO)** provides:

**Teaching Services:**

- **Turnitin** software helps you to understand and avoid plagiarism and develop your understanding of how to cite sources as part of an academic argument. ICTC office manages the users and train the staff about how to use turnitin.
- **Learning Management System (LMS)** – A service based on Moodle offered for students and instructors in order to access, coordinate and organize course materials online. Students and instructor can login on LMS using the provided official email account.
- **Library Automation System (Koha) -** Koha is an open-source Integrated Library System in use today by hundreds of libraries worldwide. Koha is web based, so there is no software to install on desktop computers. Users can check the books online and reserve them via web. Its features are more than enough to manage the Epoka Library effectively and efficiently.
- **DSpace** – The institutional repository of Epoka University: DSpace is an open source repository software package typically used for creating open access repositories for scholarly and/or published digital content. The proceedings of the conferences which are organized by Epoka University can be accessed from this repository. Epoka University is the only university who has digital repository in Albania (http://repositories.webometrics.info/en/Europe/Albania). We also provide services to other international journals to publish their publications (http://dspace.epoka.edu.al/handle/1/1378) in our digital repository.

**Google Services:**

- **Webmail (Google account) –** Epoka University is using Google Apps for Education services and all students and academic and administrative staff are provided with an email address under epoka.edu.al domain which is a Google account. Beside official communication which is done through this email address, this account can be used for authentication to other online systems offered by university.

- **Google Classroom** – A more interactive service offered by Google as part of Google Apps for education in order to access, coordinate and organize course materials on cloud. By using Google Classroom, course materials can be integrated with other Google services where assigned users can collaborate. Students and instructors can access this service using the provided account.

**Education Information System (Curriculum)** – a website containing information related to study programs, curriculum and course syllabus.

**Smart Card:** All students and staff are provided with Smart Card identification cards. The Smart Card is put as an e-ID application at three buildings, two PC labs, one Electronics Lab, and campus gate entry turnstiles and barriers. The e-wallet application is active for staff but has not started yet for students.

**Help Desk:** ICTCO is also responsible for the maintenance of personnel and PC Lab computers in respect to software and hardware. Its staff monitors the personal computers within the frame of distribution of duty and authority and brings the issues to a conclusion. At the same time, ICTCO plans servers and cabling services of the University. Staff can open ticket via help.epoka.edu.al for their ICTCO related problems and follow the process from here. You can share your opinions on every subject related to information technologies and informatics with help@epoka.edu.al and you can also write your complaints and suggestions for a better campus life.

**Software Opportunities**

Epoka University has a subscription of Microsoft Program which is called DreamSpark. It supports technical education by providing access to Microsoft software for learning, teaching and research purposes. Epoka family members can download software through www.dramspark.com website at no cost. Epoka University also provides Office 365 accounts to all staffs and students which includes all office applications for free.

**Network**

**Wireless:** Epoka University provides wireless internet connection to all Epoka members in the campus. As ICTCO, we ensure that the wireless signal is strong and covers everywhere in campus. **Wired:** Besides wireless, there are three PC labs, one Civil Engineering lab, one Electronics lab, one PhD study room, and library where PCs serve students and staffs with wired internet. In the Epoka Library and one of the classroom, there are plug and use stations next to each table where students and staff can use for wired internet and electricity for their laptops.

**Digital Signage:** There are four TVs in the campus, they are used to inform Epoka members about latest news and announcements.

**Epoka Interactive Systems (EIS)**


Recognizing the needs of campus community, Epoka has made a strategic decision to replace its aging, cumbersome, and vendor-supported student, instructors, and staff systems with a modern, nimble and effective internally built system that includes admissions, enrollment, registration, financial aid, student, instructor, and staff accounts, and advising in one platform.

EIS is developed by ICTCO at Epoka University. From the user interface, EIS is an online interactive system where users can log in using the provided official email account. It is a modular system organized by roles and respective units at the university and the information is

stored in a centralized database. All users have access to their personal information, can update general details and CV and they can manage job related tasks and activities according to their role and job position.

- **Students:** Students in their profile can access their personal information and information related to their study program. Course registration is done through the system and after that, students can view the ongoing academic activity of the registered courses during the semester. They can check attendance, exam dates, interim grades and final grades. Also in the system, they can access the program curriculum, transcript, grade calculation, weekly schedule, requests and notifications. The EIS prompts students when they are in the "warning zone" for financial or academic issues. It empowers students to create course plans to ensure timely graduation.

- **Instructors:** Academic staff including full-time and part-time lecturers, can have access to their courses assigned in the current semester and can also view previously assigned courses. Lecturers can update the syllabus, complete student attendance, assign and finalize grades. Advisor lecturers can have access to academic information of the students assigned for advisory and they can approve student course registration.

- **Coordinators:** The opening of courses according to course appointment in each semester is done by department coordinators and approved by faculty coordinators. Coordinators can monitor the academic activity of the lecturers under respective department.

- **Admissions and Registrar's Office:** Admissions Office enters all pre-registered student information and assigns scholarships. After the student has completed the registration, all the related information entered by Admissions office, is managed by Registrar's office.

- **Finance:** Finance office can manage and follow up all student financial information related to tuition fees and scholarship.

- **Human Resources:** Human resources office can manage all staff information data and assigns roles and job position for each staff.

- **Curriculum:** a website containing information related to study programs, curriculum and course syllabus.

All users have access to their personalized reports according to their roles and respective units. Faculties and units are liberated from tedious manual tasks. EIS supplies them with new and most updated information that will empower them to make informed decisions based on data.
EIS can be continuously updated with new modules according to the university needs. EIS can be accessed via: https:// eis.epoka.edu.al and users can log-in by their Epoka Mail account credentials.

**Measurable indicators:**

| | |
|---|---|
| number of PC for students | 120 |
| number of PC furnished labs per students | 4 |
| number of PC for academic staff | 87 |
| number of PC for administration | 53 |
| number of printers for each one | 15 |
| number of photocopying machines for each one | 15 |
| number of head projectors | 1 |
| number of video-projectors | 27 |
| number of scanners | 10 |

## PHYSICAL INFRASTRUCTURE

EPOKA University is located on the Tirana-Rinas road, on the 12th kilometer. The campus extends over a total area of 67,000 m2. The 2019-2020 academic year is being conducted regularly in the premises of two buildings with a total area of 14352 m2.

The E-building has a modern infrastructure and a central heating and cooling system. The classrooms are equipped with video projectors and smart boards that enable the normal conduct of the learning process.

On September 2013, the construction of A-Buiding the "Cultural Social Object of Epoka University" was completed. In addition to classes, there are plenty of recreational facilities for students such as cafeterias, libraries, Wi-Fi, facilities for the Student Council and student clubs, sports facilities, etc. Below are shown current picture of the building.

**Measurable indicators:**

☑ Premises of the Faculty

| **Premises for the Faculties** | **Quantity** | **Surface** | **$m^2$/student** |
|---|---|---|---|
| Auditoria/Classrooms for lectures | 5 | 752 | 0.40 |
| Classrooms for seminars | 17 | 1545 | 0.82 |
| Premises for promotion activities | 1 | 128 | 0.07 |
| Classrooms for course/professional practice | 2 | 258 | 0.14 |
| Laboratories for courses | 3 | 233 | 0.12 |
| Informatics laboratories | 2 | 174.6 | 0.12 |
| Internet Room | 2 | 151.8 | 0.12 |
| Library Hall | 1 | 322 | 0.17 |
| Premises for photocopying, bookshop etc. | 1 | 85.2 | 0.05 |
| Student information office | 2 | 71 | 0.04 |
| Corridors/halls | 25 | 2707.4 | 1.44 |
| Sports premises | 5 | 463 | 0.25 |
| Premises for service to third parties | 1 | 56 | 0.03 |
| Restrooms (WC) for students | 54 | 327.2 | 0.17 |
| Restrooms (WC) for academic personnel | 35 | 212.1 | 2.16 |

| **Premises for personnel:** | **Quantity** | **Surface** | **$m^2$/person ratio** |
|---|---|---|---|
| Offices for the Dean/Vice-Dean | 5 | 285.5 | 40.79 |
| Office for the Administrator | 1 | 25.4 | 25.40 |
| Offices for the Department Coordinators | 2 | 60.6 | 20.20 |
| Offices for departments/research centers | 12 | 328.5 | 27.38 |
| Offices for the academic personnel | 40 | 620 | 6.33 |
| Office for the Finance Office | 2 | 37 | 18.50 |
| Office for the Internal Quality Assurance Unit | 1 | 50 | 50.00 |
| Meeting rooms | 2 | 75 | 0.77 |
| Premises for service personnel | 11 | | 30.33 |
| Premises for the activities of the Student Council | 1 | 30 | 1.30 |
| Recreation premises such as cafeteria/fastfood/ restaurant | 1 | 337 | 0.17 |
| **Total** | 234 | 9335.3 | |

During the 2020-2021 academic year, the EPOKA University Campus uses for the 17 classes: (E010, E-011, E-211, E-212, E-213, E-311, E-312 (E-012, E-110, E-214, E-314 and A-005), E-313, A 117, A118, A119, A120, A127, A128, A129, A130, A131) a conference room (E-B01), three computer laboratories (E-011, E-015, A-126), an electronic lab (E-010) and a civil engineering laboratory. There are 3 internet rooms as it is reflected in the table above, but the University offers wireless internet all over its space. The capacities used are given in the table below.

Classes used during the 2020-2021 academic year.

| **No.** | **Name of the Class** | **Surface (m2)** | **Capacity** |
|---|---|---|---|
| 1 | E B10 | 75 | 56 |
| 2 | E B11 | 104 | 60 |
| 3 | E 211 | 64 | 36 |
| 4 | E 212 | 81.32 | 72 |
| 5 | E 213 | 81.72 | 72 |

| | | | |
|---|---|---|---|
| 6 | E 311 | 63.46 | 40 |
| 7 | E 312 | 81.32 | 48 |
| 8 | E 313 | 81.72 | 40 |
| 9 | A 117 | 138.0 | 35 |
| 10 | A 118 | 138.0 | 35 |
| 11 | A 119 | 138.0 | 35 |
| 12 | A 120 | 138.0 | 35 |
| 13 | A 127 | 72.41 | 56 |
| 14 | A 128 | 73.53 | 56 |
| 15 | A 129 | 73.71 | 56 |
| 16 | A 130 | 72.02 | 56 |
| 17 | A 131 | 72.02 | 56 |
| **total** | **17** | **1548.23** | **836** |

Auditoriums used during the 2020-2021 academic year

| **No.** | **Name of Auditorium** | **Surface ($m^2$)** | **Capacity** |
|---|---|---|---|
| 1 | E 012 | 131.54 | 66 |
| 2 | E 110 | 130.82 | 136 |
| 3 | E 214 | 154.32 | 150 |
| 4 | E 314 | 154.32 | 134 |
| 5 | A 005 | 145.2 | 65 |
| **total** | **5** | **716.2** | **551** |

Laboratories used during the 2021-2022 academic year

| **Name** | **Laboratories** | **Surface (m2)** | **Capacity** |
|---|---|---|---|
| E 011 | Computer Laboratory 2 | 96.64 | 42 |
| E 015 | Computer Laboratory 1 | 77.93 | 40 |
| E B30 | Computer Laboratory 3 | 123.7 | 47 |
| A 126 | Computer Laboratory 4 | 72.4 | 42 |
| E 010 | Electronic Laboratory | 132 | 50 |
| E 012 | Projects Laboratory | 131.54 | 30 |

| | | | |
|---|---|---|---|
| A-120/1 | Architecture Laboratory | 27.6 | 12 |
| I 001 | Civil Engineering Laboratory | 283 | 40 |
| **Total** | **8** | **944.8** | **323** |

**Civil Engineering Laboratory** is used for study of various materials, especially concrete and the study of the earthquakes and its elements.

Civil Engineering Laboratory has an area of 283 $m^2$ and contains:

- The ground mechanics laboratory 29 m2
- Mechanical laboratory 83 $m^2$
- Laboratory of Noisy experiment 30 $m^2$
- Cutting with carrot 5 $m^2$
- Granularity analysis of 5 $m^2$
- Cement and concrete laboratory 45 $m^2$

EPOKA University has a conference hall with a surface of 128 $m^2$ and a capacity of 99 persons. The conference hall is used more for social, cultural and various national and international conferences. The hall is equipped with central heating-cooling system, video projector, sound system and two cabins for simultaneous translation. Also in the premises of the "Cultural Social Object" building is a conference hall with a surface of about 400 $m^2$ and a capacity of 300 persons.

**LIBRARY**

The EPOKA University Library, which is located on the first floor of A-Building in the Rinas Campus, was founded to support the education and research activities of the university by providing and organizing the needed documents.

With its 100-seating capacity, our library has 400 square meters area of use. Our University Library is composed of entrance, book and reading hall. In the entrance, there is a check out desk. The periodicals, including the exhibition of new arrivals, are also shelved in this section. The reading hall is equipped for students to study and to do research.

EPOKA University is a member of Balkan Libraries Union which was founded on 29 July 2009 with the participation of 10 institutions from 6 Balkan countries.

Our library collection is enriched by purchases and donations. The books to buy are chosen in accordance with the needs and requests of the students, administrative and academic staff. Under the Department of Library and Documentation, the library has a total of about 7500 printed books.

**Digital Databases**

EPOKA University has full membership in JSTOR, a shared digital library created in 1995 that includes more than 2,000 academic journals.

JSTOR was founded to help libraries and academic publishers transition their activities from print to digital operations, to expand access to scholarly content around the world and to preserve it for future generations.

Every member of EPOKA staff can access to JSTOR's collections by going to http://www.jstor.org/ and searching or browsing for content.

**Using the Library**

Our library works on the open shelf system enabling you to reach the books directly. The books in the open shelves are topically sorted in the book hall according to LC classification method. To find the book you are looking for, you should follow these steps:

1. Through the catalog search computers in the library; you can search author name, book name, and publisher, topic, or keyword areas.

2. To get the book, you can go to the shelves with the classification and location numbers of the books appearing on the screen as a result of your search.

**Example of LC number** for the book: "Exchange rates and international finance", Laurence S. Copeland / Financial Times, 2008 **HG 3821.C78 2008**

The first part of the LC number "**HG**" represents the category of the book by its topic. In the LC system, the first letter **H** stands for **Social Science** class. Each subsequent letter indicates next level of sub categories of the main topic. In the given example **G** stands for **Finance**, **3821** indicates sub categories included between 3810-4000 (Foreign exchange, International finance,

International monetary system), C78 indicates the first letter of authors surname, **2008** indicates book publication year.

**Regulations**

Students of Associate Degree, Bachelor's Degree and Master Students and academic and administrative personnel are the members of the library. They can borrow library materials in accordance with the rules.

Researchers coming from outside the university are not lent books, they are only allowed to use and copy the materials in the library. Readers in this group are requested to fill up the related form Lending Service.

**Circulation Rules**

| **Resource** | **Patron** | **Loan period(days)** | **Maximum number of check-outs(items)** |
|---|---|---|---|
| **Book** | Pre-undergraduate/Undergraduate students | 15 | 3 |
| | Graduate students | 15 | 5 |
| | Staff | 20 | 5 |
| **Bound Journal** | Graduate students Staff | 5 | 2 |
| **Visual/Audio Resources** | Pre-undergraduate/Undergraduate students Graduate students Staff | 3 | 3 |

# C. The Curriculum

## Undergraduate Teaching

### FACULTY OF ARCHITECTURE AND ENGINEERING
### DEPARTMENT OF COMPUTER ENGINEERING
### 3 (THREE) YEARS BACHELOR DIPLOMA IN COMPUTER ENGINEERING

**First Year**

**First Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Lecture and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 105 | Linear Algebra | A | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 5 |
| CEN 109 | Introduction to Algorithms & Programming | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| MTH 101 | Calculus I | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| PHY 101 | General Physics I | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| ENG 103 | Development of R. & W. Skills In English I | D | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 15 | 4 | 2 | 21 | 18 | 240 | 64 | 32 | 414 | 0 | 750 | 30 |

**First Year**

**Second Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| MTH 106 | Discrete Mathematics | A | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 5 |
| CEN 110 | C Programming | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| MTH 102 | Calculus II | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| PHY 104 | General Physics II | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENG 104 | Development of R. & W. Skills In English II | D | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 15 | 4 | 2 | 21 | 18 | 240 | 64 | 32 | 414 | 0 | 750 | 30 |

**Second Year**

**Third Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 215 | Object Oriented Programming | B | Compulsory | 3 | 0 | 2 | 3 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| CEN 217 | Electrical & Electronic Circuits | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| CEN 219 | Computer Organization | B | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| MTH 207 | Fundamentals of Probability | B | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| | Non Technical Elective | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 13 | 4 | 4 | 21 | 17 | 208 | 64 | 64 | 414 | 0 | 750 | 30 |

**Non technical electives**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| BUS 103 | Introduction to Business | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 201 | Turkish I | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 203 | German I | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 205 | Italian I | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 207 | French I | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |

**Second Year**

**Fourth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 202 | Database Management Systems | B | Compulsory | 2 | 1 | 1 | 4 | 3 | 32 | 16 | 16 | 86 | 0 | 175 | 6 |
| CEN 204 | Digital Design | B | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| CEN 206 | Data Structures | B | Compulsory | 2 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 150 | 7 |
| MTH 206 | Numerical Analysis | B | Compulsory | 4 | 0 | 0 | 4 | 4 | 64 | 0 | 0 | 86 | 0 | 150 | 6 |
| | Non Technical Elective | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 15 | 3 | 3 | 21 | 18 | 240 | 48 | 48 | 414 | 0 | 750 | 30 |

**Non technical electives**

| COURSES | | Course Type | Compulsory /Elective | Weekly Distribution | Course | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| BUS 103 | Introduction to Business | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 202 | Turkish II | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 204 | German II | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 206 | Italian II | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 208 | French II | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |

**Third Year**

**Fifth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 307 | Computer | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 70 | 0 | 150 | 6 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Networks | | | | | | | | | | | | | | |
| CEN 351 | Professional Practice | D | Compulsory | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 22 | 150 | 6 |
| CEN 311 | Web Technologies and Programming | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 70 | 0 | 150 | 6 |
| | Technical Elective | C | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 0 | 0 | 118 | 0 | 150 | 6 |
| | Technical Elective | C | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 0 | 0 | 118 | 0 | 150 | 6 |
| Semestral Total | | | | 10 | 4 | 4 | 18 | 14 | 160 | 0 | 64 | 504 | 0 | 750 | 30 |

**Third Year**

**Sixth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 308 | Operating Systems | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 70 | 0 | 150 | 6 |
| CEN 302 | Software Engineering | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 70 | 0 | 150 | 6 |
| CEN 390/ CEN 399 | Graduation Project/ Final Comprehensive Exam | E | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 118 | 0 | 150 | 6 |
| | Technical Elective | C | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 118 | 0 | 150 | 6 |
| | Technical Elective | C | Elective | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| Semestral Total | | | | 12 | 4 | 6 | 22 | 17 | 192 | 64 | 96 | 462 | 0 | 750 | 30 |

**Technical Electives**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 326 | Fundamentals System Administration | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 328 | Programming Languages I | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CEN 330 | Parallel Programming | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 332 | Simulation and Modeling | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 336 | Computer Graphics | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 338 | Management Information Systems | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 346 | Mobile Programming | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 348 | Internship | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 350 | Theory of Computation | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 352 | Artificial Intelligence | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 354 | Web Engineering | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 356 | XML and WEB Services | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 358 | Computer Graphics | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 366 | Digital Data Communication | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 368 | Network Security | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 370 | Distributed Systems | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 374 | Mobile and Wireless Networking | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 376 | Data Mining | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 380 | Machine Learning | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 386 | Management Information Systems | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 389 | Embedded Systems | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 340 | Smartphone Applications | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 309 | Analysis of Algorithms | B | Elective | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |

# FACULTY OF ARCHITECTURE AND ENGINEERING
# DEPARTMENT OF COMPUTER ENGINEERING
# 3 (THREE) YEARS BACHELOR DIPLOMA IN ELECTRONICS AND DIGITAL COMMUNICATION ENGINEERING

**First Year**

**First Semester**

| COURSES | | | | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | Course Type | Compulsory /Elective | Theory | Pract | Lab | Total | Credits | Lect | Pract | Lab | Site W. | Other | Total | |
| MTH 103 | Linear Algebra | A | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 5 |
| CEN 109 | Introduction to Algorithms & Programming | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| MTH 101 | Calculus I | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| PHY 101 | General Physics I | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| ENG 103 | Development of Reading and Writing Skills in English I | D | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 15 | 4 | 2 | 21 | 18 | 240 | 64 | 32 | 414 | 0 | 750 | 30 |

**First Year**

**Second Semester**

| COURSES | | | | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | Course Type | Compulsory /Elective | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| MTH 106 | Discrete Mathematics | C | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 5 |
| CEN 110 | C Programming | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| MTH 102 | Calculus II | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| PHY 104 | General Physics II | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| ENG 104 | Development of Reading and Writing Skills in English II | D | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 15 | 4 | 2 | 21 | 18 | 240 | 64 | 32 | 414 | 0 | 750 | 30 |

**Second Year**
**Third Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Le ct. | Pract. | Lab. | Site W. | Other | Total | |
| ECE 201 | Signals and Systems | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| ECE 203 | Circuit Theory | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| CEN 219 | Computer Organization | B | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| MTH 207 | Fundamentals of Probability | C | Compulsory | 4 | 0 | 0 | 4 | 4 | 64 | 0 | 0 | 86 | 0 | 150 | 6 |
| | Non technical elective | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 15 | 2 | 4 | 21 | 18 | 240 | 32 | 64 | 414 | 0 | 750 | 30 |

**Non-technical electives**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| BUS 103 | Introduction to Business | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 201 | Turkish I | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 203 | German I | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 205 | Italian I | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 207 | French I | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |

**Second Year**
**Fourth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| ECE 202 | Electromagnetic Field Theory | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| ECE 204 | Electronics I | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| ECE 206 | Digital Electronics I | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| ECE 208 | Numerical Analysis | C | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| | Non technical elective | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 13 | 2 | 6 | 21 | 17 | 208 | 32 | 96 | 414 | 0 | 750 | 30 |

**Non-technical electives**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| BUS 103 | Introduction to Business | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 202 | Turkish II | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 204 | German II | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 206 | Italian II | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| FL 208 | French II | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |

**Third Year**

**Fifth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| ECE 301 | Electronics II | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| ECE 303 | Electromagnetic Waves | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| ECE 305 | Digital Communication I | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| ECE 307 | Computer Networks | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECE 351 | Professional Practice | D | Compulsory | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 22 | 150 | 6 |
| Semestral Total | | | | 8 | 0 | 8 | 16 | 12 | 128 | 0 | 128 | 472 | 22 | 750 | 30 |

**Third Year**
**Sixth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| ECE 302 | Antennas and Propagation | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| ECE 304 | Control Systems | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| ECE 306 | Power Electronics | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| ECE 3xx | Technical Elective | C | Elective | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| ECE 390 | Graduation Project | E | Compulsory | 1 | 4 | 0 | 5 | 3 | 16 | 64 | 0 | 70 | 0 | 150 | 6 |
| ECE 399 | Final Comprehensive Exam | | Compulsory | 1 | 4 | 0 | 5 | 3 | 16 | 64 | 0 | 70 | 0 | 150 | 6 |
| Semestral Total | | | | 9 | 4 | 8 | 21 | 15 | 144 | 64 | 128 | 414 | 0 | 750 | 30 |

**Technical electives**

| COURSES | | Compulsory /Elective | Course Type | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| ECE 310 | Communication Theory | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| From CEN | Web Technologies and Programming | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 325 | Telecommunication Circuits | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 318 | Multimedia Signal Distribution | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 320 | Computer Graphics | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 324 | Computer Animation | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 326 | Digital Photography | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 330 | Microwaves | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECE 332 | Introduction to Optical Fibers | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 334 | Digital Data Transmission | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 336 | Digital Signal Processing | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 338 | Satellite Communication | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 384 | Microcontrollers | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 342 | Fundamentals of Audio Engineering | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 340 | Internship | Elective | C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 150 | 6 |
| ECE 346 | Television Technique | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| CEN 308 | Operating Systems | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 358 | Information Theory and Coding | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 366 | Introduction to Nanoscience and Nanotechnology | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| CEN 370 | Distributed Systems | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| CEN 328 | Programming Languages I | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 312 | Digital Multimedia | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |
| ECE 348 | Communication Theory | Elective | C | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 102 | 0 | 150 | 6 |

## FACULTY OF ARCHITECTURE AND ENGINEERING
## DEPARTMENT OF COMPUTER ENGINEERING
## (THREE) YEARS BACHELOR DIPLOMA IN SOFTWARE ENGINEERING

**First Year**

**First Semester**

| COURSES | | Course | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Lecture and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | Type | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 105 | Linear Algebra | A | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 5 |
| CEN 109 | Introduction to Algorithms & Programming | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| MTH 101 | Calculus I | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| PHY 101 | General Physics I | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| ENG 103 | Development of R. & W. Skills In English I | D | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 15 | 4 | 2 | 21 | 18 | 240 | 64 | 32 | 414 | 0 | 750 | 30 |

**First Year**

**Second Semester**

| COURSES | | Course | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | Type | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| MTH 106 | Discrete Mathematics | A | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 5 |
| CEN 110 | C Programming | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| MTH 102 | Calculus II | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| SWE 101 | Introduction to Software Engineering | B | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 95 | 0 | 175 | 7 |
| ENG 104 | Development of R. & W. Skills In English II | D | Compulsory | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 15 | 4 | 2 | 21 | 18 | 240 | 64 | 32 | 414 | 0 | 750 | 30 |

**Second Year**
**Third Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 215 | Object Oriented Programming | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| CEN 203 | Database Management Systems | B | Compulsory | 3 | 1 | 1 | 5 | 4 | 48 | 16 | 16 | 95 | 0 | 175 | 7 |
| CEN 219 | Computer Organization | C | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| MTH 207 | Fundamental of Probability | A | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| | Non Technical Elective | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 13 | 5 | 3 | 21 | 17 | 208 | 80 | 48 | 414 | 0 | 750 | 30 |

**Second Year**
**Fourth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| SWE 202 | Software Modeling and Design | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| SWE 211 | Programming Language Paradigms | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| CEN 206 | Data Structures | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 95 | 0 | 175 | 7 |
| CEN 311 | Web Technologies and Programming | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| | Non Technical Elective | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| Semestral Total | | | | 13 | 0 | 8 | 21 | 17 | 208 | 0 | 128 | 414 | 0 | 750 | 30 |

**Non technical electives**

| COURSES | | | | Weekly Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | Course Type | Compulsory /Elective | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| BUS 103 | Introduction to Business | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| BUS 114 | Communication Skills | C | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |
| LAW 105 | Introduction to Law | D | Elective | 3 | 0 | 0 | 3 | 3 | 48 | 0 | 0 | 52 | 0 | 100 | 4 |

**Third Year**

**Fifth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 307 | Computer Networks | C | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 70 | 0 | 150 | 6 |
| CEN 309 | Analysis of Algorithms | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| SWE 303 | Software Testing and Quality Assurance | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| CEN 376 | Data Mining | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| | Technical Elective | C | Elective | 2 | 2 | 0 | 4 | 3 | 48 | 32 | 0 | 86 | 0 | 100 | 6 |
| Semestral Total | | | | 11 | 2 | 8 | 21 | 16 | 176 | 32 | 128 | 414 | 0 | 750 | 30 |

**Third Year**

**Sixth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | Epoka | | Semestral Course and studying hours | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 308 | Operating Systems | B | Compulsory | 3 | 0 | 2 | 5 | 4 | 48 | 0 | 32 | 70 | 0 | 150 | 6 |
| SWE 302 | Software Project Management | B | Compulsory | 2 | 0 | 2 | 4 | 3 | 32 | 0 | 32 | 86 | 0 | 150 | 6 |
| CEN XXX | Technical Elective | C | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN XXX | Technical Elective | C | Compulsory | 2 | 2 | 0 | 4 | 3 | 32 | 32 | 0 | 86 | 0 | 150 | 6 |
| CEN 390 | Graduation project/ final exam | C | Compulsory | 1 | 4 | 0 | 5 | 3 | 16 | 64 | 0 | 70 | 0 | 100 | 6 |
| Semestral Total | | | | 10 | 8 | 4 | 22 | 16 | 160 | 128 | 64 | 398 | 0 | 750 | 30 |

**Technical electives**

| COURSES | | Compulsory /Elective | Course Type | Weekly Course Distribution | | | Epoka | Semestral Course and studying hours | | | | | | ECTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 326 | Fundamentals of System Administration | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |
| CEN 328 | Programming Languages I | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |
| CEN 336 | Computer Graphics | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |
| CEN 338 | Management Information Systems | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |
| CEN 352 | Artificial Intelligence | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |
| CEN 351 | Multimedia and Graphic Design | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |
| CEN 366 | Digital Data Communication | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |
| CEN 389 | Embedded Systems | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CEN 340 | Smartphone Applications | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |
| CEN 342 | User Interface Design | Elective | B | 2 | 2 | 0 | 4 | 3 | 48 | 0 | 0 | 77 | 0 | 125 | 6 |

# Graduate Teaching

## FACULTY OF ARCHITECTURE AND ENGINEERING
## DEPARTMENT OF COMPUTER ENGINEERING
## MASTER OF SCIENCE PROGRAM IN COMPUTER ENGINEERING

**FIRST YEAR**

**First Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Lecture and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 409 | Research Methods | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| Semestral Total | | | | 12 | 8 | 0 | 20 | 16 | 192 | 128 | 0 | 430 | 0 | 750 | 30 |

**FIRST YEAR**

**Second Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Course and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| Semestral Total | | | | 12 | 8 | 0 | 20 | 16 | 192 | 128 | 0 | 430 | 0 | 750 | 30 |

**SECOND YEAR**

**Third Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Lecture and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 593 | Graduate Project | D | Compulsory | 1 | 9 | 0 | 10 | 5.5 | 16 | 144 | 0 | 215 | 0 | 375 | 15 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| Semestral Total | | | | 7 | 13 | 0 | 20 | 13.5 | 112 | 208 | 0 | 430 | 0 | 750 | 30 |

**SECOND YEAR**

**Fourth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Course and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 500 | Thesis | E | Compulsory | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 750 | 0 | 750 | 30 |
| Semestral Total | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 750 | 0 | 750 | 30 |

**List of Elective courses:**

| COURSES | | Course Type | Compulsory / Elective | Weekly Course Distribution | | | | Epoka | Semestral Lecture and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 553 | Theory of Computation | B | Elective | 1 | 9 | 0 | 10 | 5.5 | 16 | 144 | 0 | 215 | 0 | 187.5 | 7.5 |
| CEN 514 | Randomized Algorithm | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 567 | Advanced Algorithms & Data structures | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 552 | Advanced Database Management System | B | Elective | 1 | 9 | 0 | 10 | 5.5 | 16 | 144 | 0 | 215 | 0 | 375 | 7.5 |
| CEN 415 | Information Retrieval | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 592 | Knowledge Management | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CEN 571 | Data Mining | B | Elective | 1 | 9 | 0 | 10 | 5.5 | 16 | 144 | 0 | 215 | 0 | 375 | 7.5 |
| CEN 563 | Adv. Concepts in computer Networks | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 564 | Wireless Networks | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 462 | Network Security | B | Elective | 1 | 9 | 0 | 10 | 5.5 | 16 | 144 | 0 | 215 | 0 | 375 | 7.5 |
| CEN 531 | Information Security and | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| | Computer Forensics | | | | | | | | | | | | | | |
| CEN 461 | Network Programming | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 539 | Nano-Science and Nano Technology | B | Elective | 1 | 9 | 0 | 10 | 5.5 | 16 | 144 | 0 | 215 | 0 | 375 | 7.5 |
| CEN 565 | Bioinformatics | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 555 | Nano biomaterials | B | Elective | 1 | 9 | 0 | 10 | 5.5 | 16 | 144 | 0 | 215 | 0 | 375 | 7.5 |
| CEN 509 | Tissue Engineering | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |

# FACULTY OF ARCHITECTURE AND ENGINEERING
# DEPARTMENT OF COMPUTER ENGINEERING
# MASTER OF SCIENCE IN ELECTRONICS AND COMMUNICATION ENGINEERING

**First Year**
**First Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Lecture and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract | Lab | Total | Credits | Lect | Pract. | Lab | Site W. | Other | Total | |
| CEN 409 | Research Methods | A | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| ECE 512 | Digital Communication Systems | B | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| ECE xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| ECE xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| Semestral Total | | | | 12 | 8 | 0 | 20 | 16 | 192 | 128 | 0 | 430 | 0 | 750 | 30 |

**First Year**

**Second Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Course and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 545 | Advanced Numerical Methods | B | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| ECE 520 | Integrated Systems | B | Compulsory | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| ECE xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| ECE xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| Semestral Total | | | | 12 | 8 | 0 | 20 | 16 | 192 | 128 | 0 | 430 | 0 | 750 | 30 |

**Second Year**
**Third Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Lecture and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| ECE 590 | Term Project | D | Compulsory | 1 | 4 | 0 | 5 | 4 | 16 | 64 | 0 | 215 | 0 | 187.5 | 7.5 |
| ECE xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| ECE xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| ECE xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| Semestral Total | | | | 10 | 10 | 0 | 20 | 16 | 160 | 160 | 0 | 430 | 0 | 750 | 30 |

**Second Year**
**Fourth Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Course and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| ECE 500 | Thesis | E | Compulsory | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 750 | 0 | 750 | 30 |
| Semestral Total | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 750 | 0 | 750 | 30 |

**List of Elective courses:**

| Course Code | Course Name | T | P | C | ECTS |
|---|---|---|---|---|---|
| ECE 433 | Introduction on to Neural Networks | 3 | 2 | 4 | 7.5 |
| ECE 439 | Electronics for Bioengineering Applications | 3 | 2 | 4 | 7.5 |
| ECE 445 | Advanced Optical Communication | 3 | 2 | 4 | 7.5 |
| ECE 464 | Automatic Control Systems | 3 | 2 | 4 | 7.5 |
| ECE 468 | Computer Vision | 3 | 2 | 4 | 7.5 |
| ECE 472 | Special Topics in Artificial Intelligence | 3 | 2 | 4 | 7.5 |

| | | | | | |
|---|---|---|---|---|---|
| ECE 478 | Industrial Electronics | 3 | 2 | 4 | 7.5 |
| ECE 483 | Computer Architecture | 3 | 2 | 4 | 7.5 |
| ECE 533 | Advanced Antenna Theory | 3 | 2 | 4 | 7.5 |
| ECE 537 | Advanced Topics in Mobile Cellular Communication Systems | 3 | 2 | 4 | 7.5 |
| ECE 541 | Design of Embedded Systems | 3 | 2 | 4 | 7.5 |

# FACULTY OF ARCHITECTURE AND ENGINEERING
# DEPARTMENT OF COMPUTER ENGINEERING
# PROFESSIONAL MASTER PROGRAM IN COMPUTER ENGINEERING

**FIRST YEAR**

**First Semester**

| COURSES | | Course Type | Compulsory / Elective | Weekly Course Distribution | | | | Epoka | Semestral Lecture and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN xxx | Elective | A | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | C | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| Semestral Total | | | | 12 | 8 | 0 | 20 | 16 | 192 | 128 | 0 | 430 | 0 | 750 | 30 |

**FIRST YEAR**

**Second Semester**

| COURSES | | Course Type | Compulsory /Elective | Weekly Course Distribution | | | | Epoka | Semestral Lecture and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 590 | Term Project | E | Compulsory | 1 | 4 | 0 | 5 | 3 | 16 | 64 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | D | Compulsory | 1 | 4 | 0 | 5 | 3 | 16 | 64 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | C | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN xxx | Elective | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| Semestral Total | | | | 8 | 12 | 0 | 20 | 14 | 128 | 192 | 0 | 430 | 0 | 750 | 30 |

**List of Elective courses:**

| COURSES | | Course Type | Compulsory / Elective | Weekly Course Distribution | | | | Epoka | Semestral Lecture and studying hours | | | | | | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | Course Name | | | Theory | Pract. | Lab. | Total | Credits | Lect. | Pract. | Lab. | Site W. | Other | Total | |
| CEN 553 | Theory of Computation | C | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CEN 514 | Randomized Algorithm | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 567 | Advanced Algorithms & Data structures | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 552 | Advanced Database Management System | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 415 | Information Retrieval | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 592 | Knowledge Management | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 571 | Data Mining | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 563 | Adv. Concepts in computer Networks | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 564 | Wireless Networks | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 462 | Network Security | C | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 531 | Information Security and Computer Forensics | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 461 | Network Programming | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 593 | Nano-Science and Nano-Technology | C | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 565 | Bioinformatics | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 555 | Nanobiomaterials | C | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 509 | Tissue Engineering | B | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 545 | Advanced Numerical Methods | A | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |
| CEN 535 | Advanced Mathematics for Computer Science | A | Elective | 3 | 2 | 0 | 5 | 4 | 48 | 32 | 0 | 107.5 | 0 | 187.5 | 7.5 |

## THE CURRICULUM OF PHD IN COMPUTER ENGINEERING STUDY PROGRAM:

| **Year I - First Semester** | | **T** | **P** | **C** | **ECTS** |
|---|---|---|---|---|---|
| CEN 8xx | ELECTIVE COURSE | 3 | 0 | 3 | 7.5 |
| CEN 8xx | ELECTIVE COURSE | 3 | 0 | 3 | 7.5 |
| CEN 8xx | ELECTIVE COURSE | 3 | 0 | 3 | 7.5 |
| CEN 8xx | ELECTIVE COURSE | 3 | 0 | 3 | 7.5 |
| **Total:** | | **12** | **0** | **12** | **30** |

| **Year I - Second Semester** | | **T** | **P** | **C** | **ECTS** |
|---|---|---|---|---|---|
| CEN 8xx | ELECTIVE COURSE | 3 | 0 | 3 | 7.5 |
| CEN 8xx | ELECTIVE COURSE | 3 | 0 | 3 | 7.5 |
| CEN 8xx | ELECTIVE COURSE | 3 | 0 | 3 | 7.5 |
| CEN 8xx | ELECTIVE COURSE | 3 | 0 | 3 | 7.5 |
| **Total:** | | **12** | **0** | **12** | **30** |

| **Year II+III** | | **T** | **P** | **C** | **ECTS** |
|---|---|---|---|---|---|
| CEN 800 | PhD THESIS | 0 | 0 | 0 | 120 |
| **Total:** | | 0 | 0 | 0 | **120** |

**Note:** **T** – Theoretical hours
**P** – Practical hours
**C** – Credits according to American System
**ECTS** – Credits according to ECTS System

**List of elective courses:**

| **Course Code** | **Course Name** | **T** | **P** | **C** | **ECTS** |
|---|---|---|---|---|---|
| CEN 801 | Special Topics in Software Engineering | 3 | 0 | 3 | 7.5 |
| CEN 802 | Complex Systems | 3 | 0 | 3 | 7.5 |
| CEN 803 | Software Project Management | 3 | 0 | 3 | 7.5 |
| CEN 804 | Advanced Topics in Computer Engineering | 3 | 0 | 3 | 7.5 |
| CEN 805 | Operating System Design | 3 | 0 | 3 | 7.5 |
| CEN 806 | Distributed Systems | 3 | 0 | 3 | 7.5 |
| CEN 807 | Object Oriented Software Engineering | 3 | 0 | 3 | 7.5 |
| CEN 809 | Research Methods | 3 | 0 | 3 | 7.5 |
| CEN 811 | Advanced Object Oriented Programming | 3 | 0 | 3 | 7.5 |
| CEN 813 | Formal Languages & Compilers | 3 | 0 | 3 | 7.5 |
| CEN 814 | Metaheuristics | 3 | 0 | 3 | 7.5 |
| CEN 815 | Information Retrieval | 3 | 0 | 3 | 7.5 |
| CEN 816 | Mobile Applications Programming | 3 | 0 | 3 | 7.5 |

| | | | | | |
|---|---|---|---|---|---|
| CEN 818 | System Administration I | 3 | 0 | 3 | 7.5 |
| CEN 819 | System Administration II | 3 | 0 | 3 | 7.5 |
| CEN 820 | Theory of Computation | 3 | 0 | 3 | 7.5 |
| CEN 821 | Web Engineering | 3 | 0 | 3 | 7.5 |
| CEN 823 | XML and Web Services | 3 | 0 | 3 | 7.5 |
| CEN 825 | E-Business and E-commerce | 3 | 0 | 3 | 7.5 |
| CEN 827 | Directed Study I | 3 | 0 | 3 | 7.5 |
| CEN 828 | Directed Study II | 3 | 0 | 3 | 7.5 |
| CEN 831 | Information Security and Computer Forensics | 3 | 0 | 3 | 7.5 |
| CEN 833 | Advanced Simulation and Modelling | 3 | 0 | 3 | 7.5 |
| CEN 835 | Advanced Math for Computer Science | 3 | 0 | 3 | 7.5 |
| CEN 873 | Artificial Neural Networks | 3 | 0 | 3 | 7.5 |
| CEN 839 | Introduction to Nano-Science and Nano-Technology | 3 | 0 | 3 | 7.5 |
| CEN 843 | Digital Image Processing | 3 | 0 | 3 | 7.5 |
| CEN 845 | Advanced Numerical Methods | 3 | 0 | 3 | 7.5 |
| CEN 848 | Programming Languages I | 3 | 0 | 3 | 7.5 |
| CEN 849 | Programming Languages II | 3 | 0 | 3 | 7.5 |
| CEN 850 | Programming Languages III | 3 | 0 | 3 | 7.5 |
| CEN 851 | Speech Processing | 3 | 0 | 3 | 7.5 |
| CEN 852 | Advanced Database Management Systems | 3 | 0 | 3 | 7.5 |
| CEN 853 | Design and Analysis of Algorithms | 3 | 0 | 3 | 7.5 |
| CEN 855 | Bioinformatics | 3 | 0 | 3 | 7.5 |
| CEN 856 | Introduction to Cloud Computing | 3 | 0 | 3 | 7.5 |
| CEN 861 | Network Programming | 3 | 0 | 3 | 7.5 |
| CEN 862 | Network Security | 3 | 0 | 3 | 7.5 |
| CEN 864 | Wireless Networks | 3 | 0 | 3 | 7.5 |
| CEN 865 | Tissue Engineering | 3 | 0 | 3 | 7.5 |
| CEN 871 | Data Mining | 3 | 0 | 3 | 7.5 |
| CEN 872 | Special Topics in Artificial Intelligence | 3 | 0 | 3 | 7.5 |
| CEN 870 | Cryptography | 3 | 0 | 3 | 7.5 |
| CEN 874 | Fuzzy Logic | 3 | 0 | 3 | 7.5 |
| CEN 875 | Computer Vision | 3 | 0 | 3 | 7.5 |
| CEN 876 | Management Information Systems | 3 | 0 | 3 | 7.5 |
| CEN 877 | Nanomaterials | 3 | 0 | 3 | 7.5 |
| CEN 878 | Machine Learning | 3 | 0 | 3 | 7.5 |
| CEN 879 | Randomized Algorithms | 3 | 0 | 3 | 7.5 |
| CEN 881 | Information Theory | 3 | 0 | 3 | 7.5 |
| CEN 883 | Computer Architecture | 3 | 0 | 3 | 7.5 |
| CEN 884 | Design of Embedded Systems | 3 | 0 | 3 | 7.5 |
| CEN 885 | Parallel Computing | 3 | 0 | 3 | 7.5 |
| CEN 886 | Advanced Computer Architecture | 3 | 0 | 3 | 7.5 |
| CEN 887 | Advanced Topics in Computer Science | 3 | 0 | 3 | 7.5 |
| CEN 863 | Advanced Concepts in Computer Networks | 3 | 0 | 3 | 7.5 |
| CEN 892 | Knowledge Management | 3 | 0 | 3 | 7.5 |
| CEN 869 | Theory of Computation | 3 | 0 | 3 | 7.5 |
| CEN 867 | Advanced Algorithms and Datastructures | 3 | 0 | 3 | 7.5 |

# D. Teaching, Learning, Assessment & Research

## Undergraduate Students' List of Theses

### BA CEN & ECE

1. Kristina Lagji, "Design of Miniaturized Electronic Circuits for Electrochemical Measurements", Dr. Arban Uka.
2. Rinald Shabani, "Visually Translating the American Sign Language Fingerspelling Alphabet", Dr. Arban Uka.
3. Besimr Shehu, "Fourier Ptychography Analysis of Datasets Probed with Laser Illumination in Varying Light Spectrum Varying Light Spectrum", Dr. Arban Uka.
4. Bjorna Qesaraku, "Effect of Refocusing in Fourier Ptychographic Microscopy", Dr. Arban Uka.
5. Ismiana Qose, "A Lab Book in Fourier Ptychographic Microscopy", Dr. Arban Uka.
6. Emine Tatari, "Identity Management in Banking System", Dr. Arban Uka.
7. Stela Lila, "A Lab Book to Digital in Line Holography: Algorithm Narration with Experimental Illustrations" Dr. Arban Uka.
8. Dorjan Dafku, "Building a CT scan COVID- 19 Classifier using PYTORCH" Dr. Julian Hoxha
9. Nikolas Lulja, "Graph Neural Network for Shortest Path", Dr. Julian Hoxha.
10. Andi Gjini, "Text Mining and Sentimental Analysis", Dr. Maaruf Ali.
11. Klea Brahimllari, "Text Mining and Sentimental Analysis", Dr. Julian Hoxha
12. Andi Manga, "Diffuser cam: Lensless Imaging", Dr. Arban Uka
13. Kevin Haxhi, "Face Recognition with Raspberry PI", Dr. Arban Uka
14. Armela Ligori, "Fine-tuning transformer models for COVID-19 potential cases detection in social media", M.Sc. Enea Mançellari.
15. Denado Rabeli, "The design and implementation of EPOKA University Chatbot", M.Sc. Enea Mançellari.
16. Arjol Pançi, "Image Segmenatation Using Convolutional Neural Networks for Biomedical Images", Dr. Arban Uka

17. Levina Përzhilla, “Modelling of Cell Growth”, Dr. Arban Uka
18. Kejdi Domi, “Classification of Laptop Computer market using Fuzzy clustering: case study Albania market”, M. Sc. Enea Mançellari
19. Dejvi Zelo, “Biomaterial Segmentation in Medical Images Using the U-NET Network”, Dr. Arban Uka
20. Fridi Shehaj, “Object Detection using Deep Learning Neural Networks”, Dr. Arban Uka
21. Alba Meça, “Parameter Estimation of Three Cells Interaction Using Lotka Volterra Differential Equations”, Dr. Arban Uka
22. Anila Hoxha, “Detection of main factors influencing depression in the workplace using FIS and Fuzzy clustering”, M. Sc. Enea Mançellari.
23. Rei Balla, “Docify: Verify Records on Ethereum”, M. Sc. Enea Mançellari
24. Enxhi Duka, “Penetration Testing Through Social Engineering”, Dr. Julian Hoxha
25. Kevin Çuedari, “Cell Image Classification Using Convolutional Neural Networks”, Dr. Arban Uka
26. Devid Duma, “A survey into introductory topics of reinforcement learning”, M. Sc. Enea Mançellari
27. Evelin Uliu, “Analysis, Design and Implementation of an Online Learning Community Management System in Albania”, M. Sc. Xhoena Polisi
28. Nataneal Xhelilaj, “Artificial Intelligence Face Recognition for Identification Systems and Access Granting”, Dr. Maaruf Ali.
29. Denada Rama, “Invasive Ductal Carcinoma Detection in Breast Histopathology Images Using Machine Learning Methods”, Dr. Julian Hoxha.
30. Amanda Boçi, “Service Management System Case Study: “Elmed- Service”, Dr. Igli Hakrama
31. Xhulio Isufi, “Classifying COVID- 19 Patients for Hospitalization, ICU and Intubation via Machine Learning Methods”, M. Sc. Xhoena Polisi
32. Bjorn Rexhepi, “Object Detection in Deep Learning Algorithm”, Dr. Julian Hoxha
33. Gersjan Nano, “Application of Deep Learning Algorithms for Object Detection with Detectron2”, Dr Julian Hoxha
34. Xhesika Biçaku, “Development of Methodology and Technology for Laplace Transformations: Direct&Inverse”, Assoc. Prof. Dr. Carlo Ciulla

35. Kristi çuni, “Hand Tracking Software and Potential Implementations”, M.Sc. Florenc Skuka
36. Amelia Agolli, “Testing and Analysis of Image Restoration using Variational Autoencoders”, Dr. Igli Hakrama
37. Ina Sholli, “Pytorch for Corona Virus Detection”, Dr. Julian Hoxha.
38. Xhoana Qosja, “Book Recommendation System using Hybrid Recommendation methods”, M.Sc. Enea Mançellari
39. Dylber Çaushi, “Renewable Energy in Albania”, Dr. Maaruf Ali.
40. Serxhio Gorka, “Blockchain Technology”, Dr. Maaruf Ali.
41. Elvis Ruci, “Super Resolution for Microscopy Image Enhancing”, M. Sc. Xhoena Polisi.
42. Erisa Kazaferi, “Automatic Cell Detection Using Convolutional Networks, M. Sc. Xhoena Polisi.
43. Flavio Hilaj, “Creation of Patients Survey/ Reporting Services”, M.Sc. Xhoena Polisi.
44. Sonia Memaj, “Cell Image Segmentation with U-Net”, Dr. Arban Uka.
45. Ledia Leka, “Student Professional Practice Market Studentship”, Dr. Arban Uka.
46. Ergys Rrjoli, “Analysis, Design and Implementation of a Geospatial Issue Tracker, “Dr. Igli Hakrama.
47. Juxhin Allaisufi, “Sign Language Recognition”, Dr. Igli Hakrama.
48. Martina Kajana “Promoting Gender Equality Through Media: ‘Awomen’ Website”, Assoc. Prof. Dr. Carlo Ciulla.
49. Jasmina Gaxheri, “Travel Agency webpage and management systems”, Assoc. Prof. Dr. Carlo Ciulla.
50. Egnatis Basha “Allergy Prediction and Its Use in The Ecological World”, Assoc. Prof. Dr. Carlo Ciulla.
51. Xhesika Biçaku “Development of Methodology And Technology For Laplace Transformations: Direct & Inverse”, Assoc. Prof. Dr. Carlo Ciulla.
52. Raziena Uruçi “Development Of Methodology And Technology for Z Transformations: Direct & Inverse”, Assoc. Prof. Dr. Carlo Ciulla.
53. Klejda Kumi “Development of Methodology and Technology for Fourier Transformations: Direct & Inverse”, Assoc. Prof. Dr. Carlo Ciulla.

## Graduate Students' List of Theses

**MSC CEN & ECE**

1. Elda Hoxhaj, "Phishing Detection Using Machine Learning", Assoc. Prof. Dr. Carlo Ciulla.
2. Anica Papadhima "Phishing Attacks Detection Using Machine Learning Methods on URLs Features", Dr. Maaruf Ali.
3. Gent Imeraj "Fourier Ptychography Microscopy-Probability and Computation Probed by Point of Care Analysis", Dr. Arban Uka.
4. Erilda Muka "A Case Study of Penetration Testing for Android Devices", Dr. Maaruf Ali.
5. Igli Tola "Association Rule Mining with Tweets: Thinking Outside the Basket", Dr. Maaruf Ali.
6. Ledio Bahja "LBP Analysis of the Images", Dr. Maaruf Ali.
7. Pironada Nako "Hacking on Android: Practical uses of Backdoors, Keyloggers and Penetration Testing", Dr. Julian Hoxha.
8. Erigen Hoxha "MPLS Implementation on Layer 3 Protocols", Dr. Julian Hoxha.
9. Evliona Pilafi "Technology's Impact on the Banking System and Consumer Behavior. Albania's of E-Banking in Commercial Banks", Dr. Maaruf Ali.
10. Deni Troshani "Honeypot Systems", Dr. Julian Hoxha.
11. Riad Saker "Creating Real Life Smart Environments Using Packet Tracer", Dr. Julian Hoxha
12. Edit Dollani "Cell Image Classification Using Convolutional Nerual Networks and Different Image Preprocessing Techniques", Dr. Arban Uka.
13. Ari Gjerazi "Using Faster RCNN for Cell Image Detection", Dr. Arban Uka.
14. Eraldo Çenga "Virtualization and Teleportation of Files Among Virtual Boxes", Dr. Julian Hoxha.
15. Igli Draci "U^3- Net: Nested Convolutional Neural Networks for Biomedical Image Segmentation", Dr. Arban Uka.
16. Johan Note "Intrusion Detection System Using Machine Learning and Deep Learning Algorithms", Dr. Maaruf Ali.

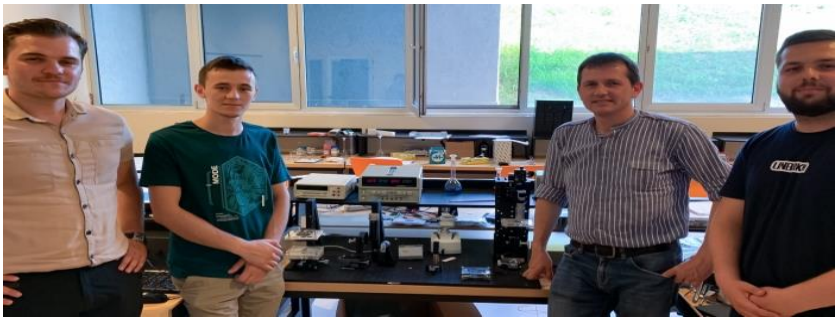
17. Sajdi Muda “A Review on Adversarial Attacks Against Neural Networks and their Defense Methods”, Dr. Arban Uka.
18. Jaser Sokoli “Acomparative Study of two Subspace Clustering Algorithms: Predecon and Clique”, Dr. Julian Hoxha.
19. Baftjar Tabaku “Protecting Web Applications from Web Scrapping”, Dr. Maaruf Ali.

### List of Incoming & Outgoing Students

There are no incoming & outgoing students during 2020-2021.

## Research Areas and Research Groups

Researchers at EPOKA University always aim to implement their knowledge for the construction of useful tools and components that would improve the quality of life. Same path is followed by the members of the Image Acquisition and Analysis Lab (IAAL) at the Department of Computer Engineering. Their work includes the construction of portable microscopy units, computational imaging and image analysis employing artificial intelligence techniques. Recently their work was featured on outreach media of the European Union. In the interview Dr. Arban Uka explained the work they conduct in IAAL, the international and national collaborations that they have and also the experience with the implementation of the European projects. He talked about the inherent challenges but added also the elements that enable the implementation of quality work. He explicitly thanked the support both at the institutional level for the creation of research conditions, and at the national level for the adaptation of the necessary laws that facilitate optimal settings for specific research frameworks.



# List of Publications

| The List of Scientific Publications for 2020-2021 Academic Year | | | | |
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| **No.** | **Lecturer** | **Scientific Publications and Academic Activities** | **Depart** | **Type** |
| 1 | Dr. Arban Uka | Uka, A., Halili, A. N., Polisi, X., Topal, A. O., Imeraj, G., & Vrana, N. E. (2021). Basis of image analysis for evaluating cell biomaterial interaction using brightfield microscopy. *Cells Tissues Organs*, *210*(2), 77-104.<br><br>**Article link**<br>https://www.karger.com/Article/Abstract/512969<br>https://doi.org/10.1159/000512969<br><br>**About this journal**<br>https://www.karger.com/Journal/Home/224197<br><br>**About the index**<br>https://www.karger.com/Journal/Home/224197<br>**Impact Factor 2.481** | CEN | Article |
| 2 | Dr. Maaruf Ali | MAHDI H. MIRAZ, **MAARUF ALI**, PETER S. EXCELL, "Cross-cultural Usability Evaluation of AI-based Adaptive User Interface for Mobile Applications", *Acta Scientiarum - Technology*. p-ISSN 1806-2563; e-ISSN 1807-8664 (on-line). Publisher: Universidade Estadual de Maringa, Brazil<br><br>**Article link**<br>Accepted, November, 2021. See attached acceptance letter from the journal.<br><br>**About this journal**<br>https://periodicos.uem.br/ojs/index.php/ActaSciTechnol/index<br>p-ISSN 1806-2563; e-ISSN 1807-8664 (on-line). Publisher: Universidade Estadual de Maringa, Brazil<br><br>**About the index**<br>https://www.scopus.com/sourceid/18300156736<br>Scopus Cite Score (2020): 0.9. Q3 ranked 36% in Mathematics. SNIP: 0.375. SJR: 0.183.<br>Clarivate Analytics (2021): Impact Factor: 0.550; Eigenfactor: 0.000420.<br><br>https://www.scimagojr.com/journalsearch.php?q=18300156736&tip=sid&clean=0<br>H Index: 17 | CEN | Article |
| 3 | Dr. Maaruf Ali | FETAJI B., FETAJI M., EBIBI M., **ALI M.** (2021) Predicting Diabetes Using Diabetes Datasets and Machine Learning Algorithms: Comparison and Analysis. In: Miraz M.H., Southall G., Ali M., Ware A., Soomro S. (eds) Emerging Technologies in Computing. iCETiC 2021. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 395, pp. 185-193. Springer, Cham.<br><br>First Online: 04 November 2021.<br><br>**Article Link**<br>https://doi.org/10.1007/978-3-030-90016-8_13<br><br>**About the Book** | CEN | Book Chapter |

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| | | Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 395. Springer Cham, 2021.<br>Print ISBN 978-3-030-90015-1; Online ISBN 978-3-030-90016-8. Series Print ISSN 1867-8211. Series Online ISSN 1867-822X.<br><br>**About the Index**<br>Q4, SJR 2020: 0.142. SNIP: 0.187. Cite Score: 0.7.<br><br>https://www.scimagojr.com/journalsearch.php?q=21100220348&tip=sid<br>H Index: 44. | | |
| 4 | Dr. Maaruf Ali | TABAKU B., **ALI M**. (2021) Protecting Web Applications from Web Scraping. In: Miraz M.H., Southall G., Ali M., Ware A., Soomro S. (eds) Emerging Technologies in Computing. iCETiC 2021. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 395. Pp. 56-70. Springer, Cham.<br><br>First Online: 04 November 2021.<br><br>**Article Link**<br>https://doi.org/10.1007/978-3-030-90016-8_4<br><br>**About the Book**<br>Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 395. Springer Cham, 2021.<br>Print ISBN 978-3-030-90015-1; Online ISBN 978-3-030-90016-8. Series Print ISSN 1867-8211. Series Online ISSN 1867-822X.<br><br>**About the Index**<br>Q4, SJR 2020: 0.142. SNIP: 0.187. Cite Score: 0.7.<br><br>https://www.scimagojr.com/journalsearch.php?q=21100220348&tip=sid<br>H Index: 44. | CEN | Book Chapter |
| 5 | Dr. Maaruf Ali | OSMËNI T., **ALI M.** (2021) LoRa IoT WSN for E-Agriculture. In: Miraz M.H., Southall G., Ali M., Ware A., Soomro S. (eds) Emerging Technologies in Computing. iCETiC 2021. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 395. Pp. 85-93. Springer, Cham.<br><br>First Online: 04 November 2021.<br><br>**Article Link**<br>https://doi.org/10.1007/978-3-030-90016-8_6<br><br>**About the Book**<br>Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 395. Springer Cham, 2021.<br>Print ISBN 978-3-030-90015-1; Online ISBN 978-3-030-90016-8. Series Print ISSN 1867-8211. Series Online ISSN 1867-822X.<br><br>**About the Index**<br>Q4, SJR 2020: 0.142. SNIP: 0.187. Cite Score: 0.7.<br><br>https://www.scimagojr.com/journalsearch.php?q=21100220348&tip=sid<br>H Index: 44. | CEN | Book Chapter |
| 6 | Dr. Maaruf Ali | MIRAZ, M.H., **ALI, M.**, AND EXCELL, P., "Adaptive User Interfaces and Universal Usability through Plasticity of User Interface Design", *Computer Science Review*, vol. 40, May 2021, 100363. | CEN | Article |

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| | | **Article Link**<br>https://www.sciencedirect.com/science/article/pii/S1574013721000034<br>https://doi.org/10.1016/j.cosrev.2021.100363.<br><br>**About this journal**<br>*Computer Science Review*. Elsevier<br>Q1 Journal. ISSN: 1574-0137.<br><br>**About the index**<br>https://www.scopus.com/sourceid/8000153138<br>Scopus Cite Score (2020): 14.6. Q1 ranked. SNIP: 5.672. SJR: 1.646.<br>5/226 in General Computer Science.<br>7/120 in Theoretical Computer Science.<br><br>Clarivate Analytics (2021): Impact Factor: 7.872; Eigenfactor: 0.001950.<br><br>https://www.scimagojr.com/journalsearch.php?q=8000153138&tip=sid&clean=0H<br>Index: 44 | | |
| 7 | Dr. Maaruf Ali | M. H. MIRAZ, **M. ALI**, P. S. EXCELL AND S. KHAN, "AI-based culture independent pervasive m-learning prototype using UI plasticity design", *Computers, Materials & Continua*, vol. 68, no.1, pp. 1021–1039, 22nd March 2021. Tech Science Press.<br><br>**Article Link**<br>https://www.techscience.com/cmc/v68n1/41814<br>https://doi.org/10.32604/cmc.2021.015405<br><br>**About this journal**<br>Tech Science Press. ISSN: 1546-2218 (print). ISSN: 1546-2226 (online).<br><br>**About the index**<br>SCI Impact Factor 2020: 3.772; Eigenfactor Score: 0.002260.<br><br>Scopus/SCImago 2020: CiteScore 4.6, SNIP 3.089, SJR 0.788 (Q1).<br>80% 56/290 Modelling and Simulation.<br><br>https://www.scimagojr.com/journalsearch.php?q=24364&tip=sid&clean=0<br>H Index = 40. | CEN | Article |
| 8 | Dr. Maaruf Ali | MIRAZ, M.H., EXCELL, P., AND **ALI, M.**, "Culturally Inclusive Adaptive User Interface (CIAUI) Framework: Exploration of Plasticity of User Interface Design", *Int. J. of Information Technology & Decision Making*, vol. 20, no. 10, pp. 199-224, 2021. Published: 19 January, 2021.<br><br>**Article Link**<br>https://doi.org/10.1142/S0219622020500455<br><br>**About this journal**<br>ISSN (print): 0219-6220 \| ISSN (online): 1793-6845, Published by World Scientific.<br><br>**About the index**<br>Impact Factor = 2.220 (Clarivate-Analytics, 2020); Eigenfactor: 0.001210.<br><br>Scopus Indexed: CiteScore = 4.0 (2020); SJR = 0.41 (2020); SNIP = 1.041 (2020).<br>Q1 Journal: 80% = 14/69<br>Computer Science (miscellaneous). | CEN | Article |

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| | | https://www.scimagojr.com/journalsearch.php?q=4700152646&tip=sid&clean=0<br>H Index = 42. | | |
| 9 | Assoc. Prof. Dr. Carlo Ciulla | Ciulla, C., 2021. Combined inverse Fourier transformation of magnetic resonance and intensity-curvature functional images. Engineering Reports, 3(2), p.e12290.<br><br>**Article link**<br>https://onlinelibrary.wiley.com/doi/full/10.1002/eng2.12290<br><br>**About this journal**<br>https://onlinelibrary.wiley.com/journal/25778196<br><br>**About the index**<br>https://onlinelibrary.wiley.com/page/journal/25778196/homepage/overview#A_I<br><br>https://mjl.clarivate.com/search-results<br>Search for: Engineering Reports<br>(*Emerging Sources Citation Index) | CEN | Article |
| 10 | Assoc. Prof. Dr. Carlo Ciulla | Ciulla, C., 2021. Inverse Fourier transformation of combined first order derivative and intensity-curvature functional of magnetic resonance angiography of the human brain. Computer Methods and Programs in Biomedicine, 211, p.106384.<br><br>**Article link**<br>https://www.sciencedirect.com/science/article/abs/pii/S0169260721004582<br><br>**About this journal**<br>https://www.sciencedirect.com/journal/computer-methods-and-programs-in-biomedicine<br>CiteScore 7.7<br>Impact Factor 5.428<br><br>**About the index**<br>https://mjl.clarivate.com/search-results<br><br>Search for: Computer Methods and Programs in Biomedicine | CEN | Article |
| 11 | M.Sc. Gent Imeraj | Uka, A., Ndreu Halili, A., Polisi, X., Topal, A., Imeraj, G. and Vrana, N., 2021. Basis of Image Analysis for Evaluating Cell Biomaterial InteractionUsing Brightfield Microscopy. Cells Tissues Organs, [online] 210(2), pp.77-104.<br><br>**Article link**<br>https://doi.org/10.1159/000512969<br><br>**About this journal**<br>https://www.karger.com/Journal/Home<br>/224197<br><br>**About the index** https://mjl.clarivate.com/search-results(Search *Cells Tissues Organs*) | CEN | Article |
| 12 | M.Sc. Xhoena Polisi | Uka, A., Halili, A. N., Polisi, X., Topal, A. O., Imeraj, G., & Vrana, N. E. (2021). Basis of image analysis for evaluating cell biomaterial interaction using brightfield microscopy. *Cells Tissues Organs*, *210*(2), 77-104.<br><br>**Article link**<br>https://www.karger.com/Article/Abstract/512969<br>https://doi.org/10.1159/000512969<br><br>**About this journal** | CEN | Article |

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| | | https://www.karger.com/Journal/Home/224197<br>**About the index**<br>https://www.karger.com/Journal/Home/224197<br>**Impact Factor 2.481** | | |

## Participation of Academic Staff in Academic Events

1. Participation of Dr. Julian Hoxha and Mr. Enea Mançellari in a training in the framework of the VTECH Erasmus + CBHE Project, held during October 27-29, 2020.
2. Participation of Dr. Arban Uka in an international conference in the framework of the PANBioRA Project, held during February 11-13, 2021.
3. Participation of Mr. Florenc Skuka and Mr, Enea Mançellari in an activity in the framework of the VTECH Project under Erasmus+ CBHE, held during May 20-21, 2021, in the Republic of North Macedonia
4. Participation of Dr. Arban Uka at the Training School, held during July 05-08, 2021, in Ancona, Italy.
5. Participation of Mr. Florenc Skuka, Mr. Albert Kopaçi, and Mr. Alban Xhepi, in the Summer School in the framework of the VTECH Project under Erasmus+ CBHE, held during July 05-09, 2021, in Prishtina Kosova.
6. Participation of Dr. Julian Hoxha at the Steering Committee Meeting in the framework of the DIMTV Project under Erasmus+ CBHE held during July 21-22, 2021, in Prishtina, Kosova.
7. Participation of Dr. Arban Uka and Dr. Albana Halili at the “Emerging Biomaterials and Cardiology and Neurology (NECABIO)”, held during July 27-29, 2021, in Prague, Czech Republic.
8. Participation of Dr. Arban Uka, Dr. Igli Hakrama, Dr. Shkëlqim Hajrulla, Mr. Enea Mançellari, Ms, Sabrina Begaj at a staff training in the famework of the DIMTV Project under Erasmus + CBHE held during September 01-03, 2021, in Ostrava, Czech Republic.
9. Participation of Dr. Arban Uka, Dr. Igli Hakrama, and Dr. Florenc Skuka in a Training Mobility held during September 20-24, 2021, at Bjelovar University of Applied Science in Croatia.

10. Participation of Dr. Julian Hoxha and Mr. Enea Mançellari at a staff training in the framework of the DIMTV Project under Erasmus + CBHE during September 23-24, 2021 at the University of “Aleksandër Moisiu”, Durrës.

# Projects

## PANBioRA Project

Computer Engineering Department is a partner at the PANBioRA project in the framework of the Horizon 2020 program financed by the EU.

The **"Personalised And/or Generalised Integrated Biomaterial Risk Assessment" (PANBioRA)** project is conducted under the Horizon 2020 topic titled "Development of a reliable methodology for better risk management of engineered biomaterials in Advanced Therapy Medicinal Products and/or Medical Devices". PANBioRA aims at providing a comprehensive solution for the time- and cost-effective risk assessment of: i) new biomaterials under health or disease states or ii) a given biomaterial for each patient in a personalized manner.

It will standardize the evaluation of biomaterials and open the venue for pre-implantation, personalized diagnostics for biomaterial-based applications.

PANBioRA will provide a modular platform to assess risks at different aspects and length scales. This comprises antibody response, cytotoxicity/genotoxicity at cell level, systemic and local effects at tissue and connected tissues (organ-on-a-chip) level. Moreover, physicochemical and biomechanical characterization as well as predictive modelling at systems level will complement the system. This will be achieved by connecting testing modules in a structure supported by web-based modelling and risk radar tools together with a biomechanical testing system.

PANBioRA will for the first time, predict the patient specific response to a given biomaterial before its implantation. This measure will allow for the selection of the best suitable material, minimizing side effects and improving health outcomes. It will also accelerate the process of validation of the biocompatibility of new devices by providing an automated, comprehensive

process for the parallel assessment of risks at different scales aiding new biomaterial discovery and commercialization.

Horizon 2020 projects belong to the most prestigious family of projects that can be funded by the European Commission. PANBioRA will start on January 01, 2018, and it will have a **duration of 48 months**. The department that is responsible for the completion of the respective tasks is Computer Engineering Department. The major tasks include: i) preparation of highly sensitive integrated circuits for the measurement of the response of biomaterials, ii) automated analysis of experimental data that will be extracted from images and videos employing the necessary software and hardware, and iii) integration of the developed technology into portable and user friendly devices. The consortium is composed of 17 different institutions from 11 European countries.

# E. Support, Resources & Representation

## List of Students' Internships

**BA CEN**

1. Alessia Toli – Shero Company
2. Amelia Agolli – Pragmatic Software
3. Andi Sula – Raiffeisen Bank
4. Arlin Ramasaço – Landmark Communication
5. Bjorn Rexhepi – ikubINFO Software Engineering
6. Denado Rabeli – Tirana Institute of Technology
7. Devid Duma – CardoAl
8. Elion Marku – UFT
9. Ergys Rrolli – Stylenet
10. Gersjan Nano – Softexpres
11. Glaud Godeni – Real Construction Group
12. Irv Lika – Bashkia Durres
13. Martina Kajana – Vodafone Albania

14. Raziena Uruçi – Media Union
15. Romario Braho – EPOKA University
16. Aniledio Lami - EPOKA University
17. Arjol Pançi – EPOKA University
18. Natanael Xhelilaj - EPOKA University
19. Dejvi Zelo – EPOKA University
20. Denada Rama – EPOKA University
21. Denisa Biçaku – EPOKA University
22. Elvis Ruçi – EPOKA University
23. Endri Seferi – EPOKA University
24. Erisa Kazaferi – EPOKA University
25. Evelin Uliu – EPOKA University
26. Fane Veizi – EPOKA University
27. Gled Muça – EPOKA University
28. Nikaela Balla – EPOKA University
29. Juxhin Allaisufi – EPOKA University
30. Redon Basha – EPOKA University
31. Kevin Kurtaja – EPOKA University
32. Kevin Çuedari – EPOKA University
33. Klejda Kumi – EPOKA University
34. Xhesika Biçaku – EPOKA University
35. Kristi Çuni – EPOKA University
36. Ledia Leka – EPOKA University
37. Levina Përzhilla – EPOKA University
38. Louis Alban Ziko – EPOKA University
39. Marilena Shkurti – EPOKA University

## Student Best Success Stories

### 1) Publication in International Journal of Student Project Reporting

We are proud to share the news that four students of our department: Genta Mirku, Nolla Sherifi, Sindi Dhima and Nikol Zaçe through the guidance of our professor Assoc. Prof. Dr. Carlo Ciulla have published their paper titled: " *Edge detection in two-dimensional images through model polynomial fitting and first order derivative* " in International Journal of Student Project Reporting.

This paper is the presentation of a methodology for edge detection. Image edges are found in the first order derivative (FOD) image. The FOD image is obtained re-sampling the departing image with model function. The model function is thus fitted pixel-by-pixel to the departing image. The re-sampling surface of the FOD image is calculated as the square root of the sum of the squares of the two partial first order derivatives of the model function. The FOD image is the edge finder image.

FOD (first order derivative) images: edge finder behavior of the model polynomial function on the rectangle image. Noticeably, when a = 0 horizontal edges are not found (see image labelled with(0, 1, 1). When b = 0 vertical edges are not found (see image labelled with (1, 0, 1). In all the other cases the 4 edges are well defined. Worth noting that when the value of c = 0 (see image labelled with (1, 1, 0)) the 4 edges are found because ‘a’ and ‘b’ are non-null. ‘a’, ‘b’ and ‘c’ are the three gradients of the model polynomial function.

### 2) Our student, Ms. Migena Ceyhan defended her PhD dissertation

On January 25, 2021, Ms. Migena Ceyhan, PhD student at the Department of Computer Engineering, Epoka University has successfully defended her PhD dissertation entitled "Analyzing Customer Reviews in Turkish Using Machine Learning and Data Science Methodologies".

The Jury of the PhD Defence was composed of Distinguished Professors in this field in Albania:

Prof. Dr. Betim Çiço

Prof. Dr. Neki Frashëri

Prof. Dr. Kozeta Sevrani

Assoc. Prof. Dr. Carlo Ciulla

Assoc. Prof. Edlira Martiri

We wish every success to Dr. Ceyhan in her future academic career and professional engagements.

### 3) Albanian Skills 2020

On 14 November 2020 at Tirana Business Park was conducted the 6th edition of the AlbanianSkills competitions. AlbanianSkills is an independent Albanian Swiss initiative that promotes skills and improves the recognition and status of vocational education and training in Albanian society.This event gathers many people from 16 to 26 years old and offers them the opportunity to compete in different fields such as Business Development, Graphic Design, software and web development, photography, etc. For many years students of EPOKA University have been participating in this event and this year they were announced as the winners of the specific field that they were competing in.

**Hysen Ndregjoni**, a student at EPOKA University in computer engineering study program - First place at software development.

**Arjan Marku**, a student at EPOKA University in computer engineering study program- Third place at software development.

**Klaidi Merdhoci**, a student at EPOKA University in Software Engineering study program - Sixth place at software development.

**Yusuf Bera Ermis**, a student at epoka University in the computer engineering study program- Second place in Photography.

**Hysen will represent Albania in EuropeanSkills 2021 in Graz, Austria.**

(https://euroskills2020.com/en/euroskills-2020-postponement-of-the-european-skills-championships-until-january-2021/)

We want to congratulate the AlbanianSkills for the great organization of the competition and wish our students every success.

## Office Holders

The department would like to first thank all the colleagues for their valuable contribution to teaching, research activities and other student related activities.
We would like to thank Mrs. Fjona TOPÇIU for her valuable contribution as department coordinator. Her hard work and patience were essential in fulfilling all the tasks for the support and management of two bachelor programs, three master programs and one PhD program.

## Acknowledgements

In addition to the Office Holders listed above, the department would like to thank the following for their collaboration to make this department offer all the facilities needed for the students.

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