



# Master of Science in INTELLIGENT CRITICAL INFRASTRUCTURE SYSTEMS



University of Cyprus  
Department of Electrical and  
Computer Engineering



Imperial College  
London

# Student Handbook

MSc in Intelligent Critical Infrastructure Systems

University of Cyprus – Department of Electrical and Computer Engineering

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# 1 WELCOME MESSAGE

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Dear Student,

It is with great pleasure that we welcome you at the MSc program in Intelligent Critical Infrastructure Systems.

The program is offered by the Department of Electrical and Computer Engineering of the University of Cyprus, in collaboration with the KIOS Research and Innovation Center of Excellence and Imperial College London.

The program is intensive and involves lectures, laboratories, coursework and finally a research thesis. Make sure your attendance is regular and that any coursework is submitted on time.

This handbook provides a quick and handy reference to information you may find useful. Please read this guide, and use it in the future as a reference. Some of the contents of this may change in the course of the year; an updated copy will always be available on the Program's web page at: <http://www.msccis.ucy.ac.cy/>

I wish you a rewarding and enjoyable year at the University of Cyprus.

Maria K. Michael

Program Coordinator  
Associate Professor  
Department of Electrical and Computer Engineering  
University of Cyprus

## 2 PROGRAM ADMINISTRATION

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**Maria K Michael**

Associate Professor  
MSc Program Academic Coordinator  
Department of Electrical and Computer Engineering  
University of Cyprus

Email: [mmichael@ucy.ac.cy](mailto:mmichael@ucy.ac.cy)



**Chrysostomos Nicopoulos**

Associate Professor  
Chair, Department of Electrical and Computer Engineering  
University of Cyprus

Email: [nicopoulos@ucy.ac.cy](mailto:nicopoulos@ucy.ac.cy)



**Lilia Georgiou**

Administration Staff

Lilia is your main contact point to answer your questions, supply your routine letters, and assist you in any other administrative matters.

Email: [lgeorg05@ucy.ac.cy](mailto:lgeorg05@ucy.ac.cy)

Tel: 22893460



**Antonis Antoniou**

IT Manager

Department of Electrical and Computer Engineering

Antonis is responsible for the computational and administrative infrastructure of the ECE Department. He can provide technical support on IT related matters.

Email: [antoniou.i.antonisspamucy.ac.cy](mailto:antoniou.i.antonisspamucy.ac.cy)

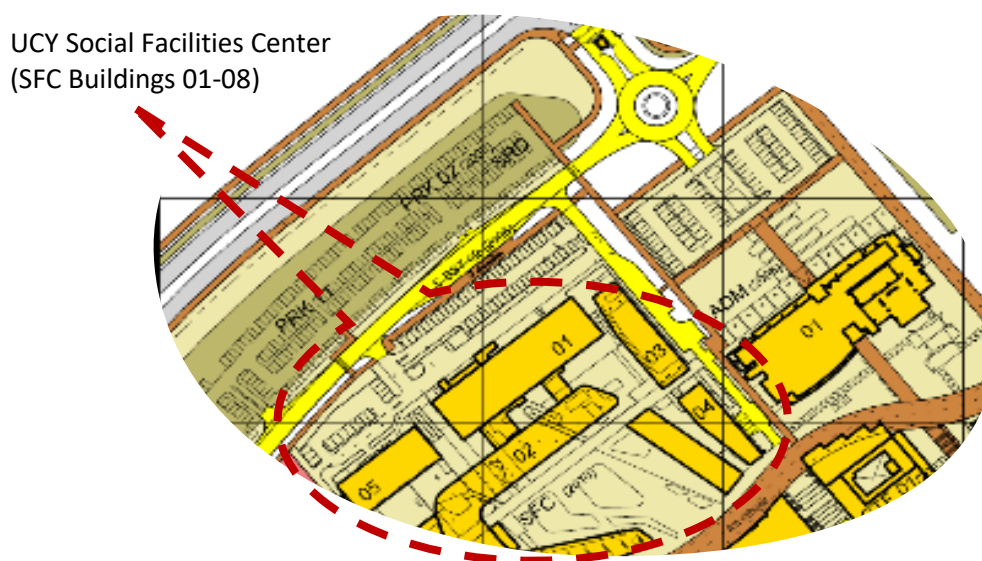
### 3 START OF TERM INFORMATION

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#### 1. Orientation session

An orientation session for new students of the MSc in Intelligent CIS will take place before the beginning of classes, between the **24 – 28 of August, 2020** (at UCY Main Campus, SFC Building 03, Room 105 – see map). You are encouraged to attend in order to meet your classmates, professors and staff of the program, get useful information regarding the program and be guided to the Campus and facilities supporting the program.

Students requiring a private meeting with the academic coordinator to further discuss any academic related matters regarding the MSc Program can do so after the end of the orientation session.



#### 2. Registration to courses

You are required to create an electronic account through the website <http://www.ucy.ac.cy/iss/en/register>.

All students enroll electronically in their courses using the BannerWeb system. The registration for Master students of this program for the academic year 2020/2021 is between 24 and 25 of August, 2020. Detailed information and instructions regarding registration will be sent to your email.

In the following link you can find useful guides on using the BannerWeb system, creating BannerWeb login information, and registering to courses:

<http://www.ucy.ac.cy/fmweb/en/organizational-structure/information-systems-office/8-en-articles/29-bannerweb-information>

For any further questions and clarifications regarding the use of the BannerWeb system, the students should contact the Graduate School at 22894044.

### 3. Program tuition fees

Tuition fees for the entire Program are set at €6,500 and should be paid as follows:

- €250 deposit upon offered a place in the program. This amount is paid in advance and it's not refundable.
- First semester: €1000 prior to registration and €1250 before the end of the exams period.
- Second semester: €1000 prior to registration and €1000 before the end of the exams period.
- Third semester: €1000 prior to registration and €1000 before the end of the exams period.

In addition, for the first semester, you are required to pay a €30 fee for the Student Medical Fund “Neophytos Handriotis”. This contribution is paid only electronically via the web address [www.ucy.ac.cy/epayments](http://www.ucy.ac.cy/epayments) . For the completion of the payment every student should have a user account at the University of Cyprus and a user account at JCC.

Tuition fees can be paid at the Bank of Cyprus:

Account No.: 0128-05-023773

IBAN: CY05 0020 0128 0000 0005 0237 7300

SWIFT: BCYPCY2N

Details: I.D. Number & Name of Student (Tuition Fees)

### 4. UCY student card

For the issuance of the UCY student card the students should apply online through the link <http://ucy.ac.cy/ucycard>. You should carry the card with you at all times: it serves as a security pass and a library card, as well as giving you access to the Sports Centre and student facilities. For more information please visit <https://www.ucy.ac.cy/expressservices/en/news-and-announcements>.

### 5. UCY email

For every member of the University's community, the University offers a personal electronic mail box and email address, as well as calendar services, contacts, tasks and e-briefcase services, all with sharing capabilities. These services are made available to the community either via the web tool at <https://portal.ucy.ac.cy/EN/Pages/Home.aspx> or via locally installed applications on the users' personal computers.

## 4 LOCATION AND FACILITIES

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The University of Cyprus is currently housed at the newly established University Main Campus (Panepistimiou Avenue, Aglantzia), at the Old Campus known as former Pedagogical Academy of Cyprus (Kallipoleos Avenue, Aglantzia), and in other owned or rented buildings.

For the MSc program in Intelligent Critical Infrastructure Systems, you will only require to visit the University Main Campus in Panepistimiou Avenue. The basic infrastructure/buildings you will need to visit are the following:

- **KIOS Center of Excellence** facilities housed in the Social Facilities Center (SFC) Building. Here you will find the administration of the MSc program (SFC 02), the teaching rooms (SFC 03) where classes will take place, academic personnel offices, meeting rooms, and the KIOS research laboratories (all in SFC 02-03).
- **Common Teaching Facilities Buildings 1&2** where additional lectures or other events may take place.
- **University House “Anastasios G. Leventis”**, which houses the Management and most of the Administrative Services of the University including the Graduate School, the Student Welfare Services and the International Support Office.
- **Learning Resource Center – Library “Stelios Ioannou”** where you can use the study space or access print, digital and audiovisual material. The print and digital material is searchable through the online catalogue via the library website: <http://library.ucy.ac.cy/en>

You can find maps and information for other buildings located in the UCY Campus in the link: <http://www.ucy.ac.cy/techsrv/en/building-facilities/university-campus>

## 5 ACADEMIC CALENDAR 2020/2021

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The Program's academic calendar for the **Fall 2020** Semester is shown in the table below:

<b>Registration</b>	24 <sup>th</sup> – 25 <sup>th</sup> August 2020
<b>Classes Begin</b>	31 <sup>st</sup> August 2020
<b>ECE 801 – Monitoring and Estimation</b>	31 <sup>st</sup> August – 23 <sup>rd</sup> October 2020
<b>ECE 802 – Optimization of CIS</b>	
<b>ECE 803 – Security for CIS</b>	26 <sup>th</sup> October – 23 <sup>rd</sup> December 2020
<b>ECE 807 – CIS Applications I</b>	
<b>Christmas Holidays</b>	24 <sup>th</sup> December 2020 – 17 <sup>th</sup> January 2021

*Public holidays: 1st October, 28th October, 6th January*

The Program's academic calendar for the **Spring 2021** Semester is shown in the table below:

<b>Registration</b>	13 <sup>th</sup> – 14 <sup>th</sup> January 2021
<b>Classes Begin</b>	19 <sup>th</sup> January 2021
<b>ECE 804 – Industrial Control</b>	19 <sup>th</sup> January – 12 <sup>th</sup> March 2021
<b>ECE 806 – Innovation and Entrepreneurship</b>	
<b>ECE 805 – Machine Learning</b>	16 <sup>th</sup> March – 28 <sup>th</sup> May 2021
<b>ECE 808 – CIS Applications II</b>	
<b>Easter Holidays</b>	26 <sup>th</sup> April – 07 <sup>th</sup> May 2021

*Public holidays: 15th March, 25th March, 1st April, 1st May.*

## 6 TIMETABLE

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The timetable of lecture courses is managed by the MSc program and is subject to minor changes, especially at the beginning of the terms. You can find the timetable for the **Fall and Spring Semester 2020-2021** in the next page. It is a good idea to check the timetable frequently through the link below to get information on any updates: <http://www.msccis.ucy.ac.cy/study-program/course-schedule/>

Teaching Schedule 2020-2021 - Fall Semester

Week #	Week Period	ECE 801 - Monitoring and Estimation (C. Panayiotou) Lecture Day (hours)	Tutorials	ECE 802 - Optimization of CIS (A. Astolfi) Lecture Day (hours)	Tutorials	ECE 803 - Security for CIS (C. Hankin) Lecture Day (hours)	Tutorials	ECE 807 - Applications I (G. Ellinas) Lecture Day (hours)	Tutorials	
Week 1	31/08-04/09	Tue & Thu (6:30 pm)	Fri (5-7 pm)	Tue & Thu (4:30-6 pm)	Fri (7-9 pm)					
Week 2	07/09-11/09	Tue & Thu (6:30 pm)	Fri (5-7 pm)	Tue & Thu (4:30-6 pm)	Fri (7-9 pm)					
Week 3	14/09-18/09	Tue & Thu (6:30 pm)	Fri (5-7 pm)	Tue & Thu (4:30-6 pm)	Fri (7-9 pm)					
Week 4	21/09-25/09	Tue & Thu (6:30 pm)	Fri (5-7 pm)	Tue & Thu (4:30-6 pm)	Fri (7-9 pm)					
Week 5	28/09-02/10	Tue (6-8 pm)	Fri (5-7 pm)	Tue (4-6 pm)	Fri (7-9 pm)					
Week 6	05/10-09/10	Tue & Thu (6:30 pm)	Fri (5-7 pm)	Tue & Thu (4:30-6 pm)	Fri (7-9 pm)					
Week 7	12/10-16/10	Tue & Thu (6:30 pm)	Fri (5-7 pm)	Tue & Thu (4:30-6 pm)	Fri (7-9 pm)					
Week 8	19/10-23/10	<i>Final Exam Week</i>								
Week 9	26/10-30/10					Tue & Thu (3-5 pm)	Fri (5-7 pm)	Tue & Thu (5-7 pm)	Fri (7-9 pm)	
Week 10	02/11-06/11					Tue & Thu (3-5 pm)	Fri (5-7 pm)	Tue & Thu (5-7 pm)	Fri (7-9 pm)	
Week 11	09/11-13/11					Tue & Thu (3-5 pm)	Fri (5-7 pm)	Tue & Thu (5-7 pm)	Fri (7-9 pm)	
Week 12	16/11-20/11					Tue & Thu (3-5 pm)	Fri (5-7 pm)	Tue & Thu (5-7 pm)	Fri (7-9 pm)	
Week 13	23/11-27/11					Tue & Thu (3-5 pm)	Fri (5-7 pm)	Tue & Thu (5-7 pm)	Fri (7-9 pm)	
Week 14	30/11-04/12					Tue & Thu (3-5 pm)	Fri (5-7 pm)	Tue & Thu (5-7 pm)	Fri (7-9 pm)	
Week 15	07/12-11/12					Tue & Thu (3-5 pm)	Fri (5-7 pm)	Tue & Thu (5-7 pm)	Fri (7-9 pm)	
Week 16	14/12-18/12							Tue (5-7 pm) & Thu (5-7:30 pm)	Fri (7-9 pm)	
Week 17	21/12-25/12					<i>Final Exam Week</i>				

Teaching Schedule 2020-2021 - Spring Semester

Week #	Week Period	ECE 804 - Industrial Control (T. Parisiri) Lecture Day (hours)	Tutorials	ECE 806 - Innovation and Entrepreneurship (M. Makri) Lecture Day (hours)	Tutorials	ECE 805 - Machine Learning (M. Polycarpou) Lecture Day (hours)	Tutorials	ECE 808 - Applications II (G. Ellinas) Lecture Day (hours)	Tutorials	
Week 1	18/01-22/01	Tue & Thu (6:30 pm)	Fri (4-6 pm)	Tue & Thu (4:30-6 pm)						
Week 2	25/01-29/01	Tue & Thu (6:30 pm)	Fri (4-6 pm)	Tue & Thu (4:30-6 pm)						
Week 3	01/02-05/02	Tue & Thu (6:30 pm)	Fri (4-6 pm)	Tue & Thu (4:30-6 pm)						
Week 4	08/02-12/02	Tue & Thu (6:30 pm)	Fri (4-6 pm)	Tue & Thu (4:30-6 pm)						
Week 5	15/02-19/02	Tue & Thu (6:30 pm)	Fri (4-6 pm)	Tue & Thu (4:30-6 pm)						
Week 6	22/02-26/02	Tue & Thu (6:30 pm)	Fri (4-6 pm)	Tue & Thu (4:30-6 pm)						
Week 7	01/03-05/03	Tue & Thu (6:30 pm)	Fri (4-6 pm)	Tue & Thu (4:30-6 pm)						
Week 8	08/03-12/03	<i>Final Exam Week</i>								
Week 9	15/03-19/03					Tue & Thu (3-4:30 pm)	Fri (4-6 pm)	Tue & Thu (5-7 pm)	Wed (4-6 pm)	
Week 10	22/03-26/03					Tue & Wed (3-4:30 pm)	Fri (4-6 pm)	Tue & Thu (5-7 pm)	Mon (4-6 pm)	
Week 11	29/03-02/04					Tue & Wed (3-4:30 pm)	Fri (4-6 pm)	Tue & Wed (5-7 pm)	Mon (4-6 pm)	
Week 12	05/04-09/04					Tue & Thu (3-4:30 pm)	Fri (4-6 pm)	Tue & Thu (5-7 pm)	Mon (4-6 pm)	
Week 13	12/04-16/04					Tue & Thu (3-4:30 pm)	Fri (4-6 pm)	Tue & Thu (5-7 pm)	Mon (4-6 pm)	
Week 14	19/04-23/04					Tue & Thu (3-4:30 pm)	Fri (4-6 pm)	Tue & Thu (5-7 pm)	Mon (4-6 pm)	
Week 15-16	26/04-07/05	<i>Easter Holidays</i>								
Week 17	10/05/14/05					Tue & Thu (3-4:30 pm)	Fri (4-6 pm)	Tue & Thu (5-7 pm)	Mon (4-6 pm)	
Week 18	17/05-21/05							Tue (5-7 pm) & Thu (5-7:30 pm)	Mon (4-6 pm)	
Week 19	24/05-28/05					<i>Final Exam Week</i>				



## 7 AWARD OF THE MSc

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To be awarded the MSc in Intelligent Critical Infrastructure Systems you need to achieve a passing grade to all components of the program which are listed below. The structure per semester shown is for full-time students starting the program in Fall Semester 2020. Students wishing to study on a part-time mode, they can consult the Program Academic Coordinator and discuss the order of course selection and related matters.

	ECTS	Instructor
<b>Fall Semester 2020</b>		
<b>ECE 801 – Monitoring and Estimation</b>	7	Christos Panayiotou
<b>ECE 802 – Optimization of CIS</b>	7	Alessandro Astolfi
<b>ECE 803 – Security for CIS</b>	7	Chris Hankin
<b>ECE 807 – CIS Applications I (Fundamentals)</b>	9	George Ellinas
<b>Spring Semester 2021</b>		
<b>ECE 804 – Industrial Control</b>	7	Thomas Parisini
<b>ECE 805 – Machine Learning</b>	7	Marios Polycarpou
<b>ECE 806 – Innovation and Entrepreneurship</b>	7	Marianna Makri
<b>ECE 808 – CIS Applications II (Advanced)</b>	9	George Ellinas
<b>Fall Semester 2021</b>		
<b>ECE 809/810 – MSc Thesis</b>	30	Coordinator: Maria K. Michael
<b>Entire Duration of Program</b>		
<b>ECE 811 – MSc Seminars &amp; Workshop</b>	2	Coordinator: Maria K. Michael

### Grading System

The grading system is numerical and ranges from 0 to 10, with increments of 0.5. The minimum passing grade is 5.0. The Grade Point Average (GPA) is calculated on the basis of the average grades for all courses.

## 8 MSc THESIS

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The program includes a final-year project (MSc thesis) on a research topic. Projects are allocated at the end of February of the 1st year of study (student proposals for projects may also be allowed, after examination and approval by the Department's Graduate Studies Committee). Projects can be carried out in collaboration with the industry, tackling specific research challenges faced by the industry. For industrial projects, the specific project and student(s) involved are approved mutually by the project supervisor(s) and the specific company/organization.

### Student Advising

**Academic Advisor:** Every student is assigned, upon admission into the program, an Academic Advisor who is faculty member of the ECE department. The Academic Advisor, assigned by the Graduate Studies Committee during the admission evaluation process, monitors the progress of the student and consults with the student on his/her academic plans.

**Research Supervisor:** By the end of the second semester, every student finds a Research Supervisor. The Research Supervisor will be responsible for overseeing the work conducted by

the student with regards to the final-year project. Possible Research Supervisors are members of the Program's Teaching Personnel, found at <http://www.msccis.ucy.ac.cy/cost/teaching-personnel/>.

### Thesis Committee

The Thesis Committee will consist of the student's Research Supervisor and two additional faculty members with related research interests. One of the members of the Committee can be a qualified individual who is external to the Department. The student's Research Supervisor will be the chairperson and coordinator of the Committee.

### Thesis Proposal

Students are expected to submit a written initial report by the end of the 2nd semester (Spring). The initial report covers the background, specification and milestones for the project, providing the aims and objectives of the project, a literature review and a contents page for the final report.

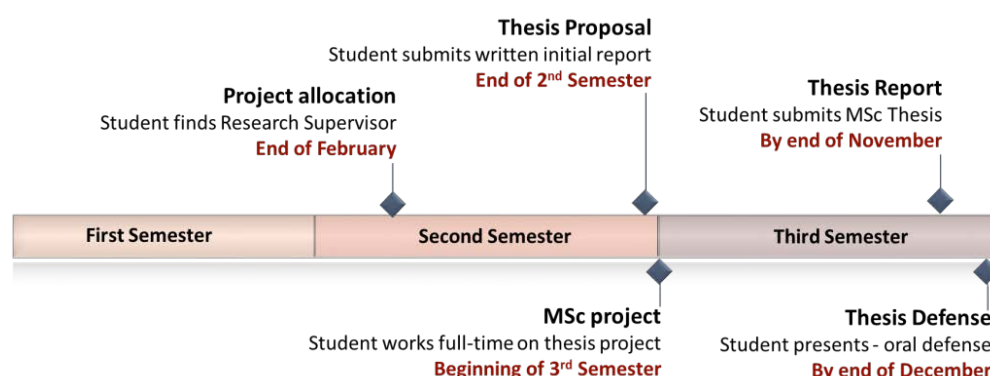
### Thesis Report

Students start full time work on their project after the end of exams in May. The student presents a written project report to the MSc Thesis Committee at least by the end of November of the 3rd semester of the program. The report has to be in a generally accepted format and must contain a description of the proposed research, obtained results, and a complete bibliography which includes the current state of art.

### Defense of the MSc Thesis

The student presents the scientific research findings of his/her MSc Thesis during an oral defense, which takes place before the MSc Thesis Committee (usually during December) and is open to the public. The procedure for the defense is comprised of three stages:

- An oral presentation of the thesis in an open lecture lasting 30-45 minutes, with additional time available for questions from the public.
- A closed discussion between the student and the members of the MSc Thesis Committee.
- Meeting of the MSc Thesis Committee to make its final deliberation.



After completion of the defense, the MSc Thesis Committee submits a written substantiated proposal, including the earned grade (which must be either Excellent, Very Good, Good, or Unsatisfactory) and, when appropriate, suggestions to the student, to the ECE Graduate Studies Committee. The Graduate Studies Committee must make the recommendation to the Department Council which approves the recommendation. In the case of rejection (Unsatisfactory grade), the candidate is entitled to ask for a repetition of the defense procedures

for at most one more time. The terms of resubmission of the project are set out in writing by the MSc Thesis Committee. If the defense is satisfactory, the MSc Thesis Committee signs the thesis and submits to the department two original copies, one for the department records and one for the University Library. An electronic version of the thesis in PDF format must also be submitted for the Department records and for dissemination.

## 9 SEMINARS AND WORKSHOP

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The seminars explore current research and topical issues in the areas of monitoring, control, management, and security of CIS, as well as other related electrical and computer engineering disciplines, focused on the general theme of innovation.

### **Announcement**

Seminars are organized on a regular basis. Students are notified about upcoming seminars and other events that can count towards their seminars' course (such as the KIOS Distinguished Lecture Series and the KIOS Graduate Summer School).

### **Register to the course**

You can participate in the seminars from the first semester of your studies but you should register to the ECE 811 – MSc Seminars and Workshop course in the semester you expect to fulfill the requirements described below.

### **Requirements**

1. Seminar presentations: You are required to participate in at least 15 presentations over the course of the MSc program, 5 of which can be in a non-technical subject (you will be able to check this in the announcement of the seminar). When attending a seminar, you should sign the attendance list provided to register your participation and be counted towards the requirement of 15 presentations.
2. Workshop participation: In your final semester, you are expected to participate in a dedicated workshop, organized at the University of Cyprus, which will be exploring specific research and innovation topics related to the MSc program. During the workshop, you are required to showcase your work for your MSc thesis, attend the presentations by other fellow MSc students, and have the opportunity to discuss your research work and exchange ideas with other students and faculty.

## 10 COURSE DESCRIPTIONS

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Separate webpages per course are provided at the main program's webpage. Full description of each course, assessment method(s), bibliography and teaching methodology are included in the course syllabus given to students during the first lecture of the course and is also available on the course's dedicated webpage. Below is the list of courses and their short description for the academic year 2019/2020.

### **ECE 801 – Monitoring and Estimation**

***Instructor: Professor Christos Panayiotou, University of Cyprus***

The purpose of this course is to familiarize the students with some of the main techniques for estimating the state of a dynamical system and use the state of estimation to detect faults in some of the system's components such as sensor faults and water leaks. Examples will be derived from critical infrastructure systems: power and energy systems, transportation systems and water networks. The students will learn to design and implement (in MATLAB) state estimators and fault detection algorithms for various systems, as well as to model faulty components.

### **ECE 802 – Optimization of CIS**

***Instructor: Professor Alessandro Astolfi, Imperial College London***

This course introduces finite-dimensional optimization and decision theory and basic optimization algorithms. The formulation of optimization problems arising in CISs is also presented together with worked out examples. After the course the students will be able to formulate optimization problems, design computer algorithms for finding minima and maxima in a wide range of optimization problems involving smooth criteria and, just as importantly, to interpret, and if necessary modify, the algorithms found in standard computer packages. The students will also be able to formulate and solve decision making problems and problems involving graphs. Finally, the students will be capable of formulating optimization problems arising in CISs and to compute their solutions.

### **ECE 803 – Security for CIS**

***Instructor: Professor Chris Hankin, Imperial College London***

The aim of the course is to cover the underlying principles and techniques used in securing CIS and to give examples of how they are applied in practice. At the end of the course, the students will have an understanding of the themes and challenges of CIS security and the current state of the art, they will have developed a critical approach to the analysis of CIS security and will be able to bring this approach to bear on future decisions regarding security. Finally students will be able to appreciate the main threats, attack techniques and defenses relevant to the security of CIS, to identify potential vulnerabilities and propose countermeasures and to design secure CIS.

### **ECE 804 - Industrial Control**

*Instructor: Professor Thomas Parisini, Imperial College London*

The aim of the course is to provide advanced elements of industrial control systems with emphasis on controlling generic large-scale systems related to critical infrastructures. Theory of multi-variable control is given with emphasis on optimal and model-predictive control approaches, as well as insight on the basic architectures of modern multi-level software automation architectures. The automation SW architectures and technologies are put in the context of CIS use cases where appropriate. The students, at the end of the course, should know the basic principles governing the analysis and design of multivariable control systems in the context of large-scale systems. They should be able to carry out the static and dynamic analysis characterization of models to be used in the design of multi-variable control systems. Moreover, they should be able to evaluate, among several options, how to configure and design the architecture and the controller of a multi-variable automatic control system starting from requirements and considering technological constraints.

### **ECE 805 – Machine Learning**

*Instructor: Professor Marios Polycarpou, University of Cyprus*

This course aims to introduce the theory, methods and applications of the field of Machine Learning. The objectives of the course are the presentation of the core principles and algorithms of supervised, unsupervised and reinforcement learning, the explanation of the application of these algorithms for the solution of regression, classification, clustering and decision-making problems and the demonstration of practical machine learning tools suitable for the analysis of data sets and the solution of machine learning problems. Special emphasis will be placed on real-world critical infrastructure systems applications. By the end of the course, students should be able to understand the principles of supervised, unsupervised and reinforcement learning, to design and implement a wide variety of machine learning algorithms, to analyze raw data to create representations that are more suitable for machine learning algorithms and to solve and evaluate the performance of classification, regression, dimensionality reduction and clustering problems that arise in critical infrastructure systems using state-of-the-art machine learning tools.

### **ECE 806 – Innovation and Entrepreneurship**

*Instructor: Associate Professor Marianna Makri, University of Cyprus*

The purpose of this course is to explore the many dimensions of new venture creation and growth. While most examples will be drawn from new venture formation, the course examines cases in ICT-related entrepreneurship, as well as social and non-profit entrepreneurship. The course also focuses on the challenges involved in attempting to profit from both incremental routine information and more radical revolutionary changes in products and processes. It highlights the importance of innovation to new ventures as well as established firms, and explores the organizational, economic and strategic problems that need to be tackled in order to ensure innovation as a long-term source of competitive advantage. This course will give students a thorough knowledge of where innovation can be found within the organization, how to recognize it, and how it can be used for competitive advantage. Moreover, will provide students an understanding of how they, as future leaders of innovative organizations, can recognize and harness creativity.

### **ECE 807 – CIS Applications I (Fundamentals)**

***Instructor: Professor Georgios Ellinas, University of Cyprus***

This course provides a solid understanding on the fundamentals of the following critical infrastructure systems: electric power systems, telecommunication networks, water distribution networks, and transportation networks. To understand how to model and simulate simple instances of these networks. It introduces general tools for modeling such systems (automata, Petri-nets, graph theory, conservation laws, differential and algebraic equations, partial differential equations) and general tools for simulating and analyzing such systems (discrete event simulation, steady-state methods, state-space, design of algorithms).

By the end of the course students will obtain the fundamentals skills required to model the most important critical infrastructure system components and the systems as a whole for the following infrastructures: electric power systems, telecommunication networks, water distribution networks, and transportation networks. They will also be able to simulate simple cases for these systems under steady state and faulty conditions.

### **ECE 808 – CIS Applications II (Advanced)**

***Instructor: Professor George Ellinas, University of Cyprus***

This purpose of this course is to provide a solid understanding of the following critical infrastructure systems: electric power systems, telecommunication networks, water distribution networks, and transportation networks. To model and analyze these systems using advanced network simulators. To understand the practical problems in their control, and management, and to obtain practical skills related to the design and operation of these systems under normal and faulty conditions. The students are expected to be able to model the most important critical infrastructure system components and be able to analyze them under steady state conditions. Moreover, they should be able to design and simulate these systems according to given operational criteria and constraints. Finally, students should understand the technical, economic, and environmental implications of the design and operation of critical infrastructure systems.

### **ECE 809/810 – MSc Thesis for Intelligent CIS I & II**

***Coordinator: Associate Professor Maria K. Michael, University of Cyprus***

The MSc thesis is a final-year project which enables students to carry out research in order to deepen their scientific and applied knowledge and skills in a specific topic in the area of Intelligent Critical Infrastructure Systems (CIS). Through their research students will understand technical and management features in Intelligent CIS, learn to deal with particular challenges in Intelligent CIS and obtain experience in research methods, including technical writing and communication skills, as well as project management.

### **ECE 811 – MSc Seminars & Workshop**

***Coordinator: Associate Professor Maria K. Michael, University of Cyprus***

Seminars exploring current research and topical issues in the areas of monitoring, control, management, and security of CIS, as well as other related electrical and computer engineering disciplines, focused on the general theme of innovation. Seminars are organized in blocks with related content, and are presented by prominent outside speakers as well as by faculty members and graduate students. The course requires participation in at least 15 seminar presentations over the

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**course of the MSc program. Students must attend at least 5 non-technical seminar presentations. Students are also expected to participate in a dedicated workshop, organized at the University of Cyprus, which will be exploring specific research and innovation topics related to their MSc program. The workshop will include prominent speakers from the academia and industry. During the workshop, students will also be required to showcase their work for their MSc thesis, attend the presentations by other fellow MSc students, and discuss their research work and exchange ideas with other students and faculty.**

## 11 POLICIES AND PROCEDURES

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### **UCY Postgraduate Studies Rules and Regulations**

The M.Sc. program conforms to all general rules and regulations for postgraduate studies at the University of Cyprus, as given in the following document:

[http://www.ucy.ac.cy/graduateschool/documents/Kanones/RULES\\_METAPTIXIAKIS\\_FOITISIS\\_ENGLISH.pdf](http://www.ucy.ac.cy/graduateschool/documents/Kanones/RULES_METAPTIXIAKIS_FOITISIS_ENGLISH.pdf)

### **Plagiarism**

According to the University's rules, any form of plagiarism is considered a serious offence and penalties are imposed accordingly. All rules and procedures for disciplinary offences are outlined in Section III of the UCY's Postgraduate Studies Rules:

[http://www.ucy.ac.cy/graduateschool/documents/Kanones/RULES\\_METAPTIXIAKIS\\_FOITISIS\\_ENGLISH.pdf](http://www.ucy.ac.cy/graduateschool/documents/Kanones/RULES_METAPTIXIAKIS_FOITISIS_ENGLISH.pdf)

### **Intellectual Property Rights Policy**

The University of Cyprus, acknowledging the need for a clear policy regarding IP rights and ownership, has established the Intellectual Property Policy. The policy is based on the principles that govern the ownership rights emanating from research of and/or materials produced by the University's members of staff, employees of affiliated institutions, centers and organizations as well as students of the University. According to the policy, the University claims ownership of all intellectual property made or created by student members in the course of or incidentally to their studies. This applies to all work produced by students as part of the program's projects and the M.Sc. Thesis. The policy is available via the following link:

[https://www.ucy.ac.cy/research/documents/Research/patents/IPR\\_Policy\\_UCY.pdf](https://www.ucy.ac.cy/research/documents/Research/patents/IPR_Policy_UCY.pdf)

### **Attendance and Absence**

Students are required to attend courses regularly. The Program's administration has to be informed, preferably by email to [mccis@ucy.ac.cy](mailto:mccis@ucy.ac.cy), if an extended absence is foreseen.

Students may apply for Temporary Interruption of studies during the semester when there are serious medical reasons. The student applies to the ECE Department, with notification to the Graduate School for approval. Studies may be interrupted for up to 2 semesters and there are not counted as part of the allowable time to complete the degree.

## 12 HEALTH AND SAFETY

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The UCY Office for Safety, Health and the Environment' goal is to promote the safety and health of people working at the University and other persons (e.g., students, visitors) who may be affected by the activities carried out.

- A Health Center operates at the University of Cyprus Campus for the purpose of providing healthcare to all members of the community. The Health Center and First Aid Services is located at the main Campus, Social Facilities Building 6. Contact number: 22-895270.
- The following KIOS staff members have been trained and received the first aid certification and can be contacted in case of any health emergency incident: Eliades Demetris, Loizidou Kosmia, Menelaou Charalambos, Petrou Despina, Photiou Christos, Polykarpou Elena, and Touloupos Giorgos. Relative announcements, with contact numbers are visible at several areas of the Center.
- In case of medical emergencies there is a defibrillator at the KIOS main building SFC 02, by the door leading to the bridge. The above first aiders have been trained to use it.
- Six first aid boxes are available at the following locations: main KIOS area (libraries), room 101, kitchen and lab.
- Emergency contact numbers can be found at this link: <http://ucy.ac.cy/hr/el/office-of-safety-healthand-environment/22-gr-articles/office-of-safety-health-and-environment/127-emergency-numbers>

## 13 SUPPORT SERVICES

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### **Counseling Services**

The University of Cyprus provides free of charge psychological support and counselling services for all its students through the UCY Mental Health Centre (tel.: +357 22894053, email: [counseling@ucy.ac.cy](mailto:counseling@ucy.ac.cy)). The primary aim of the Centre is to contribute to the wellbeing of students, so as to enable them to maximize their experience during the course of their studies and after.

Services are offered through individual or group psychotherapy and counselling sessions. Common concerns among students visiting the Centre include anxiety, stress, relationships, mood swings, problems that have to do with their academic life (difficulties in adjusting to their new way of life, etc.), a loss of a beloved person, as well as personal or career decisions that need to be made.

The Centre also organizes presentations and workshops on issues related to the students' psychological wellbeing. Additionally, it launches prevention and sensitization campaigns on topics related to psychological health and well-being, in collaboration with student and youth Support for disabled students Support for international students Careers Service Library and IT groups, as well as stakeholders and organizations that function in the broader community. Periodically, it publishes and disseminates relevant informative material in print or through its website.



### **Students with Disabilities**

Students with disabilities are treated as equals to all other students, whilst every effort is made to offer practical solutions to their problems, through student access services and/or academic accommodations. Students with disabilities should contact the Social Support Office of Academic Affairs and Student Welfare Service (AASWS) (tel.: +357 22894051/4052, email: [fm@ucy.ac.cy](mailto:fm@ucy.ac.cy)).

### **Careers Office**

The Careers Office of AASWS (tel.: +357 22894057, email: [careers@ucy.ac.cy](mailto:careers@ucy.ac.cy)) aims to be the link between the UCY students and the labor market. It informs both students and graduates of the University of Cyprus for job vacancies available, both on and off campus, through its online career system. The connection with the labor market is enhanced through the organization of various events like the annual Career Fair, the On Campus Recruitment Week, company presentations, open days, public discussions on current issues, networking events with potential employers and more.

The Careers Office aims at empowering the employability of the students and graduates. It organizes training seminars and workshops for business and personal skills development such as “Preparing the CV and the Cover Letter”, “Personal Statement Preparation”, “Improving Communication Skills”, etc. At the same time, it provides one to-one guidance for CV writing, interview and job hunting techniques, as well as other career related issues.

Last but not least, the Careers Office offers information and guidance on postgraduate studies abroad, scholarships and funding sources. It also demonstrates ways of online searching via certain websites, informs students of contact details of universities worldwide and distributes written and online material that helps students make an informative decision.

### **International Support Office**

The International Support Office of the Academic Affairs and Student Welfare Service is the newest office at the University of Cyprus and it was established in October 2015. The Office (<http://www.ucy.ac.cy/internationalsupport>) provides:

1. information to the foreign students about and
2. support to all non-European student and staff seeking to immigration requirement and visa issues e.g., entry visa, issuance and renewal of residence permits in Cyprus, medical examinations, etc.

## **14 FEEDBACK**

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The implementation of the curriculum is monitored by the Program Academic Coordinator and possible issues will be discussed and resolved by the Program’s Academic Board. Each student has the opportunity to provide feedback when submitting the course evaluation, upon completion of a course. All students are requested to complete the evaluation questionnaires for their courses via the BannerWeb system. Students will gain access to their grades the day after the questionnaires are completed.

For more information on Courses' Evaluation Questionnaires please see the link below:

<http://www.ucy.ac.cy/ctl/en/activities/for-students/evaluation-questionnaires>