



Bsc (Hons) in COMPUTER SCIENCE

In partnership with:



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1. WELCOME AND INTRODUCTION

WELCOME!

Dear Student,

This Handbook is intended to provide a concise reference and guide for all Anatolia American University ULE (AAU) students. Included herein are brief statements of the university's policies applicable to and of interest to all university constituencies.

This guide is intended to address some of the common academic and student life questions and concerns that are likely to arise during your years at AAU. Its purpose is not merely to lay out the policies of academic life, but also to point out ways of thinking about your education. Planning carefully and looking ahead will enable you to maximize your opportunities at the university. Knowing when and where to find guidance and counsel is important in ensuring that your educational choices are well-considered and make sense in the context of your larger academic goals.

We do assume, however, that you will seek out the help you need. This guide has been designed to help you do just that. Please read it, keep it, and use it as a reference throughout your academic career.

With best regards,

Dr. Stamos Karamouzis
AAU Provost

2. LIST OF PROGRAMME DIRECTOR AND ACADEMIC STAFF

INTERIM CHAIR

Dr. Vagelis Chatzistavros

Assistant Professor (Computer Science)

Dipl,Electrical and Computers Engineering, Democritus University of Thrace; MSc, Communication Network, Democritus University of Thrace; PhD, Electrical and Computers Engineering, Democritus University of Thrace

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ACADEMIC STAFF (ALPHABETICAL ORDER)

Dr. Astaras, Alexandros

Assistant Professor (Computer Science)

B.A. in Physics, Oberlin College, Oberlin, USA; PhD in Electronics Engineering, The University of Edinburgh, Edinburgh, Scotland, UK

Dr. Baglavas, Grigoris

Assistant Professor (Computer Science)

BSc, Mathematics, Aristotle University of Thessaloniki; MSc, Telematics, University of Sheffield; PhD, Computer Science, University of Macedonia

Mr. Christodoulou, Christos

Adjunct Instructor (Computer Science)

BSc., Physics, Aristotle University of Thessaloniki, Greece; MSc., Information Technology, University of Aston in Birmingham, Birmingham, U.K.

Dr. Daskalogiannis, Vasilios

Assistant Professor (Mathematics)

BS, Mathematics, Aristotle University of Thessaloniki, Greece; MSc in Pure Mathematics, Aristotle University of Thessaloniki, Greece; PhD, Mathematics, Department of Mathematics of the Aristotle University of Thessaloniki

Dr. Kanakoglou, Konstantinos

Assistant Professor (Mathematics - Physics)

B.Sc. in Physics, Aristotle University of Thessaloniki, Greece; M.Sc. in Pure Mathematics, Aristotle University of Thessaloniki, Greece; Ph.D. in Mathematical Physics, Aristotle University of Thessaloniki, Greece

Dr. Karamouzis, Stamos

Professor (Computer Science)

B.Sc. in Computer Science, Christopher Newport College, USA; M.Sc. in Computer Science, The College of William and Mary, USA; Ph.D. in Computer Science, The College of William and Mary, USA

Dr. Victoratos, Iosif

Adjunct Professor (Computer Science)

BS, MSC., Computer Engineering and Informatics, University of Patras, Greece; MSc., Informatics and Management, Aristotle University of Thessaloniki, Greece; Ph.D., Semantic Web Technologies, Aristotle University of Thessaloniki, Greece.

3. NAME, POSITION AND INSTITUTION OF THE EXTERNAL EXAMINER(S) INVOLVED IN THE PROGRAMME

- Dr. Antisthenis Tsompanas, University of the West of England
- Dr. Paul Neve, Kingston University London

4. INTRODUCTION TO THE PROGRAMME

Contemporary Information Technologies change rapidly in all levels of scope from hardware to conceptual. The AAU programme on Computer Science aims at offering its students a solid foundation that both addresses the fundamentals and provides adaptability in a lifelong career with continuous learning.

The AAU computer science graduate receives a solid and thorough education in fields of computing that interconnect as well as provide a deep and wide background in contemporary computer science. The programme is structured in threads, with some capstone modules unifying among them and a set of Mathematics modules providing necessary background knowledge for the contemporary computer scientist

The Programme aims to:

- Equip students with knowledge, skills and inspiration for a career at the forefront of innovation or further studies and research in computer science;
- Provide QAA standards level education in computer Science appropriate for either a career in industry or graduate studies. Such education shall cover a wide range of knowledge and understanding in all relevant areas of a rigorous curriculum and foster problem-solving skills and information literacy
- Develop cognitive skills needed by the computer scientist: the ability to model systems, the power of abstraction, the ability to communicate technical arguments
- Provide the ability to critically evaluate computer systems, their performance and their specifications and demonstrate a high-level of professional competence across a range of technical, legal and ethical areas.
- Instill professional and entrepreneurial attitudes in students and develop a range of transferable skills that would enable them to advance and exploit the knowledge and technical expertise in pursuing their further career
- Demonstrate the applicability of knowledge and skills in various contexts in which computer systems are developed, either when working alone or effectively participating as members of international teams

5. PROGRAMME SPECIFICATION

About the Programme

The mission of the School of Technology & Science is to offer innovative, leading edge technology programs in Computer Science and academically sound service modules in the areas of Mathematics, Statistics and Science. As Computer Science is a rapidly evolving discipline we continuously adapt our curriculum and facilities to meet the changing demands of the Computer Science profession.

The program targets:

- Students that are interested primarily in Computer Science

- Students or professionals that are interested to specialise in certain areas in computing. In particular the certificate and special programs provide training opportunities for the wider community.

Modules in the School of Technology & Science are designed to broaden students' perspectives on the role of computer science, mathematics, statistics and science in the modern world, while equipping them with programming, computer literacy and quantitative skills. A broad range of Computer Science modules is offered, the majority having a strong laboratory component with emphasis on application.

The duration of study at AAU leading to the award of the Undergraduate Diploma is set at a minimum of four (4) years, which includes the time required for the preparation and evaluation of the undergraduate thesis. Students have the option to enroll in a maximum of two (2) courses during the summer study period. Depending on their professional pathway and career interests, students may choose to do an internship through Practicum 300, an elective module at Level 6 (common for all programs)

The Computer Science curriculum consists of four course levels: Enhancement, Level 4, Level 5 and Level 6. To obtain the degree, students are required to complete 40 courses, including free electives. During the final three (3) academic terms, students may participate in the Internship Course (PRAC 300). The undergraduate thesis is completed during the final year of study. Bachelor of Science in Computer Science.

Programme goals and competencies

The Programme aims to:

- Equip students with knowledge, skills and inspiration for a career at the forefront of innovation or further studies and research in computer science
- Provide QAA standards level education in Computer Science, appropriate for either a career in industry or graduate studies. Such education will cover a wide range of knowledge and understanding in all relevant areas of a rigorous curriculum and foster problem-solving skills and information literacy
- Develop cognitive skills needed by the computer scientist: the ability to model systems, the power of abstraction, the ability to communicate technical arguments
- Provide the ability to critically evaluate computer systems, their performance and their specifications and demonstrate a high-level of professional competence across a range of technical, legal and ethical areas.
- Instill professional and entrepreneurial attitudes in students and develop a range of transferable skills that would enable them to advance and exploit the knowledge and technical expertise in pursuing their further career.
- Demonstrate the applicability of knowledge and skills in various contexts in which computer systems are developed, either when working alone or effectively participating as members of international teams

AAU Degree Competitive Advantage Areas

An AAU graduate with the BSc (Hons) in Computer Science will have obtained a theoretical and practical adequacy in the field of Computer Science application and design, some business domain knowledge and directly marketable skills through the ability to further obtain Professional Certifications (CCNA, ORACLE).

Graduates of the program will be able to pursue careers in the areas of

- Software Development
- Databases & Modeling
- Computing Systems and Networks
- Web & Mobile Applications
- Artificial Intelligence/Data Science

Special Features

The program does not concentrate only on the latest technologies, which at some point will become outdated, but provides students with excellent analytical skills and systematic thinking that will allow them to become lifelong learners and succeed in a wide variety of technical and managerial positions. Students are prepared for a successful career in the field of computing and its applications and/or additional study in computing or Business at the graduate level.

Computing and Teaching Facilities

- Modern computer facilities available to the students.
- All the necessary software for programing, multimedia, web-development and instruction is available in the labs for you to use.
- Students have access to printing and scanning devices.
- Spacious classrooms, equipped with a PC and projector. All classrooms are connected to a high-speed campus network and are connected to the internet.
- Students have abundant personal and secure server storage area, accessible from campus and home and are provided with email and Moodle accounts.
- Wi-Fi is available around the campus for laptop and mobile internet access.
- Hardware and software technical support is available and is of first-rate level

6. PROGRAMME OF STUDY AND INTENDED LEARNING OUTCOMES

Programme structure and learning outcomes

Enhancement modules

These modules ensure that students receive a well-rounded, skills-based education and may also include modules that enhance knowledge and skills in their subject area. Employers look for candidates who can analyze information, collaborate and adapt. The Enhancement modules equip students with highly desirable skills that maximize their learning experience and enhance both personal and professional growth, preparing them to navigate an ever-changing world. As part of their co-curricular studies, students, students are expected to master foundational skills that:

Develop Critical Skills

The Enhancement module build essential skills like critical thinking, communication, problem-solving, and analytical reasoning.

Encourage Interdisciplinary Thinking

By taking modules in sciences, humanities, and social sciences, students learn how different fields connect, making them more adaptable and innovative thinkers.

Boost Career Readiness

Employers look for well-rounded candidates who can analyze information, collaborate, and adapt—skills reinforced through general education modules.

Promote Lifelong Learning

These modules expose students to new subjects they might not have explored otherwise, helping them become more curious and engaged learners.

Indicative list (not limited to) of the enhancement modules, including free electives:

- English 101: Composition I
- Nutrition 130: Fundamentals of Human Nutrition
- Art 130: Introduction to Photography, from the analog to digital era
- Philosophy 203: Ethics

- Physics 120: Physics I
- Computer Science 360: Introduction to Data Science
- CSC 151: Quantitative Methods
- CSC 201: Business Data Management
- CSC 345: Introduction to Machine Learning and Deep Neural Networks

Programme Structure – Enhancement Modules

Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
MATH 101 – Elements of Finite Mathematics	15			N/A	Varies by students cohort entrance (Fall or Spring)
PHIL 101 - Introduction to Philosophy and Critical Reasoning	15				
ENG 102 - Composition II	15				
CSC 192 – Object Oriented Programming with Python	15				
POL 101 - Contemporary Politics	15				
ENG 204 - Business/Professional Communication	15				
PSY 101 - Introduction to Psychology	15				
HIS 120 - Contemporary Politics	15				

Learning Outcomes

3A. Knowledge and understanding

Learning outcomes:	Learning and teaching strategy/ assessment methods
Upon completion of the level, students will demonstrate: A1. An awareness of foundational concepts, key theories, and terminology in relevant subject areas (including mathematics, digital technologies, humanities, and social sciences). A2. An understanding of how people think, learn and behave, and how societies organize and govern themselves.	Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material. Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work. Tools to be used to achieve this will include some or all from the following: • printed and online teaching texts • directed readings from textbooks and papers

Programme Structure – Enhancement Modules

Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
		- Specialised software tools. Support of learning: Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor. Tools to be used to achieve this will include some or all from the following: - self-assessment questions and exercises, included in the teaching texts - programming tasks, computer-based investigations and open-ended project work - feedback and guidance from an instructor; tutorials, revisions and in-class activities - e-mail and individual instructor-learner conferences - Study and project guides. Assessment of learning: An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken. Tools to be used to achieve this will include some or all from the following: - Instructor-Marked summative formal examinations - Instructor-Marked summative projects - Instructor-Marked summative presentations - Instructor-Marked formative assignments/assessment - Instructor-Marked formative projects			

3B. Cognitive skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
Upon completion of the level, students will be able to: B1. Interpret information, data and arguments critically, drawing on both quantitative and qualitative reasoning. B2. Evaluate different perspectives, theories, or solutions and make informed judgements	Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material. Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work. Tools to be used to achieve this will include some or all from the following: • printed and online teaching texts • directed readings from textbooks and papers • Specialised software tools. Support of learning: Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor. Tools to be used to achieve this will include some or all from the following: • self-assessment questions and exercises, included in the teaching texts • programming tasks, computer-based investigations and open-ended project work • feedback and guidance from an instructor; tutorials, revisions and in-class activities • e-mail and individual instructor-learner conferences • Study and project guides. Assessment of learning: An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

3B. Cognitive skills

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3C. Practical and professional skills

Learning outcomes:

Upon completion of the level, students will demonstrate:

C1. skills to assess and use a basic set of digital tools (e.g., word processing, spreadsheets, research databases) for academic, research, or professional projects.

C2. skills to follow discipline-specific procedures (e.g., mathematical modeling, experimental methods, information retrieval) and apply them in practical contexts.

C3. an ability to produce well-organized, professional-quality communications (written, oral, visual)..

Learning and teaching strategy/ assessment methods

Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material.

Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work.

Tools to be used to achieve this will include some or all from the following:

- printed and online teaching texts
- directed readings from textbooks and papers
- Specialised software tools.

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work

3C. Practical and professional skills

- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3D. Key/transferable skills

Learning outcomes:

Upon completion of the level, students will be able to:

D1. Plan and review study plans while collaborating effectively in diverse teams, showing adaptability and interpersonal communication.

D2. Comprehend and communicate ideas clearly in both writing and speaking, tailoring language for academic, professional, and interdisciplinary audiences.

D3. Demonstrate an understanding of the role of professional bodies and lifelong learning strategies, self-reflection, and adaptability to new challenges.

Learning and teaching strategy/ assessment methods

Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material.

Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work.

Tools to be used to achieve this will include some or all from the following:

- printed and online teaching texts
- directed readings from textbooks and papers
- Specialised software tools.

3D. Key/transferable skills

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3. Programme structure and learning outcomes

(The structure for any part-time delivery should be presented separately in this section.)

Programme Structure - LEVEL 4

Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
CSC 105 - Structured Programming	15			N/A	Varies by students cohort entrance (Fall or Spring)
CSC 106 - Object Oriented Programming	15				
CSC 205 - Business Data Management	15				
CSC 215 - Data Structures	15				
CSC 230 - Systems Programming	15				
MATH 120 - Calculus I	15				
STAT 210 - Introduction to Statistics with R	15				
ECON 101 - Introductory Economics	15				

Intended learning outcomes at **Level 4** are listed below:

<u>Learning Outcomes - LEVEL 4</u>	
3A. Knowledge and understanding	
Learning outcomes:	Learning and teaching strategy/ assessment methods
On completion of this level you will be able to: A1. understand a computer science related scientific method and its applications to problem-solving in a specific area A2. identify and describe some essential facts A3. describe and explain principles and theories relating to subject areas of computer science A4. identify knowledge and name computer applications as appropriate to the module of study	Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material. Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work. Tools to be used to achieve this will include some or all from the following: • printed and online teaching texts • directed readings from textbooks and papers • Specialised software tools.

Learning Outcomes – LEVEL 4

3A. Knowledge and understanding

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3B. Cognitive skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
On completion of this level you will be able to: B1. recognise critical thinking, including its relevance to everyday life B2. identify such knowledge and understanding in the modelling and design of computer-based systems B3. outline the criteria and specifications appropriate to specific problems B4. review the criteria met by a computer system, as they are defined for its current use and future development B5. name and discuss a set of rational and reasoned arguments, addressing a given problem or opportunity in a target audience. B6. give simple examples of economic, professional, social, environmental, moral and ethical issues in the sustainable exploitation of computer technology	Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material. Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work. Tools to be used to achieve this will include some or all from the following: • printed and online teaching texts • directed readings from textbooks and papers • Specialised software tools. Support of learning: Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor. Tools to be used to achieve this will include some or all from the following: • self-assessment questions and exercises, included in the teaching texts • programming tasks, computer-based investigations and open-ended project work • feedback and guidance from an instructor; tutorials, revisions and in-class activities • e-mail and individual instructor-learner conferences • Study and project guides. Assessment of learning: An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

3B. Cognitive skills

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3C. Practical and professional skills

Learning outcomes:

On completion of this level you will be able to:

- C1. **Recognise** and **describe** the high-level architecture of computer-based systems
- C2. **Identify** the quality attributes and possible trade-offs a system in the context of a given problem
- C3. **Name** any risks or safety aspects during the deployment of a system or solution in the context of a given problem
- C4. **Compare** some of the essential tools per study area, used for the construction and documentation of an application.

Learning and teaching strategy/ assessment methods

Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material.

Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work.

Tools to be used to achieve this will include some or all from the following:

- printed and online teaching texts
- directed readings from textbooks and papers
- Specialised software tools.

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work

3C. Practical and professional skills

- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3D. Key/transferable skills

Learning outcomes:

On completion of this level you will be able to:

- D1. be enumerate and literate in **describing** cases which involve both quantitative as well as qualitative dimensions
- D2. Retrieve information from various sources (search engines, catalogues etc.)
- D3. **operate** general Information Technology facilities
- D4. **practice** on the effective goal setting and action planning

Learning and teaching strategy/ assessment methods

Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material.

Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work.

Tools to be used to achieve this will include some or all from the following:

- printed and online teaching texts
- directed readings from textbooks and papers
- Specialised software tools.

3D. Key/transferable skills

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

Programme Structure - LEVEL 5

Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
CSC 206 - Web Development	15			N/A	Varies by students cohort entrance (Fall or Spring)
CSC 300 - Mobile Application Development	15				
CSC 306 - Advanced Web Development	15				
CSC 310 - Hardware & Computer Architecture	15				
CSC 312 - Database Management Systems	15				
CSC 340 - Artificial Intelligence	15				
CSC 450 - System Analysis & Design	15				
MATH 220 - Discrete Mathematics	15				

Intended learning outcomes at **Level 5** are listed below

3A. Knowledge and understanding

Learning outcomes:	Learning and teaching strategy/ assessment methods
On completion of this level you will be able to: A1. practice on a computer science related scientific method and apply it for problem-solving in a specific area A2. identify and distinguish over a wide range of essential facts and concepts of Computer Science A3. experiment and test principles and theories on intermediate level A4. identify and name computer applications as appropriate to the module of study A5. analyse, test and experiment with the appropriate theory, practices and tools for the specification, design, implementation and evaluation of computer-based systems	Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material. Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work. Tools to be used to achieve this will include some or all from the following: • printed and online teaching texts • directed readings from textbooks and papers • Specialised software tools. Support of learning:

Intended learning outcomes at **Level 5** are listed below

3A. Knowledge and understanding

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3B. Cognitive skills

Learning outcomes:	Learning and teaching strategy/ assessment methods
On completion of this level you will be able to: B1. demonstrate critical thinking, including its relevance to everyday life B2. employ and apply such knowledge and understanding in the modelling and design of computer-based systems B3. predict and produce a set of the criteria and specifications appropriate to specific problems B4. formulate and revise the criteria met by a computer system, as they are defined for its current use and future development B5. Explain and illustrate a set of rational and reasoned arguments, addressing a given problem or opportunity in a target audience. B6. categorise a number of economic, professional, social, environmental, moral and ethical issues in the sustainable exploitation of computer technology B7. design and develop the appropriate theory, practises and tools for the specification, design, implementation and evaluation of computer-based systems	Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material. Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work. Tools to be used to achieve this will include some or all from the following: • printed and online teaching texts • directed readings from textbooks and papers • Specialised software tools. Support of learning: Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor. Tools to be used to achieve this will include some or all from the following: • self-assessment questions and exercises, included in the teaching texts • programming tasks, computer-based investigations and open-ended project work • feedback and guidance from an instructor; tutorials, revisions and in-class activities • e-mail and individual instructor-learner conferences • Study and project guides. Assessment of learning: An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

3B. Cognitive skills

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3C. Practical and professional skills

Learning outcomes:

On completion of this level you will be able to:

- C1. **Construct** and **illustrate** the architecture of reliable, secure and usable computer-based systems
- C2. **analyse** and **examine** the quality attributes and possible trade-offs a system in the context of a given problem
- C3. **Inspect** and **test** any risks or safety aspects during the deployment of a system or solution in the context of a given problem
- C4. **Employ** some of the essential tools per study area, used for the construction and documentation of an application.
- C5. **Operate** under specific project requirements to produce deliverables that take into consideration project/system requirements and budget.
- C6. **Analyse** and **discover** the process involved in the development and deployment of a system for solving real-life problems

Learning and teaching strategy/ assessment methods

Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material.

Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work.

Tools to be used to achieve this will include some or all from the following:

- printed and online teaching texts
- directed readings from textbooks and papers
- Specialised software tools.

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work

3C. Practical and professional skills	
	• feedback and guidance from an instructor; tutorials, revisions and in-class activities • e-mail and individual instructor-learner conferences • Study and project guides. Assessment of learning: An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken. Tools to be used to achieve this will include some or all from the following: • Instructor-Marked summative formal examinations • Instructor-Marked summative projects • Instructor-Marked summative presentations • Instructor-Marked formative assignments/assessment • Instructor-Marked formative projects

3D. Key/transferable skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
On completion of this level you will be able to: D1. be enumerate and literate in describing cases which involve both quantitative as well as qualitative dimensions D2. retrieve information from various sources (search engines, catalogues etc.) D3. operate general Information Technology facilities D4. practise on the effective goal setting and action planning D5. Identify problems that may arise and devise their solutions in the context of a computer science project D6. Outline and generate the best possible outcome while working along with a group of individuals	Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material. Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work. Tools to be used to achieve this will include some or all from the following: • printed and online teaching texts • directed readings from textbooks and papers • Specialised software tools.

3D. Key/transferable skills

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

Programme Structure - LEVEL 6

Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
CSC 321 - Operating Systems	15	CSC 219 - Video Game Design	15	N/A	Varies by students cohort entrance (Fall or Spring)
CSC 322 - Computer Networks I	15	CSC 330 - Introduction to Mobile Robotics	15		
CSC 325 - Distributed Applications	15	CSC 333 - Computer Networks II	15		
CSC 412 - Object Oriented Design Patterns	15	CSC 422 - Advanced DBMS	15		
CSC 421 - Computer Systems Security	15	PRAC 300 - PRACTICUM	15		
CSC 443 - Thesis I	15				
CSC 444 - Thesis II	15				

Intended learning outcomes at **Level 6** are listed below:

<u>Learning Outcomes – LEVEL 6</u>	
3A. Knowledge and understanding	
Learning outcomes:	Learning and teaching strategy/ assessment methods
A. Knowledge and understanding - On completion of this level you will be able to: A1. reproduce a computer science related scientific method and extend its applications to problem-solving in a specific area A2. employ and practice advanced facts A3. model and test principles and theories relating to subject areas of computer science A4. analyse knowledge and revise computer applications as appropriate to the module of study A5. assess, interpret and evaluate the appropriate theory, practices and tools for the specification, design, implementation and evaluation of computer-based systems	Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material. Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work. Tools to be used to achieve this will include some or all from the following: • printed and online teaching texts • directed readings from textbooks and papers • Specialised software tools. Support of learning:

Learning Outcomes – LEVEL 6

3A. Knowledge and understanding

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3B. Cognitive skills

Learning outcomes:

B. Cognitive skills - On completion of this level you will be able to:
B1. **demonstrate** critical thinking, including its relevance to everyday life

Learning and teaching strategy/ assessment methods

Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material.

3B. Cognitive skills

B2. **combine** and **interpret** such knowledge and understanding in the modelling and design of computer-based systems

B3. **devise** and **judge** a set of the criteria and specifications appropriate to specific problems

B4. **measure** and **assess** the criteria met by a computer system, as they are defined for its current use and future development

B5. **compare** and **conclude** to a set of rational and reasoned arguments, addressing a given problem or opportunity in a target audience.

B6. **rate** a number of economic, professional, social, environmental, moral and ethical issues in the sustainable exploitation of computer technology

B7. **propose** and **argue** on the appropriate theory, practises and tools for the specification, design, implementation and evaluation of computer-based systems

Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work.

Tools to be used to achieve this will include some or all from the following:

- printed and online teaching texts
- directed readings from textbooks and papers
- Specialised software tools.

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment

3B. Cognitive skills

- Instructor-Marked formative projects

3C. Practical and professional skills

Learning outcomes:

On completion of this level you will be able to:

- C1. **Design** and **illustrate** the architecture of reliable, secure and usable computer-based systems
- C2. **Predict** and **justify** the quality attributes and possible trade-offs a system in the context of a given problem
- C3. **Estimate** and **evaluate** any risks or safety aspects during the deployment of a system or solution in the context of a given problem
- C4. **Develop** some of the essential tools per study area, used for the construction and documentation of an application.
- C5. **Operate** under specific project requirements to produce deliverables that take into consideration project/system requirements and budget.
- C6. **Assess** and **revise** the process involved in the development and deployment of a system for solving real-life problems

Learning and teaching strategy/ assessment methods

Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material.

Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work.

Tools to be used to achieve this will include some or all from the following:

- printed and online teaching texts
- directed readings from textbooks and papers
- Specialised software tools.

Support of learning:

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

3C. Practical and professional skills

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

3D. Key/transferable skills

Learning outcomes:

On completion of this level you will be able to:

- D1. be enumerate and literate in **describing** cases which involve both quantitative as well as qualitative dimensions
- D2. retrieve information from various sources (search engines, catalogues etc.)
- D3. **operate** general Information Technology facilities
- D4. **practise** on the effective goal setting and action planning
- D5. **Identify** problems that may arise and **devise** their solutions in the context of a computer science project
- D6. **Outline** and **generate** the best possible outcome while working along with a group of individuals

Learning and teaching strategy/ assessment methods

Guided teaching environment (Lectures & labs) is the principal method of delivery for the concepts, principles and skills involved in the outcomes. Students are also directed to reading from textbooks, academic papers and other relevant material.

Understanding is reinforced by means of exercise classes, discussion groups, laboratories, assignments and project work.

Tools to be used to achieve this will include some or all from the following:

- printed and online teaching texts
- directed readings from textbooks and papers
- Specialised software tools.

Support of learning:

3D. Key/transferable skills

Learning is supported outside the classroom with the use of the learning management system Moodle, instructor office hours, sample answers to assessment and extra lectures as seen appropriate by the instructor.

Tools to be used to achieve this will include some or all from the following:

- self-assessment questions and exercises, included in the teaching texts
- programming tasks, computer-based investigations and open-ended project work
- feedback and guidance from an instructor; tutorials, revisions and in-class activities
- e-mail and individual instructor-learner conferences
- Study and project guides.

Assessment of learning:

An assessment of the understanding of underlying concepts and principles forms part of the overall assessment of final exams/projects submitted/taken.

Tools to be used to achieve this will include some or all from the following:

- Instructor-Marked summative formal examinations
- Instructor-Marked summative projects
- Instructor-Marked summative presentations
- Instructor-Marked formative assignments/assessment
- Instructor-Marked formative projects

7. CURRICULUM MAP COMPUTER SCIENCE

This table indicates which study units assume responsibility for delivering and assessing particular programme learning outcomes.

Level	Study module/unit	Programme outcomes																					
		A 1	A 2				B 1	B 2						C 1	C 2	C 3			D 1	D 2	D 3		
Enhancement modules	Politics 101	✓	✓				✓	✓						✓	✓	✓			✓	✓	✓		
	CS 192	✓												✓	✓	✓			✓	✓	✓		
	History 120	✓	✓				✓	✓						✓	✓	✓			✓	✓	✓		
	English 102	✓						✓							✓	✓			✓	✓	✓		
	English 204	✓	✓					✓							✓	✓			✓	✓			
	Math 101	✓	✓											✓	✓	✓			✓	✓	✓		
	Philosophy 101	✓	✓				✓	✓							✓	✓			✓	✓	✓		
	Psychology 101	✓	✓					✓							✓	✓			✓	✓	✓		

Level	Study module/unit	Programme outcomes																					
		A 1	A 2	A 3	A 4		B 1	B 2	B 3	B 4	B 5	B 6		C 1	C 2	C 3	C 4		D 1	D 2	D 3	D 4	
4	CSC 105 - Structured Programming	✓	✓	✓			✓	✓	✓		✓			✓	✓						✓	✓	
	CSC 106 - Object Oriented Programming	✓	✓	✓			✓	✓	✓		✓			✓	✓						✓	✓	✓
	CSC 205 - Business Data Management	✓	✓	✓	✓		✓				✓	✓			✓		✓		✓		✓	✓	
	CSC 215 - Data Structures	✓	✓	✓	✓			✓	✓		✓				✓		✓		✓	✓		✓	
	CSC 230 - Systems Programming	✓	✓	✓			✓	✓		✓		✓		✓	✓		✓		✓	✓		✓	
	MATH 120 - Calculus I	✓	✓						✓		✓				✓					✓		✓	
	STAT 210 - Statistics with R	✓	✓						✓						✓					✓		✓	
	ECON 101 – Introductory Macroeconomics	✓	✓				✓	✓			✓	✓					✓			✓		✓	

Level	Study module/unit	Programme outcomes																							
		A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	B 6	B 7	C 1	C 2	C 3	C 4	C 5	C 6	D 1	D 2	D 3	D 4	D 5	D 6
5	CSC 206 - Web Development	✓	✓			✓	✓			✓			✓	✓			✓					✓	✓		
	CSC 300 - Mobile Application Development	✓		✓		✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
	CSC 306 - Advanced Web Development	✓	✓	✓		✓	✓		✓	✓			✓	✓		✓	✓		✓		✓		✓	✓	
	CSC 310 - Hardware & Computer Architecture	✓	✓			✓	✓					✓	✓	✓	✓		✓				✓	✓		✓	
	CSC 312 - Database Management Systems	✓		✓	✓	✓	✓			✓			✓	✓	✓	✓	✓		✓		✓		✓	✓	
	CSC 340 - Artificial Intelligence	✓	✓			✓	✓		✓		✓	✓	✓	✓	✓		✓				✓	✓	✓		✓
	CSC 450 - System Analysis & Design	✓	✓	✓		✓	✓			✓		✓	✓	✓				✓	✓		✓		✓	✓	
	MATH 220 - Discrete Mathematics	✓	✓	✓	✓						✓				✓						✓	✓			

Level	Study module/unit	Programme outcomes																							
		A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	B 6	B 7	C 1	C 2	C 3	C 4	C 5	C 6	D 1	D 2	D 3	D 4	D 5	D 6
6	CSC 219 – Video Game Design		✓	✓					✓		✓		✓	✓	✓		✓	✓		✓		✓		✓	✓
	CSC 321 - Operating Systems		✓		✓	✓		✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓			
	CSC 322 - Computer Networks I	✓		✓		✓	✓	✓			✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	
	CSC 325 - Distributed Applications	✓	✓	✓	✓		✓	✓		✓			✓	✓	✓	✓	✓		✓	✓	✓	✓			
	CSC 330 – Introduction to Mobile Robotics		✓	✓	✓		✓		✓		✓			✓			✓	✓		✓		✓		✓	✓
	CSC 333 – Computer Networks II	✓	✓		✓	✓	✓	✓		✓	✓		✓	✓	✓	✓			✓	✓	✓	✓	✓		
	CSC 412 - Object Oriented Design Patterns		✓	✓		✓	✓		✓		✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
	CSC 421 - Computer Systems Security		✓		✓	✓		✓		✓	✓	✓		✓		✓		✓		✓	✓		✓	✓	✓
	CSC 422 – Advanced DBMS	✓	✓		✓		✓		✓	✓			✓	✓	✓		✓		✓	✓	✓	✓	✓		
	PRAC 300 - Practicum		✓			✓					✓	✓					✓	✓	✓		✓	✓	✓	✓	✓
	CSC 443 - Thesis I	✓		✓	✓		✓	✓	✓					✓	✓	✓		✓		✓	✓	✓	✓		

	CSC 444 - Thesis II	☒	☒	☒	☒		☒			☒	☒	☒	☒		☒			☒	☒	☒		☒		☒	☒	☒		
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8. MODULE SPECIFICATIONS

1. 1. Factual information				
Module title		English 102: Composition Writing II		
Module tutor		Dr. Filio Chasioti	Level	Enhancement
Module type		100% Face to face	Credit value	15
Notional learning hours: 150		Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		
2. Rationale for the module and its links with other modules				
English 102 is designed to further critical reading and writing whilst emphasizing critical inquiry and research. In the first part of the module, students engage in reflective writing, conduct primary research and learn how to produce research based writing in formats appropriate to content, purpose, genre and audience. Working as researchers, class members will locate, read, evaluate, analyse, and synthesise appropriate sources as they develop and refine their research projects. To this end, research is emphasized as the path of inquiry not just information that comes from the library but also through observations, interviews and personal experience. In the second half of the module, students will be introduced to the mode of argumentation and argumentative strategies whilst demonstrating critical thinking and logical reasoning. In this part of the module, students are encouraged to take a stance on issues of public concern, so as to begin to view themselves as engaged citizens.				
3. Aims of the module				
Students in English 102 will develop writing and critical thinking abilities requisite to planning, elaborating and completing research papers. By the end of the module, students will be able to identify valid issues for research purposes and employ research methods to locate and record accurate, valid information relevant to an academic research project. In addition to developing common academic writing practices such as summarizing and paraphrasing, students will be able to judge the value of information including distinguishing between primary and secondary sources.				
4. Pre-requisite modules or specified entry requirements				
NA				
Indicative content				
English 102 is designed to improve academic writing and extend critical thinking skills developed in English 101. Students are requested to work as researchers and learn how to create logical arguments and write persuasively about an issue not only for their class members, but also for audiences beyond the classroom setting. It is assumed that all students will invest substantial time on self-study and language improvement. Module readings/sample research projects are provided to generate topics and to study as models for structure and style in composition.				

1. 1. Factual information			
Module title		ENGLISH 204: Business/Professional Communication	
Module tutor		Dr. Ian Kehoe	Level Enhancement
Module type		100% Face to face	Credit value 15
Notional learning hours: 150		Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours	
2. Rationale for the module and its links with other modules			
This is a required module for all students. Students are given the opportunity to acquire essential professional communication skills, both oral and written in order for them to communicate effectively in their major field of study as well as preparing them for communication in the business world.			

3. Aims of the module
This module aims to help students with professional writing and oral communication skills, guiding them through the principles of business and professional communication. Basic principles of email writing in various forms (e.g. to persuade, to complain, to instruct) as well as focus on business reports and proposals are covered. Students are encouraged to participate in class activities in order which further their spoken language abilities as well as to present an individual oral presentation on a subject of their choice.
4. Pre-requisite modules or specified entry requirements
English 102
Indicative content
The module focuses on professional reading writing and speaking skills and provides instruction in drafting and revising various forms of business and professional communication such as emails, proposals and reports. Through class discussions and other oral activities, students will have the opportunity to enhance their public speaking skills. The module covers all fundamental principles of professional writing, including a focus on appropriate grammar, mechanics and usage. Module readings/samples of professional writing are provided to generate topics and to study as models for structure and style in professional writing.

1. 1. Factual information			
Module title	History 120: The Modern World		
Module tutor	Dr. Joe Gratale	Level	Enhancement
Module type	100% Face to face	Credit value	15
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		
2. Rationale for the module and its links with other modules			
This Module is part of the Humanities and Fine Arts Enhancement Requirements required for all students. It introduces students to major global historical developments from the 16 th century to the present, allowing them to acquire a broad understanding of the shaping of the modern world.			
3. Aims of the module			
This module sets out to explore and investigate a wide range of developments relating to modern global history. The module begins in the 1500s with the growing interaction among the world’s peoples, and concludes in the early twenty-first century with today’s highly integrated, but also uneven and divided world. In the main, we will consider the contributions of various individuals, societies, cultures, and communities to what is a seemingly endless flow of ‘stories’ and narratives. We will focus on an array of topics and themes such as: social change and revolution; patterns of cultural development and cross-cultural exchange; intellectual thought and systems of knowledge; forms of political organization and the politics of power; aspects of economic relations and technological advances; as well as issues related to war, justice, and peace. In order to constructively engage with such material this module will embrace a cross-disciplinary approach, embracing a range of domains from the social sciences and humanities. Alongside analyses of written texts, we will also consider various visual forms and media including photography, film, documentary, painting/sculpture, and architecture in order to locate different perspectives and responses to what constitutes the global historical experience.			
4. Pre-requisite modules or specified entry requirements			
No			
Indicative content			
<u>week 1</u> Change in history: how is the contemporary world different from the one 500 years ago? Columbus and the “discovery” of the Americas. Slavery in the New World.			
<u>week 2</u>			

The fall of the Byzantine Empire, and the rise of the Ottoman Empire. Muslims, Christians, and Jews in the Ottoman Empire

The Reformation and Counter-Reformation in Europe. The Thirty Years War (1618-48) and the birth of the modern states system

week 3

The Age of Absolutism. The Scientific Revolution and the Enlightenment. 18th century Europe and the French Revolution (I)

The French revolution (II). Napoleon; and the Napoleonic wars. The Congress of Vienna (1815) (I)

week 4

The Industrial Revolution. Europe and the World in the Age of Revolutions (1815-1848)

The Congress of Vienna (1815) (II); Europe and the World in the Age of Revolutions and Empires (1815-1914) **(deadline to submit writing assignment; by Sunday, 23:59)**

week 5

“New Imperialism” and colonialism in Africa and Asia

Interstate rivalries in Europe, 1870-1914; the First World War (1914-18)

week 6

The “Greater War” (1918-23); peace at the end of WWI (1918-19); **1st short in-class test**

week 7

The Russian Revolution of 1917; the rise of communism; and the Russian civil war

Europe and the world in the interwar era: the “roaring ‘20s”; and the rise of totalitarianism: Fascism; Nazism; Stalinism

Week 8

The Second World War and its origins; genocide; and the Holocaust

The postwar world: The origins of the Cold War in Europe and the world

Week 9

Decolonization and the Cold War in the Third World

Postwar culture in the West: Sex, drugs and rock’n’roll; socialist societies (1950s-1980s)

Week 10

The late phase and end of the Cold War; global (dis)order in the 1990s and after 9/11

Class presentations

Week 11

Class presentations

Module overview and revision; **2nd short in-class test**

1. Factual information			
Module title	PHILOSOPHY 101- Introduction To Philosophy And Critical Thinking		
Module tutor	Dr. Ian Kehoe	Level	Enhancement
Module type	100% Face to face	Credit value	15
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		
2. Rationale for the module and its links with other modules			
The rationale of this module is to equip the students with the ability to see the fundamental questions that motivate the different disciplines in both social and positive sciences.			
3. Aims of the module			

The purpose of this module is to introduce students to the essential questions of philosophy and the varied ways in which philosophers have posed and answered these questions. They will be familiarized with asking questions about the fundamental dimensions of being and reality; questioning aspects of existence that we take for granted. While the module focused on the Western philosophical traditions, the class also introduces the ideas from the non-Western traditions such as Hinduism and Buddhism.

4. Pre-requisite modules or specified entry requirements

N/A

Indicative content

- 1. Introduction: What is philosophy? Subfields of philosophy. Open and closed questions.
- 2. Epistemology: How is knowledge possible? Belief, science and truth. The Skeptic's challenge.
- 3. Mind and Body: How are they related? Can computers think?
- 4. Self: What is the self? Consciousness and the subconscious. The question of personal identity.
- 5. Freedom and determinism: To what extent are we free? Reasons and causes.
- 6. God: Arguments for and against God's existence.
- 7. Essence and existence. Objective values and relativism.
- 8. The meaning of life.

1. Factual information

Module title	POLITICS 101: Contemporary politics		
Module tutor	Dr. Pavlos Koktsidis	Level	Enhancement
Module type	100% Face to face	Credit value	15
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules

The purpose of this module is to help students discard the negative baggage they carry with them instinctively about politics in order to examine somewhat more objectively the main issues and branches of the academic discipline commonly called political science.

3. Aims of the module

Politics is one of the richest fields of human inquiry, made all the more essential in that just about everything we do in this life can be interpreted to have a political sense. This module is concerned with contemporary politics on two distinct levels. First, it deals with those activities and issues of importance to anyone who is a member of a modern liberal democratic polity -- rights and responsibilities, voting and political participation, power, authority, and legitimacy, ideology and culture -- in short, political socialization and citizenship. Second, it examines how polities govern themselves and relate with other polities, through a study of the branches of government, of political parties and interest groups, and of different actors in international relations.

4. Pre-requisite modules or specified entry requirements

No

Indicative content

The module begins by recapitulating the work, methods and subfields of political science, major political ideologies, the concept of political culture, political communication and the processes of political socialization. The module then moves on to consider the parameters of political participation, the individual and the citizen in the political process, to the understanding of political groups (interest groups, political parties) as well as international politics and conflict resolution. It then considers lawmaking and the division of power, government at work, executives and bureaucrats, public policy and policy formation and the notion of justice and legal cultures. It finally discusses different types of local, regional, provincial and federal governments, international government, the contemporary international system as well as political and economic globalisation and the prospects for global democracy.

Indicative readings from the textbook (see below):

Chapter 1 Politics, Setting the stage, pages 7-21

Chapter 3 The modern State, pages 65-77

Chapter 8 Political Culture and Political Socialization, pages 198-209

Chapter 11 Political Parties, pages 263-273

Chapter 12 Interest groups, pages 295-303

Chapter 14 Parliamentary government pages 327-339

Chapter 15 Presidential government pages 350-363

And readings uploaded on Moodle.

1. 1. Factual information			
Module title	PSY 101: Introduction to Psychology		
Module tutor	Dr. Chalkia Anastasia	Level	Enhancement
Module type	100% Face to face	Credit value	15
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		
2. Rationale for the module and its links with other modules			
This is a required introductory level for both psychology and non-psychology majors.			
3. Aims of the module			
This module aims at providing a comprehensive introduction to the essential principles of the academic discipline of psychology by addressing such important topics as the history and evolution of psychology, biological basis of behaviour, memory and intelligence, personality, mental disorders and treatment, stress, coping and health and finally research methods and ethics in psychology. For each of the above topics the major theoretical approaches, research findings, and historical and contemporary trends in the science of psychology will be presented and explained. Students are encouraged to assess the contribution and applicability of psychological research to daily life through class discussions, presentations and written assignments.			
4. Pre-requisite modules or specified entry requirements			
N/A			
Indicative content			
- Introduction to the science of Psychology - Psychology Research - Biology and Behavior-The Brain - Developmental psychology - Sensation, perception, consciousness - Learning & memory - Decision Making I Cognition, Language, & Intelligence - Emotion & Motivation Culture - Social psychology - Personality - Psychological Measurement - Psychological Disorders & Therapies - Psychological Health Positive Psychology - Other areas of Psychology Current and future issues in Psychology			

1. 1. Factual information			
Module title	CSC 192: Object Oriented Programming with Python		
Module tutor	Dr. Chatzistavros Vagelis		
Module type	100% Face to face	Level	Enhancement
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		
2. Rationale for the module and its links with other modules			
This module serves as a foundational programming module with a strong emphasis on object-oriented programming (OOP) and software design principles. It is designed to equip students with practical software development skills using Python, one of the most versatile and widely-used programming languages in industry. The module addresses the growing demand for programming literacy across various professional fields, from data analysis to web development and scientific computing. The module's placement within the degree scheme is strategic, serving as: • A gateway to advanced programming concepts and specialized technical modules. • A practical foundation for students pursuing careers in software development, data science, or technical analysis. • An essential skill-building component for modern technological literacy. Learning Context This module emphasizes hands-on learning through practical coding exercises and real-world problem-solving. The structure allows for extensive practice and progressive skill development, moving from basic syntax to more complex programming concepts, with a strong focus on object-oriented design and software engineering practices.			
3. Aims of the module			
The primary aims of this module are to: 1. Develop Fundamental Programming Skills ○ Master Python syntax and basic programming concepts. ○ Understand and apply computational thinking principles. ○ Develop problem-solving strategies using programmatic solutions. 2. Build Practical Software Development Capabilities ○ Write clean, readable, and maintainable code using object-oriented principles. ○ Implement error handling and debugging techniques. ○ Use design patterns for class and data manipulation. 3. Enable Data Manipulation and Analysis ○ Work with various data types and structures. ○ Process and analyze data using Python libraries. ○ Implement file handling operations for data input/output. 4. Foster Professional Programming Practices ○ Develop a systematic approach to program design. ○ Apply best practices in code documentation. ○ Understand and implement basic software development methodologies. 5. Create Foundation for Advanced Programming ○ Introduce object-oriented programming concepts (classes, inheritance, polymorphism, encapsulation). ○ Establish a basis for learning other programming languages. ○ Prepare for advanced software development modules.			

6. Cultivate Real-World Application Skills ○ Solve practical programming challenges. ○ Develop mini-projects based on real-world scenarios. Learn to use third-party libraries and APIs effectively.
4. Pre-requisite modules or specified entry requirements
N/A
Indicative content

Course 1: Programming Fundamentals

Introduction to Python Basics

- Module overview and Python environment setup
- Variables, data types, and basic operators
- Input/output operations
- Writing and running simple programs

Control Structures

- Conditional statements (if, elif, else)
- Boolean expressions and logical operators
- Loops (while and for)
- Loop control statements
- Exceptions
- Practice exercises with basic algorithms

Functions and Basic Programming

- Function definition and parameters
- Lambda functions
- Built-in functions
- Practice exercises with function-based problem-solving

Course 2: Object-Oriented Programming

Introduction to Classes and Objects

- Defining classes and creating objects
- Understanding instance variables and methods
- The significance of the self parameter

Attributes and Methods

- Class attributes vs. instance attributes
- Defining and calling methods
- Modifying attributes within methods

Constructors and Destructors

- The __init__ method for initialization
- The __del__ method for cleanup
- Resource management within classes

Inheritance and Polymorphism

- Single and multiple inheritance
- Overriding methods in subclasses
- Using the super() function
- Polymorphic behavior in Python

Encapsulation and Abstraction

- Public, protected, and private access modifiers
- Implementing getter and setter methods
- Abstract classes and methods

Interfaces

- Defining and implementing interfaces in Python
- The role of interfaces in achieving polymorphism

Magic Methods and Operator Overloading

- Understanding dunder (double underscore) methods
- Overloading operators (e.g., __add__, __str__)
- Enhancing class functionality with magic methods

Class and Static Methods

- Defining and using @classmethod and @staticmethod decorators
- Differences between class methods, static methods, and instance methods

Property Decorators

- Using @property for attribute access control
- Creating read-only and write-only properties

Practice with OOP Concepts

- Hands-on exercises and projects to apply OOP principles
- Building real-world applications using OOP

Course 3: Data Structures and Algorithm Implementation

Basic Data Structures

- Lists and list comprehensions
- Tuples and their applications
- Dictionaries and dictionary comprehensions
- Sets and set operations

Algorithm Implementation

- Sorting algorithms (e.g., bubble sort, quicksort, merge sort)
- Searching algorithms (e.g., linear search, binary search)
- Optimization with Python libraries (e.g., itertools, functools)
- Practice exercises with algorithm implementation

Course 4: Design Patterns

Introduction to Design Patterns

- Understanding the importance of design patterns
- Categories of design patterns: Creational, Structural, Behavioral

Creational Patterns

- Singleton Pattern: Ensuring a class has only one instance
- Factory Method Pattern: Creating objects without specifying the exact class
- Abstract Factory Pattern: Providing interfaces for creating related objects
- Builder Pattern: Constructing complex objects step by step

Structural Patterns

- Adapter Pattern: Allowing incompatible interfaces to work together
- Decorator Pattern: Adding behavior to objects dynamically

Behavioral Patterns

- Observer Pattern: Defining a subscription mechanism to notify multiple objects of state changes
- Strategy Pattern: Defining a family of algorithms and making them interchangeable
- Command Pattern: Encapsulating requests as objects
- Template Method Pattern: Defining the skeleton of an algorithm in a method, deferring some steps to subclasses

Applying Design Patterns in Python

- Implementing design patterns using Python's features
- Model-View-Controller (MVC) paradigm as a design pattern.
- Real-world examples and case studies
- Best practices and common pitfalls

Course 5: Python Libraries for Data Manipulation

NumPy Fundamentals

- Arrays and array operations
- Mathematical functions
- Array indexing and slicing
- Linear algebra operations
- Basic optimization techniques

Pandas Basics

- Series and DataFrames
- Data importing and exporting
- Indexing and selection
- Data transformation and basic cleaning

Course 6: Python Libraries for Data Visualization

- Matplotlib fundamentals: basic plotting, customizing plots, saving/exporting plots
- Seaborn for statistical data visualization: distribution plots, regression plots, categorical plots
- Heatmaps and advanced visualizations

Course 7: Review and Final Project Delivery

- Review
- Project presentation and documentation

1. 1. Factual information

Module title	MATH 101: Elements of finite mathematics		
Module tutor	Dr. Daskalogiannis Vasilis	Level	Enhancement
Module type	100% Face to face	Credit value	15
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules

This course consists of studies in functions, matrices, systems of equations, linear programming, set theory, probability, and mathematics of finance with applications to the field of computing and business. The course will be problem oriented and emphasis will be given to applications (Modeling-Optimization etc.).

3. Aims of the module

This course seeks to develop a further understanding of the process of learning mathematics. It will also provide:

- The foundation in elementary functions necessary for future math courses.
- The knowledge of the basic matrix operations as well as their use in mathematical modeling.
- Basic knowledge of different Number representations (binary, hexadecimal, etc.)
- Theory and practice on how to perform mathematical optimization, specifically linear programming.
- Foundations of the mathematics of finance, computational tools to the various forms of interest computation, annuities and loan balance.
- Foundations of Logic and Circuits
- Foundations of the mathematics of probability and counting Techniques.

4. Pre-requisite modules or specified entry requirements

N/A

Indicative content

Functions and Applications
 The mathematics of Finance
 Systems of Linear Equations
 Matrix Algebra and Applications
 Linear Programming
 Sets and Counting
 Probability
 Circuits & Logic
 Number representations

1. Factual information

Module title	COMPUTER SCIENCE 105: Introduction to Programming I – Structured Programming		
Module tutor	Dr. Astaras Alexandros	Level	4
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		

Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours
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2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This is an introduction to computing and computer programming using the Java language. It is one of the two options available for all students to satisfy the mandatory 1st year computing module requirement (the other option is CS101). It is the only option for those students interested in keeping their options open towards pursuing a major in Computer Science. This module is designed for students who have no prior experience in programming, just some basic exposure to computing devices as users.

3. Aims of the module

Students are introduced to the basic elements of computing hardware, information technology and computer programming. Programming is explained, demonstrated and practiced using the Java programming language. Ultimately the module aims to advance beyond basic computing skills towards software engineering, instructing students to develop autonomy as sophisticated computer users and programmers.

4. Pre-requisite modules or specified entry requirements

None. It is expected that students have already had some exposure to a windows-based graphical user interface computing environment (Microsoft Windows, Apple OS, Linux/Unix or equivalent).

5. Is the module compensatable?

N/A

8. Indicative content.

Hardware and Software (approx. 2 weeks)

- General computer science topics.
- Analog and binary signals.
- Machine language and high level languages.

Theory of Programming (approx. 2 weeks)

- Compilers
- Algorithms
- Problem Decomposition – Stepwise Refinement

Java Programming (rest of the semester)

- How to run Java programs.
- Translating Java source code into bytecodes.
- How byte codes are interpreted.
- How to create a Java program.
- Writing a program
- Java variable types
- Storing and changing values in variables
- Selection statements
- Repeating actions with loops
- Using arrays
- User input error trapping

1. Factual information

Module title	COMPUTER SCIENCE 106 - Introduction to Programming II – Object Oriented Programming
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Module tutor	Dr. Victoratos Iosif	Level	4
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules

The module aims to refine the participants' fundamental programming skills. It builds upon CS105 (Introduction to Programming I) and serves as preparation for CS215 (Data Structures). It is based on the Java programming language.

3. Aims of the module

The module covers of Object Oriented Modeling and Applications. Topics include Object Models, Object Class Design, Inheritance and Polymorphism, Software Reuse with Classes, Application Modeling, Simulation with Object Classes, and Business Process Modeling with Objects. Additionally introduces Integrated Development Environments and Version Control Systems.

Object-oriented programming (OOP) was a revolutionary concept that changed the rules in computer program development. OOP is organized around "objects" rather than "actions", data rather than logic. Historically, a program has been viewed as a logical procedure that takes input data, processes it, and produces output data. The programming challenge was seen as how to set up the logic, not how to define the data. Object-oriented programming adopts the viewpoint that "what we really care about" are the objects we want to manipulate rather than the logic required to manipulate them.

Modern software development requires to maintain the source code in secure repositories, where the changes done by developers can be identified. A Version Control System (VCS) allows the developer to essentially backup the locally changed source code into the repository and restore the changes to another development workstation. The module aims to familiarize students with the importance of backup in Information Security, and also accountability, by including VCS practices. Some basic security practices that are done in a VCS, is maintaining credentials for authenticating to different VCS servers, understanding shared/private access control, and logging of changes. Moreover, it aims to provide a simplistic approach to the advanced concept of Disaster Recovery (DR), by allowing students to restore code and continue working in another system and/or rolling back changes that created software defects.

The module expands on the material covered in CS105 with the following aims:

- Further cultivation of algorithmic thinking and refinement of procedural programming skills.
- Familiarization with the Object Oriented programming methodology.
- Exposure to Java classes for building graphical interfaces and other extensions.
- Introduction to basic IT security through operations of a Version Control System.

4. Pre-requisite modules or specified entry requirements

CS105

5. Is the module compensatable?

N/A

8. Indicative content

Functions and modules

- *Methods*
- *Libraries and clients*
- *Recursion*

Object Oriented Programming Methodology

- *Data types*
- *Creating data types*
- *Inheritance*
- *Variable access control*
- *Polymorphism and Interfaces*
- *Testing and debugging*
- *Exception handling*

Interface design

- *Event handling*
- *Listeners*
- *Layout classes*
- *Inheritance*

Module title	COMPUTER SCIENCE 205 – Business Data Management		
Module tutor	Mr. Christos Christodoulou	Level	4
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules

The purpose of COMP SCI 205 is to introduce the idea of business data management, data modelling, and processing methodologies with the use of standalone design tools and personal databases. It aims at fostering proper data design through the relational methodology and developing all necessary data processing and presentation skills.

3. Aims of the module

The aims of this module are to:

Define the role of Systems Analyst and Database designer.

Explain System Analysis and interpersonal communication skills that the System Analyst must have

Explain Project Management and discuss tools that the system analyst must have

Explain the Methodologies that are used for Systems Analysis and Database Design

Explain the various tools that certain methodologies use

Provide students the opportunity to work on the most popular database (Oracle), in a project in order to implement the taught methodologies.

4. Pre-requisite modules or specified entry requirements

CS 105.

5. Is the module compensatable?

N/A

8. Indicative Content

This module deals with numerous forms of Business Data employed in monitoring business operations, including Data Analysis, Data Design, Table Design and learning how to implement them using two popular database programs.

Module title	COMPUTER SCIENCE 206 – Web Development		
Module tutor	Dr. Viktoratos Iosif	Level	5
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

COMP SCI 206 is an introductory module for beginning web designers. We will explore some essential concepts related to the creation of effective web sites. In the last portion of the module we will concentrate on client-side scripting using the programming language JavaScript.

3. Aims of the module

This module aims at introducing students the basic web design guidelines, Fundamentals of Hyper Text Markup Language (HTML), and how to use a Simple HTML Editor as well as Web Authoring Tools. Also, one of the main goals of the module will be to understand what scripting languages are and to be able to develop scripts.

4. Pre-requisite modules or specified entry requirements

N/A

5. Is the module compensatable?

N/A

8. Indicative content.

Web Design Guidelines

- What is the World Wide Web
- Basic Design Principles
- Interface & Navigation
- Good & Bad Design
- Colour on the WWW

Validation & Assessment

- Validating HTML and CSS
- Accessibility & Usability
- Web site optimization

HTML & CSS basics

- HTML source document, tags
- Lists, Tables, Links, Images, Graphics
- Intro to CSS
- CSS value and Common CSS Properties

HTML5 & CSS3

- New elements
- Multimedia, Canvas element
- Forms and Styles

Web Authoring Tools

- Setting Up a Web site
- Page Layout, CSS, Templates, Navigation
- Working with Texts, Lists and Tables

- Working with Images
 - Adding Interactivity (Flash, Forms)
 - Working with Online Data
 - Building Dynamic Pages with Data
 - Working with Code
 - Publishing to the Web
- JavaScript
- Introduction
 - Variables
 - Operators
 - Functions, Statements
 - Form validation

Module title	Computer Science 215 – Data Structures and Algorithms		
Module tutor	Dr. Grigoris Baglavas	Level	4
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The purpose of CS215 is to introduce students to the main concepts and implementation principles of data structures, using object oriented programming principles and Java as the programming language. This module builds on the knowledge and skills acquired in CS105 – Introduction to Programming I and CSC106 - Introduction to Programming II: Object Oriented Programming.

3. Aims of the module

The module starts with a fast paced review of object-oriented programming using Java, re-enforcing the fundamental programming concepts learned in CS105 and CS106. Students are subsequently introduced to data structures, including arrays, lists, queues, stacks, trees, heaps, hash tables and graphs. Searching, sorting, inserting, deleting and other simple operations on these structures will also be discussed.

4. Pre-requisite modules or specified entry requirements

CS106

5. Is the module compensatable?

N/A

8. Indicative content.

- Java object oriented programming (review)
- Object-Oriented Design
- Stacks, Queues
- Vectors and Lists
- Big-O notation
- Sorting algorithms
- Trees
- Heaps
- Search Trees
- Hash Tables
- Sorting

- Graphs

Module title	COMPUTER SCIENCE 219 - Video Game Design with Unity and 3ds Max		
Module tutor	TBA	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This module introduces the critical study of computer video games and the professional practice of game design. Through readings, discussions, research, and practical “hands-on” projects, students will better understand the current market for games and simulations and develop the fundamental skills necessary to enter the international computer games industry. Although the commercial video game pipeline will be discussed, the actual production framework for the class will mirror an 'Indie' game team "prototype game level" development.

3. Aims of the module

Students will be expected to fill multiple roles in the production process and gain hands-on experience in the collaborative processes of game design, project management, scripting, content creation pipeline, in game animation, and play-testing.

4. Pre-requisite modules or specified entry requirements

Computer Science 107

5. Is the module compensatable?

N/A

8. Indicative content.

Video Game Theory and Concepts

Game Types

Anatomy of a Game

The Key Components of Video Games

Structure of a Video Game

Design Components and Processes

The Stages of the Design Process

The Game Design Team Roles

The Game Design Documents

Gameplay as challenges and actions

Core Mechanics

Game Balancing

General Principles of Level Design

3ds Max

3d modeling and materials

The Game industry

Game Engines

Game delivery environments

Unity 3d Game Engine

Unity 3d concept

Unity3d User Interface (GUI)

The 3d workspace Unity Game Physics Scripting in Unity Player Camera Controllers Terrains Prefabs Audio Animation Particles AI and Enemies
Game Assets in Unity 3d Working with 3d assets in Unity Imported Assets and Packages Material and Textures

Module title	COMPUTER SCIENCE 230: Systems Programming		
Module tutor	Dr. Alexander Astaras	Level	4
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The module continues along the structured programming training approach introduced in CS105, aiming to familiarize students with the C++ language, a variety of fundamental software engineering challenges, as well methodologies to analyze them and design coding solutions. The module methodically cultivates the development of algorithmic design skills with increased emphasis on systems programming. More elaborate data structures are manipulated, the role of libraries accessing operating system resources (I/O streams, file streams, etc.) is discussed, demonstrated and practiced. Students are finally introduced to the concept of pointers within the historic context of evolution of object-oriented programming languages. In this manner the module serves as a bridge between programming fundamentals and the Computing Systems programming thread.

3. Aims of the module

The module employs a high-level language (C++) and further investigates structured programming, following up on the introductory programming module (CS105). More elaborate structures are introduced and employed in order to provide solutions for a wide range of tasks. The intricacies of the C/C++ languages are investigated and related to computer architecture: pointers, variable addresses, memory allocation.

In addition to further development of algorithmic thinking skills, the module also serves as an introduction to the Computing Systems programming thread. Furthermore, the module investigates the relationship of high-level programming languages with underlying computing hardware, while system programming tasks involving I/O are related to a variety of external devices (user interface, storage devices, microcontrollers with reduced memory/CPU resources, etc).

4. Pre-requisite modules or specified entry requirements

CS105 or permission by the instructor.

5. Is the module compensatable?

N/A

8. Indicative content.

- C++ primitive data types
- Control flow and structured programming in C++
- Arrays, structures, composite structures
- Disk and system I/O programming
- Exception handling
- Pointers and variable addresses
- Debugging and solution verification

Module title	COMPUTER SCIENCE 300 – Mobile Applications Programming		
Module tutor	Dr. Iosif Viktoratos	Level	5
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This module focuses on the fundamentals of mobile strategy and development, application architecture and design. Students will have the opportunity to learn the benefits and challenges of mobile application planning, design, development and strategy through real world examples and actual project work. Through readings, discussions, research, and practical “hands-on” projects, students will better understand the current market for mobile applications and develop the fundamental skills necessary to enter the mobile application industry. Security aspects will also be discussed.

3. Aims of the module

This module aims to teach how to build cross-platform mobile solutions to solve complex problems using iOS and Android phones and tablets. The module will teach students how to develop software for iOS and Android mobile devices through real world examples and strategies. Students will be guided through a complete mobile development lifecycle during the semester, and be given the opportunity to develop a series of applications.

4. Pre-requisite modules or specified entry requirements

CS 105 or permission by the Department. Students need to have basic knowledge of software development and object oriented programming

5. Is the module compensatable?

N/A

8. Indicative content.

- During the module, students will create applications using the Xcode IDE and Eclipse IDE software
- The module is broken up into seven modules:
- Introduction mobile application development
 - Overview of the Android Software Development Kit and Java programming language
 - Overview of the iOS Software Development Kit and objective-C programming language
- Mobile Strategy and Planning
 - Application models for mobile application frameworks
- Basic concepts when designing for mobile platforms for iOS and Android devices
 - User-interface design for mobile applications
 - Managing application data
- Development using both frameworks (for Android and iOS)

- Application Lifecycle
- User interface components
- Sensing
- Gestures and multi-touch interfaces
- Using the network and a database
- Integrating with Cloud Services
- Mobile Testing
 - Testing methodologies for mobile applications
- Deployment
 - Publishing
 - Deployment
 - Maintenance
 - Management

Module title	COMPUTER SCIENCE 306 – Advanced Web Development		
Module tutor	Dr. Iosif Vitoratos	Level	5
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules

COMP SCI 306 builds upon the skills and knowledge about creating and publishing Web pages and sites taught in CS 206. It also introduces students to advanced web development areas, required for students interested in pursuing a career in web site design.

3. Aims of the module

This module aims mainly on client-side scripting using the programming language JavaScript. The objective will be to understand what scripting languages are and to be able to develop scripts. The module will also offer an introduction to jQuery library, Asynchronous JavaScript and XML (AJAX), basically showing the benefits of their use and applying it to certain programming tasks. In the last portion of the module, students will gain a practical knowledge on advanced issues of the mostly used web development language, namely PHP. By combining lectures with seminar discussions and extensive hands-on experiences the module will introduce the students both to the applied aspects of web application development technologies, but also to the theoretical issues involved. Security aspects during the design of and development of a web application will also be discussed.

4. Pre-requisite modules or specified entry requirements

CSC 206

5. Is the module compensatable?

N/A

8. Indicative content.

JavaScript

- Advanced Techniques
- Detect visitor's Browser & Platform
- JavaScript Validation
- jQuery library
- jQuery UI & plugins

8. Indicative content.

Asynchronous JavaScript and XML

- Basics
- Ajax Frameworks
- XML/CSS into Ajax Applications

Advanced PHP

- Object-Oriented PHP
- Design Patterns for the Web

Module title	COMPUTER SCIENCE 310: Hardware & Computer Architecture		
Module tutor	Dr. Astaras Alexandros	Level	5
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This module addresses the structure and function of modern digital computing devices, ranging from the compilation process down to the hardware at the level of logic gates and transistors. Despite the pace of change and variability in the fields of informatics, electronics and computer engineering, certain fundamental digital design concepts apply consistently throughout. CS310 students will gain both the relevant theoretical understanding and have a chance to apply it in practice designing, simulating, troubleshooting and optimizing their own combinational and sequential logic circuits. The module concludes with a discussion on system level organization and architecture of modern computing devices, as well as an introduction to programming with Assembly. This module builds on knowledge and skills acquired in CS105 – Introduction to Programming I.

3. Aims of the module

Upon successful completion of the module students be able to:

- Understand and be able to explain the significance and function of fundamental components within a typical modern computing device (processor, memory, I/O, operating system), their interconnections with each other and the outside world.
- Comprehend and follow the data flow through the internal structure of a digital microprocessor.
- Understand the importance and function of logic gates as primary building components in digital design.
- Analyse combinational digital circuits and optimize them using Karnaugh maps.
- Be able to design, simulate, troubleshoot and optimize their own combinational and sequential digital logic circuits.
- Recognize and understand basic Assembly language and Machine Code.
- Understand and follow the compilation and execution of high-level programs all the way down to hardware level, through a series of computation steps occurring at various system levels.

4. Pre-requisite modules or specified entry requirements

CS105

5. Is the module compensatable?

N/A

8. Indicative content.

- Logic gates
- Digital building blocks
- Basic Boolean algebra
- Combinational logic
- Combinational optimization: Karnaugh map analysis
- Digital arithmetic circuits
- Sequential logic: flip-flops
- Registers
- Asynchronous and synchronous counters
- Finite state machines
- Assembly language and machine code
- Microarchitecture
- Memory and I/O systems
- Computing device system level architecture

Module title	COMPUTER SCIENCE 312 – Database Management Systems		
Module tutor	Mr. Christos Christodoulou	Level	5
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules

The purpose of COMP SCI 312 is to offer a systematic coverage of modern Database Computing theory and technology. Topics include Relational Algebra, Data Modelling, Database Design, Client-Server Database Management Systems, Interface Design, trends in Database Systems, combination of Object Oriented Modelling and Relational Databases.

This is a module in continuance of the CS 205 Business Data and it educates students how to create and maintain a fully functional relational database. This knowledge will be applied on CS 325, CS412, CS 422 and CS 444 where students are required to create and/or alter various databases, used along for programming assignments.

3. Aims of the module

The aims of this module are to:

Teach students what Client-Server Database Management System is, and

To use simple and advanced SQL along with PL/SQL programming features such as IF statements, loops, stored functions, procedures, tables, cursors, packages, triggers

To create and maintain an oracle database.

Microsoft Access and/or SQL Navigator for browsing objects and databases.

ERDPlus is used for ERD's.

Apex, SQL Plus and SQL Navigator are used as user interface of the oracle database

Students develop technical, analytical, and business skills that support the pursuit of professional careers and advanced computer science study.

4. Pre-requisite modules or specified entry requirements

CS 205 or permission by the Department.

5. Is the module compensatable?

N/A

8. Indicative Content

The module focus is on teaching SQL and PL/SQL programming languages for Oracle databases. Advanced query capabilities and procedural constructs are described using Oracle SQL and PL/SQL. The theoretical foundation for using these capabilities is presented. Performance issues are discussed including indexing, key definitions, DE normalized databases and triggers, and data constraints. The role of application development in ease of use, query optimization, and system performance is discussed.

Module title	COMPUTER SCIENCE 321 – Operating Systems		
Module tutor	TBA	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The module deepens understanding of how contemporary computing systems are structured and, in particular, supported by an Operating System (OS). It is a culmination module within the Computing Systems programme thread.

The module follows CS230-Introduction to Systems Programming and CS310 – Computer Architecture. The module is frequently updated in view of rapid technological developments and their implications.

The module is followed by CS421 – Systems Security as well as any future module covering the subject at the advanced level.

3. Aims of the module

Operating Systems are the brain of any computing system. They handle the body/DNA (hardware) as well as behaviour (usage of system by user). Following rapid to revolutionary technological developments the field of Operating Systems also undergoes tremendous changes, which constantly evolve the conception of an OS and of course the technological challenges involved in its implementation. As such, virtualization technologies are presented, with virtual machines used in class, along with advanced virtualization techniques, such as containers. The effects of the OS architecture and how the OS implementation affects computer system security is also covered. Finally, cloud services are presented and utilized as yet another method to implement an OS.

The module aims at outlining the role of an OS in a diachronic way while comparing and contrasting design choices spanning the evolution of the field. It aims at defining fundamental needs that a von Neumann machine has from the Operating System in order to be functional, optimal and attractive to the user without compromising system integrity or security.

The module explains Operating Systems architecture and examines trade-offs involved in different, evolving systems. It further examines diachronic as well as contemporary issues involved in Operating System design by comparing and contrasting relevant design and algorithmic choices.

The module involves lab work: Communication with the OS at a low level via a Linux shell and programming tasks addressing aspects of Operating System design and implementation.

4. Pre-requisite modules or specified entry requirements

CS 215, CS230, CS 310, STAT 210 or permission by the Department

5. Is the module compensatable?

N/A

8. Indicative content.

- Computer System Structures
- Operating System Structures
- Processes
- Threads
- CPU Scheduling
- Process Synchronization
- Deadlocks
- Memory Management
- Virtual Memory
- File-System Interface
- File-System Implementation
- I/O Systems
- Mass-Storage Structure
- Virtual Machines & virtualization
- Containers

Module title	COMPUTER SCIENCE 322 – Computer Networks I		
Module tutor	Dr. Baglavas Grigorios	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

COMP SCI 322 will address the principles, architectures and protocols that have gone into the development of modern networks from Local Area Networks to the Internet.

3. Aims of the module

This module aims to provide the student with the knowledge of how computer networks are designed, engineered and operated. This includes knowledge of the fundamental algorithms used in the management of both resources and traffic and how these algorithms may interact with application programs.

Instruction includes, but is not limited to network terminology and protocols, network standards, LANs, WANs, OSI models, cabling, cabling tools, routers, router programming, star topology, IP addressing and network security.

The student will study and design networks using Ethernet, TCP/IP Addressing Protocol, and dynamic routing.

Particular emphasis is given to the use of decision-making and problem-solving techniques in applying science, mathematics, communication, and social studies concepts to solve networking problems.

4. Pre-requisite modules or specified entry requirements

CSC 215.

5. Is the module compensatable?

N/A

8. Indicative content.

- Client-server and peer-to-peer networks, network applications and protocols, hardware and topologies, OSI model, troubleshooting
- Networks and cabling, network diagrams

- MAC Address and functionalities, TCP/IP configurations and subnetting, DNS and name resolutions, command-line troubleshooting problems
- TCP/IP core functions, communications' management, TCP/IP utilities
- Data transmission concepts and metrics, cables physical characteristics, various networking media
- Wireless networking: theoretical background and implementation
- Subnets and VLANs: subnet implementation and vlan operation
- Network security

Module title	COMPUTER SCIENCE 325 – Distributed Applications		
Module tutor	Dr. Veloudis Simeon	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules

The purpose of CS 325 is to examine in detail the software and hardware technologies prevalent in the Internet and provide an introduction to the principles and methods for creating distributed on-line client/server applications that are the basis for electronic commerce as it is conducted over the Internet. Methods and tools such as HTML, the Common Gateway Interface, PHP, database connectivity tools and MySQL are presented. Coverage is also given to emerging standards for information exchange, encryption and validation.

3. Aims of the module

The aims of this module are to teach students the technological background as well as programming languages useful in developing and deploying internet-based applications with dynamic content. Students will learn the difference between server-side and client-side programming, the overall architectural framework of such application systems and the differences between emerging distributing technologies.

4. Pre-requisite modules or specified entry requirements

CS 105

5. Is the module compensatable?

N/A

8. Indicative content.

Distributed Systems:	Introduction to Distributed Systems, Resource sharing and the Web Architectural Models, Fundamental Models Networking and InterNetworking, Network Principles, Internet Protocols Network Cases (Ethernet, Mobile, ATM)
PHP:	Variables, Data types, Operators, Expressions Control flow statements, Functions Arrays, Objects
MySQL:	MySQL Data types Basic sql statements

Transactions and Stored Procedures
Integration with PHP

Module title	COMPUTER SCIENCE 330: Introduction to Mobile Robotics		
Module tutor	Dr. Alexander Astaras	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

Autonomously navigating mobile robots face the challenge of acquiring data from their surroundings, selecting their own navigation waypoints and dynamically altering their course of action to account for obstacles, power supply restrictions and unexpected events. In this module theoretical instruction is combined with experiential learning and challenge driven software development. Students participating in this module are challenged individually and in teams to build the hardware chassis and software control algorithms for mobile robots. An introduction to robotics fundamentals is followed by guided programming for automation (C, RobotC); basic electronics circuit design and troubleshooting; microcontroller programming; sensor data acquisition algorithms; actuator control; robotic navigation and obstacle avoidance; basic sensor data fusion; and concludes with a final robotic design challenge which integrates all aforementioned knowledge and skills. This module builds on knowledge and skills acquired in CS230 – Introduction to Systems Programming.

3. Aims of the module

Students are guided through a series of lectures, experiments, design challenges and a final module project, learning to holistically design software, electronic circuits and mechanical constructions. Upon completion of the module, they are expected to be able to:

- build, program and troubleshoot mobile robots with a variety of roaming behaviours
- build and debug software to intelligently control mobile robotic systems using the Robot-C language
- design for unforeseen real-world circumstances, producing robust code and mechatronic designs which anticipate unknown changes in the robot's environment
- program a microcontroller board to automatically sample and control a variety of sensors and actuators
- design experiments which prove, characterize, extract and optimize performance parameters from each of their robot prototypes

4. Pre-requisite modules or specified entry requirements

CS230

5. Is the module compensatable?

N/A

8. Indicative content.

- Microcontroller programming using C
- Sensors and actuators
- Analogue circuit troubleshooting
- Robotic shell design using EV3
- Higher level programming for robotic control

- Mobile robotic algorithm design using Robot-C
- Mobile robotic control based on sensor data fusion
- Debugging and troubleshooting techniques
- Experimental characterization of robotic designs

Module title	COMPUTER SCIENCE 333 – Computer Networks II		
Module tutor	Dr. Chatzistavros Vagelis	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

This module is offered as a Level 6 Elective to students that have passed module CS322 (Computer Networks I). The module builds on the material learned in CS322 and expands the students' knowledge and understanding to more advanced and complex network concepts and designs. The focus is mainly routing and switching in LANs and WANs, but other major areas of networks like wireless, security and Broadband technologies. Completing CS322 and CS 333 a student is eligible to take the exam for the Cisco CCNA certification.

3. Aims of the module

The aims of the module are to expand students' knowledge in modern day networks. There are three primary goals; expand the strong foundations for Local Area Networks built in CS322, introduce Wide Areas Network Design and Technologies, and provide the fundamentals of trending networking areas including, but not limited to, wireless and security.

4. Pre-requisite modules or specified entry requirements

CSC 322

5. Is the module compensatable?

N/A

8. Indicative content.

- Switching Fundamentals
- Advanced Routing Protocols
- Wide Area Network and Broadband Technologies
- Securing Connectivity
- Monitoring and Troubleshooting Networks
- Network security

Module title	COMPUTER SCIENCE 340: Artificial Intelligence		
Module tutor	Dr. Karamouzis Stamos	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The discipline of artificial intelligence (AI) is concerned with building intelligent algorithmic agents, computing algorithms which perceive their circumstances and take actions which maximize their chance of successfully achieving their goals. This includes machine learning algorithms, intelligent agents which modify their function based on past encounters with input data, under either supervised or unsupervised training circumstances.

This module is designed for intermediate programmers who can already code using structured programming and object-oriented methodologies (in any computing language), as well as have some intermediate level understanding of data structures, search and sorting algorithms.

3. Aims of the module

This module is an introduction to the field of AI and more specifically Machine Learning, including an intensive initial introduction to the Python programming language. Indicative AI topics covered include knowledge representation, problem solving via search, logical and probabilistic reasoning and machine learning algorithms such as decision trees, neural networks, reinforcement learning and genetic algorithms.

4. Pre-requisite modules or specified entry requirements

CS215

5. Is the module compensatable?

N/A

8. Indicative content.

Introduction to the Python programming language (approx. 3 weeks)

- syntax, strings basic I/O commands
- variables, conditionals and basic control flow
- loops
- collections: lists, dictionaries, tuples, sets
- functions, libraries
- file I/O

Selected topics in Artificial Intelligence and Machine Learning (approx. 3 weeks)

- informed and uninformed search
- constraint satisfaction
- reinforcement learning
- probability
- Bayes networks
- artificial neural networks
- genetic algorithms

Module title	COMPUTER SCIENCE 412: Object Oriented Design Patterns		
Module tutor	TBD	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The module revisits Object-Oriented (OO) application design and development methodology at the senior level, examining its effectiveness in the software development life cycle, and the facilitation of rapid application development through software reuse and adoption of OO Design Patterns. It presupposes the knowledge earned through the introductory line of the Programming Fundamentals programme thread and follows level 5 modules relating to Data Modelling (CS 312) and Systems Design (CS450). Additionally, CSC 325 (Distributed Systems) is a prerequisite concerning web deployment technologies.

The module mostly emphasizes the employment of OO concepts in multi-layered architectures that include logic, data, and user experience (presentation) layers. It is of general enough nature for a level 6 module as the core OO are applicable to a wide range of software applications and problem domains. Additionally, it expands to the MVC architectural pattern and service-oriented architectures. It discusses the applicability of OO in future intelligent software applications, explaining terms from the Artificial Intelligence (AI) and Internet of Everything (IoE) domains, while revisits existing data-driven systems like Enterprise Resource Planning (ERP) and web applications.

3. Aims of the module

Major aims of the module are, to teach Object Oriented Design and Development (OODD) for ad hoc and reusable/scalable class design, and to review the OODD methodology through specific source code paradigms. The target is to provide a clear understanding for the student, by experiencing the OO concepts in actual software implementation. In parallel, it presents the necessity of OODD for building reliable and cost-effective enterprise-level applications and the tools it provides for tackling complexity. This module will establish a link between UML formality and language specific OO implementation and will illustrate the use of OO Design Patterns for specific application development needs.

It aims to cover diverse development scenarios with a single programming language and a common framework that supports all aspects of OO development, while using an integrated-development environment (IDE) to accelerate the learning curve. The selection of C# with .NET framework can be used for the development of desktop, mobile, web and service applications, with a similar syntax to Java and the easy-to-use Visual Studio IDE. As a secondary gain, the student will experience business-oriented software development tools and processes, while building the ability to quickly learn new programming languages and frameworks, a useful skill for a software development career.

Modern software engineering considers all three pillars of Information Security in the design and development of OO applications. The module aims to familiarize the student with OO practices that increase the application security and overall quality. For Confidentiality, students must design proper encapsulation and member visibilities to prevent data leakage between objects. Organizing objects in tiered (layered) architectures, restricts unwanted object interactions, notably the objects that implement the interaction with the users cannot directly access data or other core objects. For Integrity, the module aims to focus on input validation and sanitization that prevents invalid data entry and maliciously crafted input that attempts unauthorized data changes. For Availability, use of exception objects in error trapping prevents unexpected termination of the application and provides detailed logging that is useful for post-mortem examination and digital forensics. The students learn how automatic memory management via Garbage Collection (GC) in a modern OO application, prevents buffer overflows, that could allow arbitrary code execution and takeover of the host system.

4. Pre-requisite modules or specified entry requirements

CS 215, CS 312, CS325 or permission by the Department.

5. Is the module compensatable?

N/A

8. Indicative content.

- Review of Object-Oriented Concepts
- Advanced Object-Oriented Concepts and introduction to Design Patterns
- Design Patterns and Class Design guidelines
- Mastering Inheritance and Composition
- Frameworks and Reuse: Designing with Interfaces and Abstract Classes
- Designing with Interfaces and Abstract Classes
- Creating Object Models
- Objects and Portable Data: XML and JSON
- Persistent Objects: Serialization, Marshalling, and Relational Databases
- Objects in Web Services, Mobile Apps, and Hybrids
- Model, View and Controller issues of class design
- SQL injection and similar cyber security threats

Module title	COMPUTER SCIENCE 421 – Computer Systems Security		
Module tutor	Dr. Veloudis Simeon	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The module examines security issues in networked and non-networked environments. It is a senior-level module (level 6) for the Computing Systems programme thread. It follows CS321 – Operating Systems and CS322 – Network Operating Systems and Administration. The module provides the theoretical background and practical tools so that using the provided framework existing and future security threats can be analyzed and guarded against.

3. Aims of the module

The module aims at engaging a student's critical thinking in analyzing security threat scenarios and providing mitigation strategies. The theoretical and practical background concerning issues of security in modern, networked and non-networked systems is provided first. Then, the state of the art approaches are covered, focusing on current best practices. The module relies heavily on case studies and articles on recent news, so it is both current and relevant.

4. Pre-requisite modules or specified entry requirements

CSC 321, CSC 322 or permission by the Department.

5. Is the module compensatable?

N/A

8. Indicative content

- Securing data at rest and data in transit:
 - Essential Encryption Algorithms
 - Key management and credentials
 - Steganography and watermarking
- Human psychology
- Physical layouts
- Network security (network segmentation, VLAN, VPNs, jump servers, firewalls)
- Network Monitoring (HIDS, NIDS, CMDB, application-level firewalls, honeypots)
- Compliance (regional laws affecting audits & network design)

• Virtualization and security • System Security Policies and Best Practices • Threat models • Software development ○ Agile Development ○ Coding practices ○ Software release practices ○ DevOps • Cloud Computing security considerations			
Module title	COMPUTER SCIENCE 422: Advanced DBMS		
Module tutor	Mr. Christos Christodoulou	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules	
The module expands and deepens understanding of DBMS extending beyond a first year of exposure to the fundamentals. It extends CS312, which has provided the foundations on SQL and PL/SQL. Theoretical issues are examined with the intention of performance optimisation. The module aims at better equipping programme graduates towards the competitive DB market.	
3. Aims of the module	
This module focuses on creating and manipulating databases using SQL and PL/SQL programming languages for Oracle databases. Advanced query capabilities and procedural constructs are described using SQL and PL/SQL. The theoretical foundation for using these capabilities is presented. Performance issues are discussed including indexing, key definitions, and data constraints. The role of application development in ease of use, query optimization, and system performance is discussed. The module aims to teach students to use advanced SQL statements and PL/SQL programming features such as IF statements, Loops, Stored Functions/Procedures, Tables, Cursors, Stored Packages, Stored Triggers and creating and maintaining various databases. SmartDraw and Designer of Oracle is used for ERD's. APEX, SQL Plus and SQL Navigator, SQL Server Management Studio are used as user interface of the databases.	
4. Pre-requisite modules or specified entry requirements	
CS 312	

5. Is the module compensatable?
N/A

8. Indicative content.	
ERD and UML Modelling	
Practical Database Design Methods and use of	
Indexing Structures for Database Files	
Practical Database Design and Tuning	
Database Security and Authorization	
Enhanced Data Models (Triggers)	
Distributed Databases and Client-Server Architectures	
Emerging Technologies: XML and Internet Databases	
Data mining Concepts	

Emerging Database Technologies & Apps

Module Outline:

- Chapter 4:** ERD and UML Modelling (Read Chapter 3 as review)
Chapter 12: Practical Database Design Methods and use of UML
Chapter 14: Indexing Structures for Database Files (Read only)
Chapter 16: Practical Database Design and Tuning
Chapter 23: Database Security and Authorization
Chapter 24: Enhanced Data Models (Triggers) (only 24.1)
Chapter 25: Distributed Databases and Client-Server Architectures
Chapter 26: Emerging Technologies: XML and Internet Databases
Chapter 27: Data mining Concepts
Chapter 29: Emerging Database Technologies & Apps (Read Only)

Module title	COMPUTER SCIENCE 443 - Thesis I		
Module tutor	Dr. Alexander Astaras	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The module is the second half of a year-long capstone project, concluding the students' four-year learning experience in the Computer Science and Business & Computing study programs. It is designed to foster research, autonomy and synthesis of concepts and skills acquired in all other modules. The first half of the capstone project (CS443) is devoted to research/analysis and design, while the second semester counterpart (CS444) places emphasis on implementation, experimental validation, thesis writing and final project presentation.

3. Aims of the module

To provide students with an opportunity to work in a guided but increasingly independent fashion, to explore a particular problem in depth, to make practical use of principles, techniques and methodologies acquired elsewhere in the module. To challenge students to form a scientific thesis, carry out a sustained piece of individual work to prove or disprove it, and to present their project work in a dissertation. To enhance communication skills, both oral and written.

4. Pre-requisite modules or specified entry requirements

CS312, CS450

5. Is the module compensatable?

N/A

8. Indicative content.

The module deals with the definition and formal proposal phase of a major Computer Science and/or Business Computing IT project. It involves learning to brainstorm for project topic ideas, filter and prioritize them, develop a thesis statement, build a brief project proposal description, seek a faculty member to act as a supervisor for the capstone project, write a thesis proposal, design a poster and deliver a final slide presentation outlining the proposed project.

Module title	COMPUTER SCIENCE 444 – Thesis II		
Module tutor	Project supervisors (various faculty)	Level	6
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale of the module within the degree scheme/Prerequisites/other entry requirements

The module is the second half of a year-long capstone project, concluding the students' four-year learning experience in the Computer Science and Business & Computing study programs. It is designed to foster research, autonomy and synthesis of concepts and skills acquired in all other modules. The first half of the capstone project (CS443) is devoted to research/analysis and design, while the second semester counterpart (CS444) places emphasis on implementation, experimental validation, thesis writing and final project presentation.

3. Aims of the module

To provide students with an opportunity to work in a guided but increasingly independent fashion, to explore a particular problem in depth, to make practical use of principles, techniques and methodologies acquired elsewhere in the module. To challenge students to form a scientific thesis, carry out a sustained piece of individual work to prove or disprove it, and to present their project work in a dissertation. To enhance communication skills, both oral and written.

4. Pre-requisite modules or specified entry requirements

CS 443

5. Is the module compensatable?

N/A

8. Indicative content.

The module deals with the development, experimental validation, thesis document writing and presentation phase of a major Computer Science and/or Business Computing IT project. It involves learning to brainstorm for project development solutions, filter and prioritize them in consultation with the project supervisor, organize and implement development, troubleshoot, build a proof-of-concept prototype, plan validation experiments, write a thesis document which provides a scientific literature context and outlines originality, design a poster and deliver a final slide presentation describing all capstone project work.

1. Factual information

Module title	COMPUTER SCIENCE 450 - Systems Analysis and Design		
Module tutor	Mr. Chris Christodoulou	Level	5
Module type	Taught: Lecture/guided discussion	Credit value	15
Mode of delivery	100% face-to-face		
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours		

2. Rationale for the module and its links with other modules

The module serves as a capstone for the Junior year, aiming to unify all prior knowledge from the viewpoint of Systems Analysis and Design. As students have already been exposed to various aspects of computer systems, the module introduces them to the development life cycle of real-world, professional applications.

The module introduces the waterfall model for system/application development and the formal tools employed in its various stages with emphasis in prototyping, system implementation and testing.

Students entering the module are expected to have adequate knowledge of data modelling (CS205, CS312), hardware (CS310). The knowledge acquired in this module, will be applied on CS443 and CS444 where students are required to research and create a capstone project.

3. Aims of the module

The module introduces the waterfall model for system/application development and the formal tools employed in its various stages. The objectives of the module are to:

- Provide formal tools for functional and non-functional requirements collection and documentation (ERD, UML, DFD, STD's)
- Define the role of the systems analyst and designer.
- Build project management and interpersonal communication skills that the system analyst must have.
- Explain the methodologies that are used for systems analysis and design.
- Follow through the waterfall model (and discuss deviations therefrom), presenting the relevant tools at each stage.
- Provide the problem solving background for resolving trade-offs inherent in design.
- Present principles of quality and correctness testing.
- Provide students the opportunity to work as a team of analysts and designers in a project to implement the taught methodologies.

Students develop technical, analytical and business skills that support the pursuit of professional careers and advanced computer science studies.

4. Pre-requisite modules or specified entry requirements

CS312, CS310 or permission by the Department.

5. Is the module compensatable?

N/A

8. Indicative content

The module main focus is Systems analysis where students learn problem-solving techniques to decompose a system into its component pieces for the purpose of studying how well those component parts work and interact to accomplish their purpose.

- Scope analysis and feasibility study.
- Requirements collection and formal tools (ERD, UML, DFD, STD).
- Design: trade-off analysis and formal tools for decision making.
- Implementation phase: actions and deviations from Waterfall model.
- Unit and System testing.
- Deployment and Maintenance.
- Project management throughout the cycle.

Factual information

Module title	Economics 101 Introductory Macroeconomics	Level	4
Module tutor	Dr. Ioannis Krassas	Credit value	15

Module type	Face to face Lecture/guided discussion	Notional learning hours	150
Rationale for the module and its links with other modules			
The module provides an overview of the basic economic principles and their applications to many real life situations. It previews some of the big ideas that recur throughout economics, such as opportunity cost, the tools of supply and demand. It also focus on the applications of economic theory to national policy issues such as growth, inflation, unemployment, government expenditures, taxation finance and the role of money.			
Aims of the module			
The module seeks to develop an understanding how an economy works. It enables students to get a better understanding of the world they live in. It also helps them make better decisions as individuals or future executives in any type of organization or venture. All modules are linked to economics because most decisions and policies are made within an economic framework.			
Indicative content			
Indicative Weekly Content Basics of Economics • Scarcity & The Economizing Problem • Budget Line and PPC • Opportunity Costs, Marginal Analysis, Utility & Choices • Circular Flow in an Economy • Economic Systems Expectations, Crisis , Behavioral Economics: • Evolution of Economic Expectations • Static, Adaptive Expectations • Rational Expectations, & Bounded Rationality • Economic Crises • Intro to Behavioral Economics Basic Macroeconomic Variables : • Macro introduction • GDP • Economic Growth • Inflation & Unemployment. Basic Macro Relationships: • Aggregate expenditures • Savings & Consumption Schedules • Aggregate Demand & Supply • Multiplier • Fiscal & Monetary Policy Financial Economics: • Financial Instruments • Risk and Return ideas • FV and PV models Further Topics in Macro & Revision: • Extensions of AD/AS • Stability & Economic views • International Trade • Money & The Banking System			

1. Factual information			
Module title	MATHEMATICS 120 – Calculus I		
Module tutor	Dr. Vassilis Daskalogiannis	Level	4
Module type	Taught: Lecture/discussion	Credit Value	15

Mode of delivery	100% face-to-face
Notional learning hours: 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours The OU honours degrees conform to the current European qualifications framework. This indicates how the OU credit measures against the European credit transfer system (ECTS). In essence, 60 OU credit points are the equivalent of 30 ECTS points.

2. Rationale of the course within the degree scheme/Prerequisites/other entry requirements

The purpose of this course is to give a solid foundation in Calculus concepts, tools and techniques for the student entering Science and Engineering fields.

The course covers definition, calculation, and major uses of the derivative, as well as an introduction to integration. Topics include limits; the derivative as a limit; rules for differentiation; and formulas for the derivatives of algebraic, trigonometric, and exponential/logarithmic functions. Also discusses applications of derivatives to motion, density, optimization, linear approximations, and related rates. Topics on integration include the definition of the integral as a limit of sums, anti-differentiation, the fundamental theorem of calculus, and integration by the u-substitution and substitution by parts.

The course emphasizes conceptualization, modelling, and skills. All three are of great importance. There is a concentration on multiple ways of viewing functions, on a variety of problems where more than one approach is possible, and on student activity and discussion.

3. Aims of the module

By the completion of this course it is the aim and hope of the mathematics faculty that students who work hard and apply themselves will be able to:

- help students acquire a solid foundation in Differential and Integral calculus skill and concept, in order to prepare them for other university courses that require such knowledge
- show to students how math can model and solve authentic real world problems
- enable students to develop problem-solving skills, fostering critical thinking, within a varied and interesting setting
- encourage modelling and use of mathematics in Science and Engineering fields

4. Pre-requisite courses or specified entry requirements

MATH 101

6. Indicative content

Functions and Models
Limits and Derivatives
Differentiation Rules
Applications of Differentiation
Integrals
Integration by parts

1. Factual information

Module title	MATH 220 – Discrete Mathematics		
Module tutor	Dr. Kanakoglou Konstantinos	Level	5
Module type	Taught: Lecture/discussion	Credit Value	15
Mode of delivery	100% face-to-face		

Notional learning hours 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours The OU honours degrees conform to the current European qualifications framework. This indicates how the OU credit measures against the European credit transfer system (ECTS). In essence, 60 OU credit points are the equivalent of 30 ECTS points.
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2. Rationale for the course and its links with other courses

Discrete mathematics can be defined as the study of structures consisting of a sequence of individual, separated steps. As such, they contrast with calculus, the latter describing processes which vary continuously or smoothly. If one can claim that the ideas of calculus were fundamental to the industrial revolution, then one can safely assume that the backbone of the science and technology of the computer age is discrete mathematics.

The purpose of this course is for the students to understand and use the aforementioned discrete backbones of computer science. In particular, this class is meant to introduce logic, proofs, sets, relations, functions, counting, and probability, with an emphasis on applications in computer science.

Further, this course will cover fundamental mathematical foundations required for conceiving, proving, and analyzing algorithms.

Upon completion of this course, it is the aim and hope of the mathematics faculty that students who work hard and apply themselves will be able to:

1. Become comfortable with mathematical thinking that allows them to write clean and logical proofs.
2. Learn the basic language and problem solving tools of discrete mathematics so they can use these in their further study.
3. Develop problem-solving skills, fostering critical thinking, within a varied and interesting setting.
4. Model and analyze computational processes using analytic and combinatorial methods.

3. Aims of the course

On completion of this course, students will be able to apply the methods of discrete (non- continuous) mathematics in Computer Science. They will be able to use these methods in subsequent Computer Science courses such as the design and analysis of algorithms, computability, and computer systems.

4. Pre-requisite courses or specified entry requirements

MATH 101, CS 105

6. Indicative content.

The Foundations: Logic, Sets and Functions
Basic Structures: Sets, Functions, Sequences, Sums and Matrices
Algorithms
Number Theory and Cryptography
Induction and Recursion
Counting
Discrete Probability
Advanced Counting Techniques
Relations
Graphs

1. Factual information

Module title	PRACTICUM 300 - Practicum		
Module tutor	TBD	Level	6
Module type		Credit value	15

Mode of delivery	100% face-to-face
Notional learning hours 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours The OU honours degrees conform to the current European qualifications framework. This indicates how the OU credit measures against the European credit transfer system (ECTS). In essence, 60 OU credit points are the equivalent of 30 ECTS points.

2. Rationale for the module and its links with other modules

This is a level 6 major elective module which enables students to immerse themselves in real-life contexts, collaborate with community partners and mentors, and better understand the requirements of the community engagement and professional work, where relevant. There is a focus on reflexivity, problem-solving, communication skills development, critical thinking and writing.

3. Aims of the course

The module aims to offer students experiential and service-learning experiences which bring together knowledge acquired in various modules in their field of academic studies and its applications in diverse research and practice-based environments, such as the professional setting, education, not-for-profit, and the arts sector. As such, this placement module prepares students for further independent work and gives them hands-on experience of various professional fields, better equipping them for the job market.

4. Pre-requisite courses or specified entry requirements

None

6. Indicative content, learning activities and interactions

The module is a combination of classroom sessions and fieldwork / site placement. Students' projects depend on the nature of their placements. To start with, they fill in a skills and interests questionnaire, which helps to identify placements of relevance and interest out of the options available. This will be followed by interviews / informal discussions with organization staff where required.

During the first couple of weeks students will be acquainted with their placement sites and participate in a series of workshops and lectures delivered by the tutor and/or guest speakers on a variety of issues related to the practice of their subject area: from skills development (e.g. time management skills, team building, professional communication, adaptability and readiness at the workplace) to ethical issues in work, research and principles in community participation.

In the remainder of the term students will work on their placement projects. Location and schedules will be agreed jointly with their allocated mentors. The key principle underlying students' activities is the co-construction of knowledge through student-mentor-tutor collaboration. Such a participatory approach enables a shared, co-experienced understanding of the issues explored. Whilst the allocated mentors will support and guide students throughout, the latter are expected to demonstrate independent thinking, use of own initiative and responsiveness to the needs of the community / organization, so that they produce a piece of work that benefits them and falls within the aims and learning outcomes of their programme.

Further information about the placements, including ethical and academic considerations, is available on moodle / ACTivity and the module handbook.

1. Factual information

Module title	STATISTICS 210 – Introduction to Statistics with R		
Module tutor	Dr. Chatzistavros Evangelos	Level	4
Module type	Taught: Lecture/discussion	ECTS credits	7.5
Mode of	100% face-to-face		

delivery	
Notional learning hours 150	Face to Face delivery (lectures, guided discussions, guest speakers): 44 hours, Tutorials and Office hours: 11 hours, Completion of regular homework, preparation for submitting assessments, study for Exams: 95 hours The OU honors degrees conform to the current European qualifications framework. This indicates how the OU credit measures against the European credit transfer system (ECTS). In essence, 60 OU credit points are the equivalent of 30 ECTS points.

2. Rationale of the course within the degree scheme/Prerequisites/other entry requirements
An application-oriented introduction to modern statistical analysis using R software that includes: study design, exploratory data analysis; random variables; probability models and sampling distributions; point and interval estimates; hypothesis tests and linear regression. A wide variety of applications are used.
3. Aims of the course
This course is an introduction to descriptive and inferential statistical methods. Students will master problem solving using both manual computations and R statistical software. The student will learn to formulate research questions, design data collection to answer the question, collect and analyze the data and interpret and report the results. The course aims at the following: • Give the student the statistical skills necessary to meet the needs of business and the real- world decision-making problems. • Effectively communicate the results of a statistical analysis both orally and in writing. • Provide fundamental statistical knowledge and skills required for a higher-level course in related fields. • Analyze data using R software

4. Pre-requisite courses or specified entry requirements
Math 101

6. Indicative content.										
<table border="1"> <tr><td>Data and Statistics</td></tr> <tr><td>Descriptive Statistics</td></tr> <tr><td>Descriptive Statistics: Numerical Measures</td></tr> <tr><td>Probability</td></tr> <tr><td>Discrete Probability Distributions</td></tr> <tr><td>Continuous Probability Distributions</td></tr> <tr><td>Sampling Distributions</td></tr> <tr><td>Interval Estimation</td></tr> <tr><td>Hypothesis Testing</td></tr> <tr><td>Linear Regression</td></tr> </table>	Data and Statistics	Descriptive Statistics	Descriptive Statistics: Numerical Measures	Probability	Discrete Probability Distributions	Continuous Probability Distributions	Sampling Distributions	Interval Estimation	Hypothesis Testing	Linear Regression
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Linear Regression										

9. STUDENT SUPPORT, GUIDANCE AND ADVICE

ACADEMIC ADVISING AND MENTORING

During the first 2 weeks of classes, students will be assigned the faculty member who will be their Academic Advisor for their first year at AAU and, in most cases, until graduation. The Academic Advisor helps students to plan their overall program of studies, as well as to select modules each semester. Advisors also provide information about AAU academic and support services, assist students in

addressing problems in particular modules within a given semester, and offer ongoing advice concerning the students' long-term academic and career goals.

THE LEARNING HUB

The Learning Hub strives to help students to become strong, independent learners through a variety of services. AAU's Learning Hub is located on the upper floor of the library. Students are invited to meet with the tutors and receive assistance with writing projects as well as mathematics and science needs. Consultation is offered on one to one basis on prearranged meetings, or drop in sessions, as well as via e-mail.

10. OPPORTUNITIES FOR PERSONAL DEVELOPMENT PLANNING

CAREER SERVICES AND GUIDANCE

The Career Services Office maintains strong connections with local businesses to:

- Provide students with internship and employment opportunities.
- Facilitate students' transition into the workforce after graduation.

Career Services organizes annual Career Fairs featuring businesses and non-governmental organizations (NGOs) from Greece and abroad.

- The Career Services Office supports students and alumni in all stages of job searching, including:
 - Resume preparation
- Writing cover letters
- Job market insights (e.g., available positions, company policies, hiring processes, salaries, etc.)
- Interview techniques

Career advisors offer one-on-one sessions to:

- Guide students on career planning and job market trends.
- Help students prepare effectively for job applications and interviews.

Additionally, Career Services meets with company representatives to:

- Identify business needs.

Match students' skills and interests with job opportunities.

INTERNSHIPS

The Career Office gives special emphasis to students' internships, both with local and international organizations. Every academic term there is a visiting program with local organizations with internship opportunities, all relevant to the academic programmes and focusing on enhancing in-class learning. Apart from the on-campus recruiting, the office coordinates a series of internship opportunities with organizations located in other cities or even abroad, either with on-site placement or remote work. The Job Board and Facebook Career Group help disseminate the internship opportunities, while the Career Workshops (resume writing, cover letter preparation, mock interviews) prepare students for claiming those opportunities.

11. FACILITIES AND SERVICES

BISSELL LIBRARY - GENERAL INFORMATION

The Bissell Library offers a vast collection of books in print, electronic books and videos. Already one of the largest English language libraries in Greece, its collection is rapidly growing into a space designed to accommodate the institution's needs for years to come. The collection includes subscriptions to periodicals in hard copy as well as access to numerous full-text scholarly journals, magazines, and newspapers.

The Bissell Library offers, to currently enrolled students, on site and remote access to research databases to support inquiry and research. Business databases include Ebsco's Business Source Elite, Regional Business News, Hoover's, and ProQuest ABI Inform Global. Databases for research include: Academic Search Premier, E-books collection, Encyclopaedia Britannica, ERIC, GreenFILE, Columbia International Affairs Online (CIAO), JSTOR, Oxford English Dictionary and Oxford Music Online. We also subscribe to the Ebsco A-Z service, providing listing of all the electronic resources accessible from the library. The EBSCO Discovery Service TM brings together the most comprehensive content providing to users an easy, yet powerful means of accessing all of the library's information resources through a single search. Library users can search the catalog, databases or the Internet through public access terminals available on both floors of the library. Network ports are available for laptops and the entire building is Wi-Fi enabled.

COMPUTING SERVICES & NETWORKING FACILITIES

AAU has state of the art computer infrastructure and facilities. All computer facilities are connected to a high-speed campus network, which is based on fiber optic cables connecting all buildings. In addition, a large high speed wireless network access (WI-FI) covers large areas of the campus giving students the ability to use the school's resources or access the internet on their laptop.

Many high-speed servers are present in the network infrastructure, along with Intel® Core™ latest technology workstations, connected to the Internet, available to students in multiple laboratories.

The laboratories are used both as general access and instructional computer labs. They are equipped with data projectors and black and white or color laser printers. All stations are networked with full Internet Access and run the latest software such as MS office, Oracle, Power-builder, Visible Analyst, Java, Visual Basic, 3-D Max, Adobe Photoshop, Adobe CS Production Studio Premium, Macromedia Studio, Macromedia Authorware, PanaView Image Assembler, Mathematica Player, Minitab, MathCad, Daedalus, etc.

SCIENCE LABORATORIES

All science modules are accompanied by laboratory work. The purpose of the laboratories offered is to expose students to hands-on experience regarding concepts and principles learned in classroom. The university's Science Facilities are located on the ground floor of Constantinidis Hall. The facilities include three laboratories (Biology/Ecology, Physics and Chemistry).

12. DETERMINATION OF RESULTS

MINIMUM REQUIREMENTS FOR PASS

To obtain an Open University award, students are required to complete all parts of the programme's approved assessment and comply with all regulations relating to their programme of study. The minimum aggregate pass marks for The Open University validated awards are 40% for undergraduate programmes.

These minima apply to assessments, modules, stages and qualifications.

DETERMINING MODULE OUTCOMES

The overall module mark or grade shall be determined as set out in the assessment strategy detailed in the module specification and published in the Programme Handbook.

A student who passes a module shall be awarded the credit for that module. The amount of credit for each module shall be set out in the programme specification and published in the Programme Handbook.

In order to pass a module a student must achieve the requirement of the module as set out in the module specification and published in the Programme Handbook.

Where a student is registered only for a module (rather than a qualification) the resit will apply.

BACHELOR HONOURS DEGREE CLASSIFICATION

Classification of bachelor degrees will be based on the average mark across all modules within Stage 3 (usually Credit Level 6) and Stage 2 (usually Credit Level 5) at a ratio of 2:1 respectively unless the requirements of a Professional, Statutory and Regulatory Body (PSRB) state otherwise.

Honours degrees are classified as:

- First class Aggregate mark of 70% or above
- Upper Second class Aggregate mark between 60% and 69%
- Lower Second class Aggregate mark between 50% and 59%
- Third class Aggregate mark between 40% and 49%

Where students have directly entered a Qualification Level 6 top-up award (e.g. having previously undertaken a Higher National Diploma (HND) or Foundation Degree (FD) award) the calculation for the honours classification will be based solely on all credits at Credit Level 6.

Performance in work for which an award of credit for prior learning has been made is not taken into account in the calculation of the final award.

Where the final result of the classification calculation creates a mark of 0.5% or greater this will be rounded up to the next full percentage point (e.g. 69.5% is rounded to 70%; 59.5% to 60%; and so on). Where the calculation creates a mark below 0.5% this will be rounded down to the next full percentage point (e.g. 69.4% is rounded to 69%; 59.4% to 59%; and so on). For the purposes of rounding up or down, only the first decimal place is used.

13. ASSESSMENT AND PROGRESSION REGULATIONS

SUBMISSION OF ASSESSED WORK

Work submitted for a summative assessment component cannot be amended after submission, or re submitted.

Student requests for extensions to assessment deadlines will not be approved unless made in accordance with published partner institution guidelines as approved by The Open University.

Where coursework is submitted late and there are no accepted extenuating circumstances it will be penalized in line with the following tariff:

Submission within 6 working days: a 10% reduction for each working day late down to the 40% pass mark and no further.

Submission that is late by 7 or more working days: submission refused, mark of 0. A working day is defined by the partner and submission after the deadline will be assumed to be the next working day.

Academic staff must submit their marks and feedback within 3 working days from the day the assessment was submitted.

ASSESSMENT SCORES

All undergraduate assessment will be marked on a percentage scale of 0-100.

Grade Description	UK points
Excellent	70-100
Very Good (high)	65-69
Very Good (low)	60-64
Good (high)	55-59
Good (low)	50-54
Satisfactory (high)	45-49
Satisfactory (low)	40-44
Fail	0-39

The final grade for an individual assessment component will be determined after completion of a quality assurance process (e.g. moderation, remarking) as detailed in the partner institution's OU approved policy for moderation.

Where the result of the assessment calculation creates a mark of 0.5% or greater this will be rounded up to the next full percentage point (e.g. 69.5% is rounded to 70; 59.5% to 60%; and so on). Where the calculation creates a mark below 0.5% this will be rounded down to the next full percentage point (e.g. 69.4% is rounded to 69%; 59.4% to 59%; and so on). For the purposes of rounding up or down, only the first decimal place is used.

DETERMINING PROGRESSION AND QUALIFICATION OUTCOMES

The paths through which students are required to progress through the programme, and the elements identified as compulsory or optional, are set out in the programme specification and approved in the validation process.

Pathways through any programmes offered by partner institutions may require students to complete prerequisite or co-requisite modules.

STAGE REQUIREMENTS

Each of the stages of an undergraduate programme is expected to consist of a total of 120 credits.

In cases where Programmes are not divided into stages (for example, most postgraduate programmes and undergraduate programmes of 120 credits or less) the provisions below apply to the whole programme.

In order to complete and pass a stage of a programme, a student must acquire the total credit set out in the programme specification at the approved qualification level for the award, or have been exempted through advanced standing, or through the implementation of the processes covering extenuating circumstances (see Section F).

The credit value of each module contributing to a stage determines its weighting in the aggregation of credit for a stage.

Where a student fails a module, the following may apply in the first instance:

- Resit, a second attempt at an assessment component following a failure at first attempt.

RESIT PROVISION

Resit provision is subject to all the following conditions:

- The maximum number of retakes allowed in a programme leading to an Open University award is 10.
- A student who does not complete the resit by the date specified shall not progress on the programme, except in cases where the process for allowing extenuating circumstances has been followed.
- Resits can only take place after the meeting of the Board of Examiners or following agreement by the Chair and the External Examiner of the Board.
- A student who successfully completes any required resits within a module shall be awarded the credit for the module and the result capped at the minimum pass mark for the module.

14. DISSERTATIONS AND PROJECTS

HOW THE BISSELL LIBRARY SUPPORTS STUDENTS WITH THEIR THESES

The Bissell library in its effort to complement and facilitate the educational process and the curriculum always strives to provide the best services possible safeguarding that all students across all Schools receive the same learning experience and support, as well as fair access to all available resources and services. More specifically, when it comes to the writing up stage of their theses, the Bissell Library provides the following Resources and Support Services.

Resources :

- A collection of theses writing books, academic writing and general study skills.
- Subject guides provide a thematic information gateway of trustworthy information resources (e-journals, databases, etc.) to assist students in their quest for information gathering for their theses.
- The website of the Library, attempts to familiarize and provide introductory guidance on how to use various online tools such as Zotero, EasyBib and Diigo, which can become indispensable tools when it comes managing information and bookmarks, and citing resources.
- Guides have been composed to assist students with the OU Harvard referencing style (available on the library website)
- The Library in conjunction with all Schools has streamlined the procedure of gathering all theses so as to develop in the near future an Institutional Repository. In the meantime students can drop in any time and can have access to study good examples of theses on site.
- Last but not least, a plethora of printed material in a variety of subjects is also available to students.
- The students are able to ask for Interlibrary loans of journal articles not available online. The service is provided by the British Library. They are also able to suggest books relevant to their research to the library to buy.

Support Services:

- The allocation of two Academic Liaison Librarians allows for better communication among students, academic staff and the Library.
- Information Literacy lessons conducted by the Academic Liaison Librarians offer students a reminder of research, evaluation and referencing skills, part of their coursework, to support them in their projects. These sessions include: techniques on how to locate formal and informal information sources on subjects, evaluation of resources, plagiarism and paraphrasing, and referencing.
- Finally, the Academic Liaison Librarians provide one to one support on how to search, evaluate and locate materials and referencing, either in drop in sessions or after appointments.

15. OTHER INSTITUTIONAL POLICIES AND REGULATIONS

ACADEMIC MISCONDUCT

An academic offence (or breach of academic integrity) includes any action or behavior likely to confer an unfair advantage, whether by advantaging the alleged offender or by disadvantaging another or others. Examples of such misconduct are plagiarism, collusion, cheating, impersonation, use of inadmissible material and disruptive behavior.

Responsibilities

- **Students:** Students are responsible for upholding academic integrity and reporting any instances of academic misconduct. They must familiarize themselves with the institution's Academic Misconduct Policy and adhere to it.
- **Faculty and Staff:** Faculty and staff are responsible for preventing, detecting, and addressing academic misconduct. They are expected to educate students on academic integrity, report any suspected cases, and follow the procedures outlined in this policy.
- **Procedures Reporting Suspected Misconduct:** Charges against a student for violating academic integrity may originate from any source: a faculty member, an administrator, a staff member, a

fellow student, or from the community at large. Anyone who suspects academic misconduct must report it to the appropriate academic authority (Department Chair, Associate Deans) and provide evidence. In case of plagiarism, it should also be reported to the student electronically through the AAU's ERP system. In this way, students are immediately notified. Students may also report academic misconduct by another student to the faculty or staff member responsible for the module.

- Investigation: Upon receiving a report of academic misconduct, the academic authority shall forward the case to the Academic Standards and Performance Committee (ASPC). If a member of the Committee originates the charge, then that member will be excluded from the decision-making process, and any other process related to the case.

The ASPC will either itself investigate the charge or establish from its own membership a panel to conduct the investigation. In establishing whether a breach of academic integrity has occurred, the Committee should consider oral and/or written evidence supplied by the individual(s) making the charge and the alleged offender. The alleged offender shall have the right to appear before the Committee.

Determination and Consequences

After the investigation, the ASPC shall determine whether academic misconduct occurred. If academic misconduct is confirmed, sanctions will be imposed based on the severity and frequency of the offense.

The following list of sanctions is indicative and can be imposed by majority vote of the Committee:

- Admonishment Letter (or Letter of Warning): The student is advised in writing that their behavior violates rules of academic and/or personal integrity and that a recurrence will lead to more serious sanctions. The Committee will deliberate on whether the letter should or should not appear in the student's file permanently or for a lesser period of time.
- First Offense File: The student's name and a description of the offense is filed in a shared electronic folder, accessible by the Provost, the Deans, the department chairs and the area coordinators. Second offenses automatically result in a hearing.
- Disciplinary Probation: The student is advised in writing that their behavior violates rules on academic and/or personal integrity and is given a probationary period (to be decided upon by the Committee) to show by good behavior that a more stringent penalty should not be imposed. During the period of the probation, the student is required to terminate association with all extra-curricular activities and resign from any student office.
- Suspension: The student's relationship with the ULE will be discontinued until the end of the semester or term. The student will forfeit any fees involved with the ULE.
- Dismissal: The student's relationship with the ULE will be terminated

EXTENUATING CIRCUMSTANCES

The Open University recognizes that students may suffer from a sudden illness, or other serious and unforeseen event or set of circumstances, which adversely affects their ability to complete an assessment, or the results they obtain for an assessment. In such cases the partner institution's extenuating circumstances procedures will be applied, as approved in institutional review.

A student who is prevented from attending or completing a formal assessment component or who feels that their performance would be (or has been) seriously impaired by extenuating circumstances, may submit a deferral request to the AS&PC.

MITIGATING CIRCUMSTANCES

The following regulations distinguish between factors or circumstances which were known to the student in advance of taking an assessment and which affect his or her ability to attend an examination or submit work by the published deadline, and those which have not impaired the student's ability to attend for examination or meet a deadline for the submission of work but which may have affected his or her performance. In all cases, it is the responsibility of the student to ensure the timely disclosure of any factors or circumstances which may affect the assessment of his or her learning and responsibility for the consideration of these factors and circumstances will lie with the AS&PC.

Students whose circumstances may affect (or may have affected) their ability to meet a program's assessment requirements must submit a completed Mitigating Circumstances Extension Form together with verifiable documentation to the Registrar's Office. This form can be completed electronically or in person and may, if necessary, be signed retrospectively.

In the case of factors or circumstances which were known to the student in advance of taking an assessment and which affect his or her ability to attend an examination or submit work by the published deadline:

- the AS&PC will consider the evidence submitted by the student;
- if the mitigating circumstances are accepted by the Committee it will determine the extension to be granted to the student or, in the case of examinations, the date on which the student shall be assessed; in such cases the grades will not be capped at 40%.
- the Chair of the Board of Examiners, the Registrar and the appropriate department head/area coordinator will be informed of the Committee's decision.
- The student will have the right to apply for a further extension, or for a rescheduling of an examination, if the mitigating circumstances persist.

In the case of factors or circumstances having prevented a student from attending for examination or meeting a deadline for the submission of work but which may have affected his or her performance:

- the AS&PC will review the evidence submitted by the student and make a recommendation for consideration by the appropriate Board of Examiners;

the Board of Examiners is responsible for considering that action that it should take in the light of the for the consideration of these factors and circumstances will lie with the AS&PC.

Students whose circumstances may affect (or may have affected) their ability to meet a program's assessment requirements must submit a completed Mitigating Circumstances Extension Form together with verifiable documentation to the Registrar's Office. This form can be completed electronically or in person and may, if necessary, be signed retrospectively.

In the case of factors or circumstances which were known to the student in advance of taking an assessment and which affect his or her ability to attend an examination or submit work by the published deadline:

- the AS&PC will consider the evidence submitted by the student;

- if the mitigating circumstances are accepted by the Committee it will determine the extension to be granted to the student or, in the case of examinations, the date on which the student shall be assessed; in such cases the grades will not be capped at 40%.
- the Chair of the Board of Examiners, the Registrar and the appropriate department head/area coordinator will be informed of the Committee's decision.
- The student will have the right to apply for a further extension, or for a rescheduling of an examination, if the mitigating circumstances persist.

In the case of factors or circumstances having prevented a student from attending for examination or meeting a deadline for the submission of work but which may have affected his or her performance:

- the AS&PC will review the evidence submitted by the student and make a recommendation for consideration by the appropriate Board of Examiners;
- the Board of Examiners is responsible for considering that action that it should take in the light of the recommendations of the AS&PC;
- the actions available to the Board of Examiners include: the deferral of an assessment to a later date; compensation for the failure in a module; agreement that the student should either retake the module or be reassessed with the grade achieved being recorded in the student's transcript and therefore contributing to the classification of the award; and, exceptionally a decision that the student be assigned a higher grade for the module or modules on which his or her performance has been affected.

Students are responsible for ensuring that the partner institution is notified of any extenuating circumstances at the time they occur and for supplying supporting documentation by the published deadline.

If a student is unable to attend an examination or other assessment event because of extenuating circumstances, they must inform the Partner institution as soon as possible and provide supporting evidence before published deadlines or within 7 calendar days, whichever is sooner. If a student cannot submit evidence by published deadlines, they must submit details of the extenuating circumstances with an indication that evidence will be submitted within 7 calendar days. Medical evidence submitted in support of a claim for extenuating circumstances should be provided by a qualified medical practitioner.

Upon receipt of recommendations from the panel or body responsible for investigating extenuating circumstances, the Board of Examiners, or its subsidiary board, will decide whether to:

- provide a student with the opportunity to take the affected assessment(s) as if for the first time i.e. a 'sit' or 'submit', allowing them to be given the full marks achieved for the examination or assessment, rather than imposing a cap;
- waive late submission penalties;
- determine that there is sufficient evidence of the achievement of the intended learning outcomes from other pieces of assessment in the module(s) for an overall mark to be derived;
- note the accepted extenuation for the module(s) and recommend that it is taken into account at the point of award and classification.

The Board of Examiners, depending on the circumstances, may exercise discretion in deciding on the particular form any reassessment should take. Options are a viva voce examination, additional assessment tasks designed to show whether the student has satisfied the programme learning outcomes, review of previous work, or normal assessment at the next available opportunity. The

student will not be put in a position of unfair advantage or disadvantage: the aim will be to enable the student to be assessed on equal terms with their cohort.

The module marks released following the meeting of the Board of Examiners should clearly identify results where extenuation has been considered and applied.

- If a student fails, without good cause, to provide the responsible body with information about extenuating circumstances within the timescales specified in the partner institution policy, the responsible body has authority to reject the request on those grounds.

16. STUDENT PARTICIPATION AND EVALUATION

STUDENT PARTICIPATION

A member of the Student Government Association (SGA) must be present at all meetings of the Academic Standards and Performance Committee (ASPC) of the college, and participate in the discussions and voting for all cases examined. Furthermore, there are scheduled weekly meetings between the Associate Dean of Students and the SGA, where students present their views on the operation and development of the College. In addition, AAU may invite students to Academic Council meetings, where they can express their views and opinions to the top-level administration. The SGA is also involved in co-organizing major on-campus events.

MODULE EVALUATION

Module evaluation is conducted through the student evaluation forms. These forms measure the teaching quality and assessment methods, learning materials, delivery methods, module objectives, thought-provoking activities, comprehension of the subject matter, grading, degree of intellectual challenge and stimulation and draw comparisons with other modules.

The collection of student feedback is made at the office of the Associate Dean of Students, who has the general overview of the procedure. Then, modules are classified according to the programme they belong, and the feedback is sent to the corresponding department head. The results are also forwarded to the individual instructors. The outcomes of module evaluations and measures that need to be taken to improve student experience in future offerings of the modules are discussed with the academic teams.