



UNIVERSITY OF NICOSIA
Department of Computer Science

Student Handbook

Department of Computer Science
School of Sciences

Academic Year 2012-2013

Contents

1.	About this Booklet	4
2.	Studying Computer Science.....	4
3.	Equal Opportunities Policy	5
4.	Faculty of the Computer Science Program	5
5.	Studying in the BSc. of Computer Science at the University of Nicosia (UNic).....	7
5.1.	The Academic Advisor	7
5.2.	The Academic Path	7
5.3.	The BSc in Computer Science Path.....	8
5.4.	Planning Your Studies	11
5.5.	Major Courses, Prerequisites and Offerings	12
5.6.	Suggested Semester Breakdown	16
6.	Short Description of Major Courses.....	17
6.1.	Section A – Major Requirements	17
6.2.	Section B – Major Electives	23
6.3.	Section C – Math Electives	28
7.	Check List.....	30

Foreword

Dear Student,

The Computer Science field is a very active and volatile one. It is subject to constant change due to new developments in technology and/or application of this technology in new areas. Our academic program in Computer Science aims to provide you with a solid foundation in the field of Computer Science and prepare you to become an effective computer professional. The program is based on both theory and practice with emphasis given to the concepts and techniques necessary for the design and development of advanced computer systems. The program conforms to the guidelines set by international Computer Science Organizations such as the British Computer Society and the Association for Computing Machinery. It includes a considerable number of major and elective courses of theoretical and applied nature. Finally, it is supported by state-of-the-art hardware and software facilities.

The aims of our accredited four year BSc in Computer Science program are achieved by including in the program several computer courses, as well as courses in mathematics, social science, and other areas. This builds program diversity and contributes to a foundation of a broad range of skills for positions in business and industry. Program aims are currently supported by the following computer scientists' concerns for:

- ◆ the organization and interaction of devices constituting an information processing system
- ◆ the development and implementation of computer-based systems
- ◆ the application of these systems and theories of computer science to other disciplines especially business, management and science in general.

The faculty members supporting our programs are experienced and highly qualified lecturers and many of them have industry-related background and/or have worked abroad in other Universities. Almost all hold Ph.D. degrees in a broad range of computer science specializations. Most of the lecturers are also actively engaged in research and have published and still publish papers in international scientific journals and conference proceedings. Moreover, they maintain research collaboration links with other universities abroad such as the University of London (Birkbeck College), Ohio State University, New Jersey Institute of Technology, University of Alberta (Canada), Georgia Institute of Technology, London Metropolitan, Washington State University, University of North Carolina (Charlotte), Aristotle University of Thessaloniki, University of Louisiana, University of Catania (Italy), University of Poznan (Poland), University of Paris I, University of Metz (France) and the University of Tsukuba (Japan). Research work is carried out in a number of research areas including Relational and Object-Oriented Databases, CASE Tools, Computer Graphics, Computer Architecture, Parallel Processing, Artificial Intelligence, Neural Networks, Networks, Network Security and Trust, Statistical Methods, Applied Mathematics, Medical Statistics, Knowledge Management, I.T. in Education and Data Mining.

Upon graduation you will be ready for an entry level position in industry and for further graduate studies. Today, there is a huge demand for qualified computing personnel in the commercial and administrative fields. With our degree you will be looking at opportunities in programming, systems analysis and design, software engineering, Internet and Multimedia development, networking, as well as in any other computer-related jobs. By including another foreign language in your Elective courses you will open career pathways with multi-national companies in Cyprus and abroad.

During your studies, you will be assigned an academic advisor who will help you choose courses, listen to your academic problems and provide solutions to them, advice you on study skills, help you develop as an independent learner and help you achieve your educational aims and goals. In addition to your academic advisor, the Head of the Computer Science Department, the Associate Head, the Program Co-ordinator and the rest of the faculty are available for any information or help you may require.

The Computer Science faculty welcomes you to the University of Nicosia and to the Computer Science program, wishing you every success in your studies and a rewarding and enjoyable time at our university.

Computer Science Faculty
University of Nicosia

1. About this Booklet

This booklet has been written to provide you with a detailed guide to the Computer Science Program, the Program Path, the Course Syllabi and the Faculty teaching in the Program. Please read it carefully to familiarise yourself with the Program. You should also consult the Academic Policies booklet and any other leaflet distributed by the Department of Academic Affairs in order to familiarise yourself with the academic rules, policies and regulations of the College.

2. Studying Computer Science

The nature of the Computer Science Program and its courses requires that students spend considerable amount of their studying time in the computer laboratories, as well as in the library.

Computer Laboratories:

Several computer laboratories are operating around the campus of the University of Nicosia. The main ones are situated in the Main building, in rooms A19, A20, B101, B111, B113, and B117.

Computer Science Lab: B111
Other Labs: A19, A20, B101, B113, and B117

You are strongly advised to utilise these resources in the best possible way, since it is very important that you gain practical experience. Please consult the laboratories' timetables displayed on each laboratory door in order to find out the times during which the labs are free and available for use.

Computer Center Support:

The labs are managed by specialists and during the peak hours of operation trained assistants selected from senior Computer Science and Computer Engineering students, are on duty. The combination of excellent educational technology and professional management makes the learning environment rich and dynamic. If you require any further help, please contact the Computer Center Office which operates a users' support group and is located in Room B105 of the Main building.

Computer Center Office: B105

Library:

The University of Nicosia Library provide Computer Science students with the opportunity to have access to a large and wide range of computer books, magazines, journals and other related written material. Moreover, you can access CD-ROM and on-line databases of information, as well as audio and video tapes. You are strongly advised to take advantage of the resources available in our Library and use them extensively during your time at the University.

3. Equal Opportunities Policy

The Department of Computer Science and the University of Nicosia at large realise and accept the need for an Equal Opportunities Policy. We are committed to providing equal opportunities to all students. We are committed to operating and functioning in such a way that no direct or indirect discrimination occurs regarding the admission, advising and assessment of students and the treatment of any individual on grounds of gender, race, sexuality, age, nationality, colour, special needs, social and economic background, marital status, political or social or religious belief. We strongly oppose to any practices which, directly or indirectly promote any kind of discrimination and result in individuals not being treated solely on the basis of their merits and abilities. To this end, we will resolve any such practices and will refer serious cases to the Disciplinary Committee.

4. Faculty of the Computer Science Program

You can contact us by personal visit to our office, by telephone or by e-mail. Please note that each faculty member displays every semester on the door of his/her office the "Student Consultation Hours" during which he/she is available to see students and provide any help and assistance they may need. Alternative meetings may be arranged outside these hours by contacting the lecturer. Please feel free to come and see us since we are here to provide you with the best support needed to complete your studies.

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5. Studying in the BSc. of Computer Science at the University of Nicosia (UNic)

Your Academic Path shows the courses that you must complete. These are grouped in categories which are referred to as “Requirements” or “Electives”. In every category there is a minimum and a maximum number of credit hours that must be satisfied.

In order to plan your studies, you have to study carefully your Academic Path and consult with your Academic Advisor and the Department of Academic Affairs before choosing your courses.

5.1. The Academic Advisor

Academic Advisors in the Office of Admissions are available to help you plan your studies and choose your courses. Don't hesitate to contact them if you have any question:

Office of Admissions
Office: Europa Building, Ground floor
Tel: 22841524
Email : unic.enrol.dept@unic.ac.cy

5.2. The Academic Path

The main categories in your Academic Path are:

Major Requirements	Required Computer courses which you must take. You need to take <u>all</u> the courses in this category.
Major Electives	Additional Computer courses which you can take. Minimum of 6 courses required.
Math Electives	Mathematics courses.
Science And Engineering Electives	Include biology, chemistry, physics and engineering courses.
Business Electives	Business and MIS courses
Language Expression	English and communication courses.
Liberal Arts Electives	Art, foreign languages, music, philosophy, political science, psychology, public relations, sociology, religion and theatre courses.

The BSc Computer Science path is given in the next pages.

5.3. The BSc in Computer Science Path

Computer Science (4 years, Bachelor of Science)

Min. Cr. 120 (ECTS 240)

Path Notes: R = Required Course

Section A	Major Requirements	ECTS: 116	Credits: 58	
Courses		ECTS	Credit	Teaching
ECE-110	Digital Systems	6	3	4
COMP-111	Programming Principles I	6	3	4
COMP-112	Software Development Lab I	4	2	2
COMP-113	Programming Principles II	6	3	4
COMP-114	Software Development Lab II	4	2	2
COMP-201	Systems Analysis and Design	6	3	3
COMP-211	Data Structures	6	3	3
COMP-212	Object-Oriented Programming	6	3	4
COMP-302	Database Management Systems	6	3	3
COMP-321	Theory of Computation	6	3	3
COMP-335	Computer Organization and Architecture	6	3	4
COMP-354	Operating Systems	6	3	3
COMP-358	Networks and Data Communication	6	3	3
COMP-370	Algorithms	6	3	3
COMP-401	Software Engineering	6	3	3
COMP-405	Artificial Intelligence	6	3	3
COMP-421	Compiler Design	6	3	3
COMP-431	Computer Security	6	3	3
COMP-498	Final Year Project I	6	3	0
COMP-499	Final Year Project II	6	3	0
Totals for Section:		116	58	57

Section B	Major Electives	ECTS: 36-60	Credits: 18-30	
Courses		ECTS	Credit	Teaching
COMP-213	Visual Programming	6	3	3
COMP-254	Assembly Language Programming	6	3	3
COMP-263	Human Computer Interaction	6	3	3
COMP-303	Data Mining	6	3	3
COMP-320	Computer Graphics	6	3	3
COMP-399	Special Topics in Computer Science	6	3	3
COMP-402	Advanced Databases	6	3	3
COMP-411	Programming Languages	6	3	3
COMP-412	Internet Programming	6	3	3
COMP-413	Systems Programming	6	3	3
COMP-414	Embedded Systems	6	3	3
COMP-415	Distributed Systems	6	3	3
COMP-416	Concurrent Programming	6	3	3
COMP-432	Network Security	6	3	3
COMP-435	Advanced Computer Architecture	6	3	3
COMP-458	Network Protocols	6	3	3
COMP-470	Internet Technologies	6	3	3
Totals for Section:		102	51	51

Section C Math, Science and Engineering Electives ECTS: 34-60 Credits: 17-30

Courses			ECTS	Credit	Teaching
MATH-101	Discrete Mathematics	R	6	3	3
MATH-190	Calculus I	R	8	4	4
MATH-191	Calculus II	R	8	4	4
MATH-225	Probability and Statistics	R	6	3	3
MATH-270	Calculus III		8	4	4
MATH-280	Linear Algebra	R	6	3	3
MATH-330	Ordinary Differential Equations		6	3	3
MATH-399	Special Topics in Mathematics		6	3	3
BIOL-110	Elements of Biology		6	3	3
CHEM-104	Intro. Organic & Biological Chemistry		6	3	3
ECE-100	Electric Circuits I		6	3	3
ECE-210	Electronics I		6	3	3
PHYS-110	Elements of Physics		6	3	3
PHYS-150	General Physics I		8	4	5
PHYS-160	General Physics II		8	4	5
Totals for Section:			100	50	52

Section D Business Electives ECTS: 6-24 Credits: 3-12

Courses			ECTS	Credit	Teaching
BUS-111	Accounting		6	3	3
BADM-234	Organizational Behavior		6	3	3
ECON-200	Fundamental Economics		6	3	3
MGT-281	Introduction to Management		6	3	3
MGT-370	Management of Innovation and Technology		6	3	3
MIS-215	Project Management		6	3	3
MIS-253	Database Applications Development		6	3	3
MIS-351	Information Systems Concepts		6	3	3
MIS-390	E-business		6	3	3
MIS-456	Management of Information Systems		6	3	3
MIS-460	Supply Chain Management		6	3	3
MKTG-291	Marketing		6	3	3
Totals for Section:			72	36	36

Section E Language Expression ECTS: 12-30 Credits: 6-15

Note Placement in the English courses is done on the basis of a Placement Test or tests such as TOEFL or GCE.

Courses			ECTS	Credit	Teaching
BADM-231	Business Communications		6	3	3
BADM-332	Technical Writing and Research	R	6	3	3
BENG-100	College English		6	3	6
COMM-200	Business & Professional Communication		6	3	3
ENGL-100	Basic Writing		6	3	3
ENGL-101	English Composition	R	6	3	3
Totals for Section:			36	18	21

Section F Liberal Arts Electives		ECTS: 6-24	Credits: 3-12	
Courses		ECTS	Credit	Teaching
ANTH-105	Cultural Anthropology	6	3	3
DES-110	Introduction to the Visual Arts	6	3	3
ENGL-102	Western World Literature & Composition	6	3	3
EUS-103	Modern European History and Politics	6	3	3
FREN-101	French Language and Culture I	6	3	3
FREN-102	French Language and Culture II	6	3	3
GERM-101	German Language and Culture I	6	3	3
GERM-102	German Language and Culture II	6	3	3
HIST-201	World History to 1500	6	3	3
HIST-257	Modern Cypriot History and Politics	6	3	3
HIST-265	The US and World History Since 1945	6	3	3
ITAL-101	Italian Language and Culture I	6	3	3
ITAL-102	Italian Language and Culture II	6	3	3
PHIL-101	Introduction to Philosophy	6	3	3
PHIL-120	Ethics	6	3	3
PSY-110	General Psychology I	6	3	3
PSY-111	General Psychology II	6	3	3
PSY-210	Social Psychology	6	3	3
RUS-101	Russian Language and Culture I	6	3	3
RUS-102	Russian Language and Culture II	6	3	3
SOC-101	Principles of Sociology	6	3	3
Totals for Section:		126	63	63
Total Credits:		552	276	280

5.4. Planning Your Studies

Choosing the courses that you will study during the various semesters of your academic years requires some planning. In order to plan properly your studies, you need to consult with your Academic Advisor and the Department of Academic Affairs. You should also get familiar with your Academic Path and the semester timetable of courses (available before the semester starts from the Department of Academic Affairs).

Your advisor and the Department of Academic Affairs will help you choose the courses for each semester. You are strongly advised to go prepared to your consultation meetings. This preparation will result in shortening the time needed for taking decisions (saving your time, as well as saving your advisor's time). More importantly, the preparation process will help you develop your initiative and contribute to your development as an independent learner. One of our institutional aims is to help you develop your personality, mature as a person and become an independent, self-confident, decisive and educated person. Your initiative in learning, working, taking decisions and becoming an active member of our Program and University will be greatly appreciated.

Once you have completed thirty (30) undergraduate ECTS credits with a Cumulative Point Average (CPA) of 1.9 and above, and have no overdue instalments of fees with the Finance Department from the previous semester, and no pending obligations with any other Department of the University, you may also select to use on-line pre-registration.

All courses are taught in English. Additionally the first two years of the program study are usually also offered in Greek. Thus, the Greek speaking students may select to take some courses in Greek while they follow their English language courses in order that they improve the level of their English so as to be able to attend the remaining courses of the program.

We present you in the next pages a recommended breakdown of the Bachelor Degree academic years, in terms of the Computer Science and Mathematics courses that you could take. Please bear in mind, that each recommended option is one of the various possible options that you have. The choice of courses and the sequence in which you take them depends also on your proficiency in the English language (and the relevant courses that you have to take), your mathematical background (and the relevant courses that you have to take) and finally on any preferences you may have choosing courses based on their timetable hours.

5.5. Major Courses, Prerequisites and Offerings

The codes F, S appearing in the following table indicate the semester when courses are **usually** offered. Please consult with the Department of Academic Affairs of your campus for information about the timetable of courses. The Prerequisite of a course gives the required course(s) that you should take in order to be able to take a course.

Table Notes: F = Fall Semester, S = Spring Semester, ✓ = Fall and/or Spring Semester

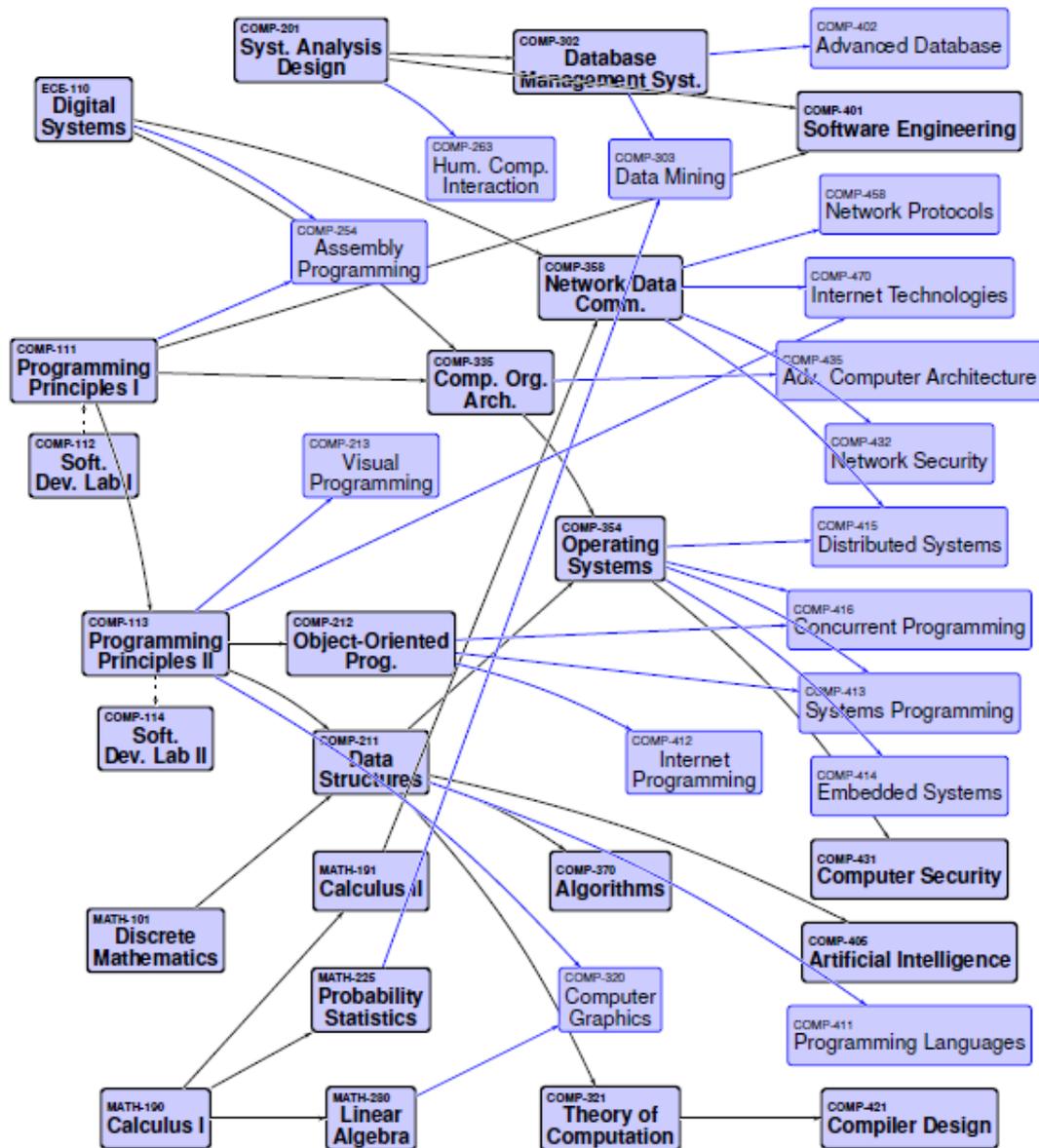
Academic Standing: Freshman (First year) = 0-32 credits / 0-59 ECTS
 Sophomore (Second year) = 33-64 credits / 60-119 ECTS
 Junior (Third year) = 65-96 credits / 120-179 ECTS
 Senior (Fourth year) = 97 credits and above / 180 ECTS and above

Section A - Major Requirements					
Course Code	Course	Semester Offered	Also in Greek	Offered in evening	Prerequisite
ECE-110	Digital Systems	F and S	F and S	F and S	None
COMP-111	Programming Principles I	F and S	F and S	F and S	None
COMP-112	Software Development Lab I	F and S	✓	✓	PRE OR CO-REQUISITE: COMP-111
COMP-113	Programming Principles II	F and S	F and S	F and S	COMP-111
COMP-114	Software Development Lab II	S			PRE OR CO-REQUISITE: COMP-113
COMP-201	Systems Analysis and Design	F and S	✓	F	Sophomore Standing
COMP-211	Data Structures	F and S	✓	F	COMP-113, MATH-101
COMP-212	Object-Oriented Programming	F	✓		COMP-113
COMP-302	Database Management Systems	F and S		S	COMP-201, Junior Standing
COMP-321	Theory of Computation	F and S			COMP-211
COMP-335	Computer Organization and Architecture	F and S		F	COMP-111, ECE-110
COMP-354	Operating Systems	S		S	COMP-211, COMP-335
COMP-358	Networks and Data Communication	S		S	ECE-110, MATH-191
COMP-370	Algorithms	F and S		S	COMP-211
COMP-401	Software Engineering	S		S	COMP-111, COMP-201, Junior Standing
COMP-405	Artificial Intelligence	F		F	COMP-211, Senior Standing
COMP-421	Compiler Design	F		F	COMP-321
COMP-431	Computer Security	S		S	COMP-354
COMP-498	Final Year Project I	F and S			Senior Standing Consent of Department
COMP-499	Final Year Project II	F and S			COMP-498

Section B – Major Electives		
Course Code	Course	Prerequisite
COMP-213	Visual Programming	COMP-113
COMP-254	Assembly Programming	COMP-111, ECE-110
COMP-263	Human Computer Interaction	COMP-201
COMP-303	Data Mining	COMP-302, MATH-225
COMP-320	Computer Graphics	COMP-113, MATH-280
COMP-399	Special Topics in Computer Science	Determined by Topic
COMP-402	Advanced Databases	COMP-302
COMP-411	Programming Languages	COMP-211
COMP-412	Internet Programming	Any Programming Language, Junior Standing
COMP-413	Systems Programming	COMP-212, COMP-354
COMP-414	Embedded Systems	COMP-354
COMP-415	Distributed Systems	COMP-354, COMP-358
COMP-416	Concurrent Programming	COMP-212, COMP-354
COMP-432	Network Security	COMP-358
COMP-435	Advanced Computer Architecture	COMP-335
COMP-458	Network Protocols	COMP-358
COMP-470	Internet Technologies	COMP-113, COMP-358

Section C – Math, Science and Engineering Electives					
Course Code	Course	Semester Offered	Also in Greek	Offered in evening	Prerequisite
MATH-101	Discrete Mathematics	F and S	✓	F and S	None
MATH-190	Calculus I	F and S	✓	F and S	Math-160 OR Mathematics Placement Test
MATH-191	Calculus II	F and S	✓	F and S	MATH-190
MATH-225	Probability And Statistics	F and S			MATH-190
MATH-270	Calculus III	S			MATH-191
MATH-280	Linear Algebra	F and S	✓	F	MATH-190
MATH-330	Ordinary Differential Equations	S			MATH-191
MATH-399	Special Topics in Mathematics				Determined by Topic
BIOL-110	Elements of Biology				None
CHEM-104	Intro. Organic & Biological Chemistry				None
ECE-100	Electric Circuits I				None
ECE-210	Electronics I				ECE-100

PHYS-110	Elements of Physics				None
PHYS-150	General Physics I				MATH-190
PHYS-160	General Physics II				PHYS-150



- A solid arrow \longrightarrow indicates a required prerequisite, a dotted arrow $\cdots\rightarrow$ indicates a corequisite (to be taken before or concurrently).
- Core courses are in **bold** boxes; other courses (i.e.,electives) are in **light** boxes.

5.6. Suggested Semester Breakdown

The semester breakdown which follows has been prepared according to the pre-, co-requisites of courses and when each course is offered. Our aim was to come up with a suggestion that could also serve the evening students, to the extent that this was possible. Students with more flexible hours have of course many more options in taking the courses. The choice of courses and the sequence in which you take them depends also on your proficiency in the English language (and the relevant courses that you have to take), your mathematical background (and the relevant courses that you have to take) and finally on any preferences you may have choosing courses based on their timetable hours.

YEAR 1			
Fall Semester	ECTS	Spring Semester	ECTS
ECE-110 DIGITAL SYSTEMS	6	COMP-113 PROGRAMMING PRINCIPLES II	6
COMP-111 PROGRAMMING PRINCIPLES I	6	COMP-114 SOFTWARE DEVELOPMENT LAB II	4
COMP-112 SOFTWARE DEVELOPMENT LAB I	4	MATH-191 CALCULUS II	8
MATH-101 DISCRETE MATHEMATICS	6	ENGL-101 ENGLISH COMPOSITION	6
MATH-190 CALCULUS I	8	ELECTIVE (MAJOR, MATH, SCIENCE, ENGINEERING)	6
Total Credits	30	Total Credits	30
Total ECTS for Year 1 : 60			

YEAR 2			
Fall Semester	ECTS	Spring Semester	ECTS
COMP-201 SYSTEMS ANALYSIS AND DESIGN	6	MATH-225 PROBABILITY AND STATISTICS	6
COMP-211 DATA STRUCTURES	6	MATH-280 LINEAR ALGEBRA	6
COMP-212 OBJECT ORIENTED PROGRAMMING	6	BADM-332 TECHNICAL WRITING & RESEARCH	6
BUSINESS / LIBERAL ART ELECTIVE	6	MAJOR ELECTIVE	6
BUSINESS / LIBERAL ART ELECTIVE	6	MAJOR ELECTIVE	6
Total Credits	30	Total Credits	30
Total ECTS for Year 2 : 60			

YEAR 3			
Fall Semester	ECTS	Spring Semester	ECTS
COMP-321 THEORY OF COMPUTATION	6	COMP-302 DATABASE MANAGEMENT SYSTEMS	6
COMP-335 COMPUTER ORG. AND ARCHITECTURE	6	COMP-354 OPERATING SYSTEMS	6
MAJOR ELECTIVE	6	COMP-358 NETWORKS AND DATA COMMUNICATION	6
MAJOR ELECTIVE	6	COMP-370 ALGORITHMS	6
ANY ELECTIVE (MAJOR, MATH, ...)	6	MAJOR ELECTIVE	6
Total Credits	30	Total Credits	30
Total ECTS for Year 3 : 60			

YEAR 4			
Fall Semester	ECTS	Spring Semester	ECTS
COMP-405 ARTIFICIAL INTELLIGENCE	6	COMP-401 SOFTWARE ENGINEERING	6
COMP-421 COMPILER DESIGN	6	COMP-431 COMPUTER SECURITY	6
COMP-498 FINAL YEAR PROJECT I	6	COMP-499 FINAL YEAR PROJECT II	6
MAJOR ELECTIVE	6	ANY ELECTIVE (MAJOR, MATH, ...)	6
ANY ELECTIVE (MAJOR, MATH, ...)	6	ANY ELECTIVE (MAJOR, MATH, ...)	6
Total Credits	30	Total Credits	30
Total ECTS for Year 4 : 60			

6. Short Description of Major Courses

Following is a short description of each course's objectives. The name of the faculty appearing on the same line as the course title is the leader of the course. Please note that other faculty may also be teaching the same course.

6.1. Section A – Major Requirements

ECE-110 Digital Systems

Dr. A. Polycarpou

The main objectives of the course are to:

- Introduce fundamental digital concepts and principles that are commonly used in the analysis and design of digital systems
- Introduce and explain the operation of fundamental logic gates that comprise the building blocks of complex digital circuits
- Present and demonstrate through examples techniques and mathematical models/tools that are used in the analysis and design of logic circuits
- Design and test fundamental digital blocks that perform specific functions
- Introduce the concept of system-in-a-chip through the use of PLDs and FPGAs
- Use fundamental digital blocks for the design of more complex digital systems including registers, sequential counters, memories, A/D and D/A converters

PREREQUISITE(S): None

COMP-111 Programming Principles I

Dr. A. Savva

The main objectives of the course are to:

- Introduce students to structured programming by means of the syntax and semantics of a structured high-level programming language.
- Provide students a good working knowledge of a programming language. This includes programming constructs such as expressions, selection statements, loops, functions and arrays.
- Provide practical experience in problem solving, coding, debugging, and testing.
- Guide the student in order to develop good programming practices.
- Obtain a foundation that will allow the student to pursue more advanced programming topics.

PREREQUISITE(S): None

COMP-112 Software Development Lab I

Dr. A. Savva

The main objectives of the course are to:

- introduce to the students good software development practices
- provide practical experience in developing software with appropriate comments and comment tags
- provide practical experience in developing readable, maintainable, robust, and secure source code
- provide practical experience in developing software which checks all function arguments and the function return argument
- provide practical experience in developing function/method tests and automatic test suites
- introduce tools/environments which automatically can run test suites
- introduce tools which automatically check the quality of the code
- introduce environments which provide code check-style

PREREQUISITE(S) OR COREQUISITE: COMP-111

COMP-113 Programming Principles II**Dr. A. Stassopoulou**

The main objectives of the course are to:

- Build on the knowledge already acquired in Programming I, by focusing on the more advanced concepts of procedural programming.
- Enable the students to develop algorithmic thinking and problem solving.
- Introduce dynamic memory allocation.
- Provide practical experience in manipulating data strings, arrays, pointers and structures.
- Provide the fundamentals of recursion.
- Introduce students to I/O file stream and data files.
- Introduce Object-Oriented Programming.

PREREQUISITE(S): COMP-111

COMP-114 Software Development Lab II**Dr. H. Gjermundrød**

The main objectives of the course are to:

- Introduce and provide experience in using tools for source code version management
- Familiarize students with tools for software bug tracking in order to gain experience in using such tools.
- Cover in details the full life-cycle of software development: commit code, test and submit bug reports, provide patches and patch the source code
- Introduce and use tools for builds and installers for various platforms

COREQUISITE: COMP-113

COMP-201 Systems Analysis and Design**Ms. V. Stylianou**

The main objectives of the course are:

- Address different types of organizational needs which may undertake some information technology-based solution.
- Introduce the various aspects of feasibility and their use in the determination of project feasibility.
- Examine several development methodologies which may be used to manage the software development process. Such methodologies include: Structured Systems Analysis and Design Methodology (SSADM) and the Systems Development Life Cycle (SDLC); agile and iterative methodologies including Prototyping, Rapid Application Development and other agile software development approaches; Object-Oriented Analysis and Design using UML and other methodologies.
- Examine a variety of information gathering techniques and their potential use.
- Cover formal project management techniques and team dynamics.
- Identify, evaluate (Cost vs. Benefit analysis), and suggest different systems acquisition alternatives.
- Briefly discuss security, validation, and privacy issues relating to data maintenance and accessibility.
- Address the objectives for effective design (input, output, database, data entry procedures). Introduce human-computer interaction and incorporate its principles in the software design.
- Discuss successful information system implementation by addressing training requirements and possibilities, physical conversion strategies, and the need for evaluation.

PREREQUISITE(S): Sophomore Standing

COMP-211 Data Structures**Dr. A. Savva**

The main objectives of the course are to:

- Introduce students to Abstract Data Types (ADT).
- Provide practical experience to advanced programming techniques and data structures including tables, linked lists, queues and stacks.
- Introduce students to advance recursion such as the divide-and-conquer and backtracking.
- Obtain a foundation that will allow students to use storage media; methods of representing structured data; and techniques for operating on data structures.
- Introduce students to searching and sorting algorithms.
- Introduce students to Binary Trees and graphs.

PREREQUISITE(S): COMP-113, MATH-101

COMP-212 Object Oriented Programming**Dr. C. Mavromoustakis**

The main objectives of the course are to:

- Learn the basic principles of the object-oriented programming with specific reference to the Java programming language.
- Penetrate and acquire the knowledge for simple object-oriented concepts and for more complex (private classes, objects, encapsulation, inheritance and polymorphism).
- Identify the key Object Oriented Concepts (OO Concepts) required to build an OO system.
- Learn different Object Oriented Analysis and Design approaches (OOAD) to architect and build object oriented systems.
- Develop a way for efficient algorithmic thinking and problem solving using the object-oriented paradigm with the UML (Unified Modelling Language).
- Learn the Java graphical user interfaces (GUI) and the associated libraries of SDK/Sun.
- Describe, plan, and build simple applications using the concepts of object-oriented programming in the Java context. Student will be enforced to adopt object-oriented methods to a variety of problems, with emphasis on the Reverse Engineering (RE) paradigm.

PREREQUISITE(S): COMP-113

COMP-302 Database Management Systems**Ms V. Stylianou**

The main objectives of the course are:

- Examine databases, database management systems and their role in the organization.
- Follow historically the development of database management systems until present time.
- Analyze data models and data modelling techniques.
- Cover relational database design by converting a conceptual data model to a database schema.
- Explain normalization and use it to design normalized relational databases.
- Cover Structured Query Language's (SQL), data definition (DDL), data manipulation (DML), and data control (DCL) components.
- Introduce data and database administration functions.
- Examine on-line transaction processing (OLTP) and its role in the business environment.
- Introduce business intelligence to include on-line analytic processing (OLAP), data warehousing, data mining.

PREREQUISITE(S): COMP-201, Junior Standing

COMP-321 Theory of Computation**Dr. F. Domenach**

The main objectives of the course are to:

- Be familiar with the basic theoretical principles in Computer Science
- Know various types of finite automata
- Be familiar with formal definitions of programming languages and their connection with finite automata
- Have learnt material on Turing machines and computability
- Have a deeper theoretical understanding of algorithmic complexity classes.

PREREQUISITE(S): COMP-211

COMP-335 Comp. Organization and Architecture**Dr. C. Christou**

The main objectives of the course are to:

- Understand performance metrics
- Be introduced to an instruction set architecture
- Understand instruction types, register sets, addressing modes
- Understand flow-of-control, subroutine call and return mechanisms
- Understand the Structure of machine-level programs
- Be introduced to Arithmetic of Computers
- Construct an ALU
- Implement in hardware several Instructions like Addition, Subtraction, Multiplication and Division
- Be introduced to pipelining and memory hierarchy

PREREQUISITE(S): COMP-111, ECE-110

COMP-354 Operating Systems**Dr. H. Gjermundrød**

The main objectives of the course are to:

- Introduce Operating System structuring methods like monolithic, layered, modular, and micro-kernel models.
- Provide deep knowledge of abstractions, processes, and resources.
- Make aware the concept of protection through the transition between user and system (kernel) mode.
- Thoroughly discuss OS structures like ready list, process control blocks, and so forth.
- Provide deep knowledge of the concept of processes and threads.
- Thoroughly discuss dispatching, context switching, pre-emptive, and non-pre-emptive scheduling.
- Cover in detail the “mutual exclusion” problem and some solutions.
- Provide knowledge of deadlock including: causes, conditions, and prevention.
- Provide knowledge of synchronization models and mechanisms (semaphores, monitors, condition variables, rendezvous).
- Explain in detail physical memory, memory management hardware, paging, and virtual memory.

PREREQUISITE(S): COMP-211, COMP-335

COMP-358 Networks and Data Communication**Dr. C. Mavromoustakis**

The main objectives of the course are to:

- Learn the basic computer networking technologies and the required infrastructure which comprises the key steps involved in the communication process.
- Establish a solid knowledge of the layered approach that makes design, implementation and operation of extensive networks possible. To learn the 7-layer OSI network model (each layer and its responsibilities) and identify as well as realize the definitions explored in the TCP/IP suite of protocols and the networked applications supported by it.
- Acquire the knowledge of the basic protocols involved in wired/wireless communication process. These include the characteristics of the required

infrastructure for Local Area Networks (MAC-CSMA-CD/Ethernet, Token Ring, FDDI, and others), and for Wide Area Networks using the TCP/IP, UDP/IP.

- Link different network performance concepts and traffic issues for Quality of Service (QoS) in broadband communication.
- Learn the basic design principles of wired and wireless communication networks. Moreover to learn the way to model and analyze the structural performance for some commonly used network architectures.

PREREQUISITE(S): ECE-110, MATH-191

COMP-370 Algorithms

Dr. F. Domenach

The main objectives of the course are to:

- Provide understanding how to evaluate the efficiency of an algorithm
- Present a variety of techniques for designing algorithms
- Provide a wide variety of data structures and be able to use them appropriately to solve problems
- Build a foundation of fundamental algorithms

PREREQUISITE(S): COMP-211

COMP-401 Software Engineering

Dr. A. Kokkinaki

This course aims to provide students with the application of theory, knowledge, and practice to develop software systems that satisfy the requirements of users and customers in an effective and efficient way. The main objectives of this course are to:

- Describe all phases of the life cycle of a software system, including requirements analysis and specification, design, construction, testing, deployment, and operation and maintenance.
- Demonstrate tools for managing software development; analyzing and modeling software artifacts; assessing and controlling quality; and for ensuring a disciplined, controlled approach to software evolution and reuse.
- Present the “good practice” tools, methods, and approaches that are most applicable for a given development environment.

PREREQUISITE(S): COMP-201, COMP-111 and Junior Standing

COMP-405 Artificial Intelligence

Dr A. Stassopoulou

The main objectives of the course are to develop an understanding of the theory and practice of Artificial Intelligence. The course is designed to cover the fundamental issues associated with the field such as: problems and search, knowledge representation and reasoning, game playing, rule-based systems. Advanced topic areas such as probabilistic reasoning and Bayesian networks are also introduced.

PREREQUISITE(S): COMP-211 and Senior Standing

COMP-421 Compiler Design

Dr. I. Dionysiou

The main objectives of the course are to:

- Present and explain the compilation phases
- Discuss the application of regular expressions in lexical scanners
- Discuss parsing (concrete and abstract syntax, abstract syntax trees) and application of context-free grammars in recursive-descent parsing and bottom-up parsing
- Discuss declarations and types
- Provide student with knowledge on run-time environments, intermediate code representations and code generation principles

PREREQUISITE(S): COMP-321

COMP-431 Computer Security**Dr. I. Dionysiou**

The main objectives of the course are to:

- Motivate and appreciate the need for computer security and protection
- Provide student deep knowledge on computer security technology and principles, including cryptographic tools, user authentication, access control, and formal models for multilevel computer security
- Expose students to techniques to manage security of computers and users by means of contemporary host-based intrusion detection/prevention tools, physical security measures, auditing, logging
- Explain various operating systems security models, policies

PREREQUISITE(S): COMP-354

COMP-498 Final Year Project I**Ms. V. Stylianou**

The final-year project is the largest and most substantial single piece of work that students are assigned throughout their Bachelor degree. It offers the opportunity to put to practice and combine the knowledge gained from a large number of courses. Students choose a problem/topic from a list of projects offered by Computer Science faculty. Alternatively, students may propose a project of their own, according to conditions set by Final Year Project regulations.

PREREQUISITE(S): Senior Standing. Consent of Department.

COMP-499 Final Year Project II**Ms. V. Stylianou**

PREREQUISITE(S): COMP-498

6.2. Section B – Major Electives

COMP-213 Visual Programming **Dr. P. Pouyioutas**

The main objectives of the course are to:

- Develop algorithmic, object-based and event-driven thinking and problem solving skills.
- Introduce the concepts of designing a graphical user interface and associate the interface with the program code.
- Introduce the concepts and techniques of programming in general and Visual, Object-Oriented, and Event-Driven programming in a specific Visual Integrated Development Environment.
- Provide practical experience in developing programs that responds to exception conditions raised during execution.
- Introduce the basic concepts of Visual Programming, namely Controls and Constructs, Variable, Decisions, Loops, Arrays, Multi-form applications, File Handling, and integrating components like Web forms, Graphics, Animation, and Sound.

PREREQUISITE(S): COMP-113

COMP-254 Assembly Language Programming **Dr. C. Christou**

The main objectives of the course are to:

- Introduce Assembly Language Programming
- Approach programming problems with a machine-level mind set.
- Think of the CPU as an interactive tool, and to learn to monitor its operations as directly as possible
- Understand that a debugger is a programmer's best friend, not only for catching errors but to comprehend the operations of the CPU as well

PREREQUISITE(S): COMP-111, ECE-110

COMP-263 Human Computer Interaction **Ms V. Stylianou**

The main objectives of the course are:

- Provide an overview of concepts on designing Human Computer Interfaces in making computer-based systems comprehensive, friendly and usable
- Understand the theoretical dimensions of human factors involved in the acceptance of computer interfaces
- Understand the important aspects of implementation of Human Computer Interfaces
- Identify the various tools and techniques for interface design, analysis and evaluation
- Identify the impact of usable interfaces in the acceptance and performance utilization of Information Systems
- Identify the importance of working in teams and the role of each member within an interface development phase

PREREQUISITE(S): COMP-201

COMP-303 Data Mining **Dr. F. Domenach**

The main objectives of the course are to:

- Provide understanding of what is Data Mining
- Determine when and how we can use Data Mining tools
- Introduce the concepts and techniques of pre-processing of the data to be analyzed,
- Introduce the concepts and techniques of statistical methods, Decision Trees, Clustering Methods and Association Rules from data

PREREQUISITE(S): COMP-302, MATH-225

COMP-320 Computer Graphics**Dr. A. Savva**

The main objectives of the course are to:

- Introduce students to the design and construction of models that represent information in ways that support the creation and viewing of images.
- Provide practical experience to two-dimensional and three-dimensional transformations, i.e. scaling, rotations, translation, and sheering,
- Introduce students to the design of devices and techniques through which a person may interact with the model or the view.
- Introduce students to techniques for rendering a model, and the design of ways the image may be presented.
- Provide practical experience to API programming using OpenGL.
- Introduce students to a three-dimensional environment for enhancing interaction between a human user and a computer-created world.

PREREQUISITE(S): COMP-113, MATH-280

COMP-399 Special Topics in Computer Science**Dr. F. Domenach**

Special topics will be selected from the area of computer science with the intention to keep the students informed about current developments and directions in the respective field of study. The specific topic may be of mutual interest to the student and faculty member or appropriate for group study. Provided that the content of this course changes, it may be taken twice (up to a maximum of 12 ECTS).

PREREQUISITE(S): Determined by the topic. Department permission is necessary.

COMP-402 Advanced Databases**Dr. P. Pouyioutas**

The main objectives of the course are to:

- make students aware of the various database models (emphasis on post-relational models) and database systems
- provide students with deep knowledge for developing database applications and fundamental knowledge for developing web-based database applications
- cover in detail all aspects of the SQL language (including security, authorization, optimization, embedded SQL)
- thoroughly discuss the object-oriented database model, standards and languages and compare this model with the relational model
- discuss Data Warehousing, OLAP, Data Mining, Web Technology and XML
- introduce state-of-the art research in the area of databases.

PREREQUISITE(S): COMP-302

COMP-411 Programming Languages**Dr. I. Dionysiou**

The main objectives of the course are to:

- Master design language concepts such as syntax and semantics
- Provide student with deep knowledge on programming language constructs such as values, variables, and types
- Explain program execution during runtime
- Provide student with thorough knowledge on the fundamental principles for various programming paradigms, including imperative programming, object oriented programming, functional programming, logic programming, event-driven programming, and concurrent programming.

PREREQUISITE(S): COMP-211

COMP-412 Internet Programming**Dr. D. Apraksin**

The main objectives of the course are to:

- introduce a concept of WWW and the Internet
- introduce Domain Name System
- introduce and use name server configuration
- introduce and use IIS and Apache WEB servers

- introduce and use Microsoft WEB development platform
 - introduce cloud computing (Microsoft Azure)
 - obtain knowledge and practical experience of ASP.NET programming
 - obtain knowledge and practical experience of database (ADO.NET) programming
- PREREQUISITE(S): Any programming language, Junior Standing

COMP-413 Systems Programming **Dr. H. Gjermundrød**

The main objectives of the course are to:

- Introduce the UNIX operating system and the environment and tools it provides for developing system programs.
- Introduce the tools, language and OS libraries needed to develop command line applications in an effective manner
- Explain in detail structure and organization of the file system and develop applications that are using buffered and unbuffered I/O.
- Explain the concept of processes and develop applications that dynamically create processes and synchronize their interaction.
- Introduce signals and signal handlers as well as develop applications which are using signals.
- Explain the concept of multi-threaded applications and develop multi-applications that are using various synchronization mechanisms.
- Expose the students to scripting and how it can be used as simple system programs.

PREREQUISITE(S): COMP-212, COMP-354

COMP-414 Embedded Systems **Dr. H. Gjermundrød**

The main objectives of the course are to:

- Motivate the need for developing embedded system applications.
- Cover in detail the concepts of embedded systems and real-time operating system paradigms.
- Explain in the concepts of tasks, inter-process communication, synchronization, interrupts, and timers.
- Explain the presence of and describe the characteristics of latency in real-time systems.
- Expose students to industrial development environment for embedded systems and industrial real-time operating systems.
- Introduce and discuss special concerns that real-time systems present and how these concerns are addressed.

PREREQUISITE(S): COMP-354

COMP-415 Distributed Systems **Dr. C. Mavromoustakis**

The main objectives of the course are to:

- explore the basic concepts of distributed systems along with the distributed algorithm designs and implementations
- enable students to penetrate into theory of decentralized modeling and study up-to-date concepts, algorithms and internetworking issues for building modern distributed systems
- to learn about the conceptual model and the parts of a distributed system, and enable them to design and implement along with the basic requirements, a distributed infrastructure-based system
- to acquire a deep knowledge on processes, threads, virtualization, code migration, consistency and replication issues in DS
- to enable students to see from different views the DS enterprise as follows:
 - o The viewpoint of applications, i.e., what kinds of concepts and programming skills are fitted for the design of distributed systems and applications.

- The viewpoint of the system designers and of the implementers, i.e., the system layers and their mapping to the design of distributed algorithms along with their implementations.

PREREQUISITE(S): COMP-354, COMP-358

COMP-416 Concurrent Programming

Dr. H. Gjermundrød

The main objectives of the course are to:

- Introduce models, mechanisms, and techniques of concurrent programming.
- Understand when concurrent programming techniques are appropriate to use and the benefits and risks involved with choosing such an approach.
- Make aware how to create correct programs using several different concurrent programming mechanisms in different programming languages.
- Thoroughly discuss concurrent programming paradigms or patterns like threads, safety, liveness, state guarding, atomicity, and locking.
- Cover in detail object visibility and immutability as well as thread safety and confinement.
- Provide deep knowledge of handling task executing.
- Introduce and discuss concurrent programming in functional languages.

PREREQUISITE(S): COMP-212, COMP-354

COMP-432 Network Security

Dr. I. Dionysiou

The main objectives of the course are to:

- Motivate the need for network security practices in organizational units
- Provide students with deep knowledge on various concepts of classical computer and network security paradigms
- Build foundations to assess contemporary security policies and security mechanisms within organizations and illustrate the balance of the managerial and technical aspects of network security
- Expose students to current security practices that are exercised in Cypriot/International organizations

PREREQUISITE(S): COMP-358

COMP-435 Advanced Computer Architecture

Dr. C. Christou

The main objectives of the course are to provide the student with the opportunity to study high-performance and supercomputer architectures used to solve very large-scale problems and computationally intensive applications, which are not realistically solvable on typical computers.

PREREQUISITE(S): COMP-335

COMP-458 Network Protocols

Dr. C. Mavromoustakis

The main objectives of the course are to:

- Build upon the introductory material covered in COMP-358 Networks and Data Communications (Network Architectures. Layering and Protocols).
- Emphasize on network protocols instead of network architectures and include programming of networked applications.
- Cover in depth the TCP/IP suite of protocols examining IP and related protocols (ICMP, ARP), IP routing (BGP, OSPF), Mobile IP, Transport Layer protocols (TCP, UDP), and related specifications (SMTP, HTTP, DNS), IGPs, EGPs, and Routing Protocols (RIP).
- The Protocol Suite of TCP/IP (ARP/RFC 826, Reverse Address Resolution Protocol (RARP), RIP Operational Types etc.), multiservice servers using TCP/UDP, tunneling at the transport and application levels, Application level gateways, External data representation.
- Internet Protocol Version 6 (IPv6) including IPv6 routing comparison with IPv4 routing using CIDR. OSPF, RIP, IDRP, and IS-IS and modifications.

- Cover in a great extend the file P2P sharing existing protocols.
- Enable students to learn about the behavior of each examined protocol via Simulation techniques.
- Design a new protocol based on an already existing using a simulation tool/ develop a simulation in evaluating an already implemented protocol/Simulation experimental procedure/simulating a protocol based scenario.

PREREQUISITE(S): COMP-358

COMP-470 Internet Technologies

Dr. C. Mavromoustakis

The main objectives of the course are to:

- Learn about the nature of the Internet. Internet Services and Protocols. World-Wide-WEB Services.
- Sockets and Client/Server structures, N-tier architecture of the global internet. Servers and State management.
- Web usability, server configuration and server based executable and scripts.
- Thin and Thick client scripting.
- Gain knowledge about the HTTP Protocol. HTTP servers and clients, Hypertext Reference Model.
- RFC2965 - HTTP State Management Mechanism.
- Gain knowledge about the TCP/IP stack and protocols (TCP/IP Tutorial, RFC 1180) and application interface.
- Architecture of the World Wide Web. Using a Uniform Resource Identifier (URI) to Access a Resource, Representation Management, URI persistence, Linking and access control.
- Learn the Web caching and the utilizing notation currently used. Client site caching control. WEB Proxies. Web caching includes additional configuration and administration of Squid Cache.
- Web Introduction to XML & Web Technologies. Briefly cover the Web Programming: HTML, XHTML, Object Models, Styles, Dynamic content, DHTML.
- Learn about how to programming the WEB using Client scripting, JavaScript, Jscript, VB Script and demonstrate to students the Perl and ASP scripting.
- Learn about the Socket Programming (Unix, Winsock, .NET).
- Learn about the Semantic Web and enable students to perform literature research and survey on the WWW.

PREREQUISITE(S): COMP-113, COMP-358

6.3. Section C – Math Electives

MATH-101 Discrete Mathematics **Dr. G. Portides**

The course covers the fundamentals of Discrete Mathematics with emphasis on applications in computing. More specifically, the course objectives are to:

- Introduce students to mathematical reasoning, in order to formulate logical arguments and construct proofs
- Familiarize students with the basic concepts and methods of set theory, relations and functions
- Introduce students to graphical modelling of computer algorithms with specific applications

PREREQUISITE(S): None

MATH-190 Calculus I **Dr. M. Christou**

The main objectives of the course are to:

- Understand the notion of the limit and be able to evaluate them.
- Understand the continuity of trigonometric functions.
- Understand the derivative and make use of different differentiation techniques.
- Use the derivative to analyze functions.
- Introduced to the integral as a summation and evaluate indefinite and definite integrals.

PREREQUISITE(S): MATH-160 or pass MPT (Mathematics Placement Test)

MATH-191 Calculus II **Dr. M. Christou**

The main objectives of the course are to:

- Study the Indeterminate forms of limits.
- Inverse trigonometric functions.
- Methods of integration.
- Introduction to sequences.
- Infinite series and convergence tests.
- Introduced to polynomial approximations and power series.
- Use integration to evaluate area and volume.

PREREQUISITE(S): MATH-190

MATH-225 Probability and Statistics **Dr. G. Portides**

The course introduces the student to probability, random variables and their distributions. These are theoretical concepts applied to statistical analysis on empirical data, therefore, students will understand the mathematical background of statistical techniques.

PREREQUISITE(S): MATH-191

MATH-270 Calculus III **Dr. N. Papanicolaou**

The main objectives of the course are to:

- Introduce students to coordinate systems, lines and planes in three dimensions.
- Develop all necessary concepts and skills for performing all basic vector algebra operations.
- Familiarize students with functions of two and three variables.
- Develop the theory and techniques of partial differentiation.
- Introduce students to double and triple integration
- Define vector fields and vector differential operators. Present the fundamental concepts that will enable students to work with basic identities.

PREREQUISITE(S): MATH-191

MATH-280 Linear Algebra**Dr. G. Chailos**

The main objectives of the course are to:

- Provide the fundamental theory of Linear systems of equations.
- Introduce the students to the theory of Matrices, and develop the necessary skills in order for the students to be able to apply the theory of Matrices in the Linear Systems theory.
- Provide the notions of eigenvalues, eigenvectors, and diagonalization of square matrices.
- Develop the theory of vectors in \mathbf{R}^n .
- Familiarize the students with the theory of Linear transformations and expose them on some of their main applications.
- Develop the necessary skills to the students, in order to be capable of comprehending abstract algebraic notions, related to vector space theory.
- Offer the fundamental concepts and the elementary theory of finite dimensional vector spaces.

PREREQUISITE(S): MATH-190

MATH-330 Ordinary Differential Equations**Dr. N. Papanicolaou**

The main objectives of this course are to provide students with all the necessary techniques for solving first order ordinary differential equations.

- To familiarize students with the concepts of linear independence, fundamental solutions, general solutions and Initial Value Problems.
- To develop and demonstrate solution methods for linear higher order equations.
- The introduction of applications and modelling using Ordinary Differential Equations.
- To provide students with the fundamentals of the power series method
- Familiarize students with the Laplace Transform and its applications

PREREQUISITE(S): MATH-191

MATH-399 Special Topics in Mathematics**Dr. S. Pouloukas**

Special topics will be selected from the area of mathematics with the intention to give students a larger variety of courses in mathematics. The specific topic may be of mutual interest to the student and faculty member or appropriate for group study.

PREREQUISITE(S): Determined by the topic. Department permission is necessary.

7. Check List

YEAR 1					
✓	Fall Semester	ECTS	✓	Spring Semester	ECTS
<input type="checkbox"/>	ECE-110 DIGITAL SYSTEMS	<input type="checkbox"/>	COMP-113 PROGRAMMING PRINCIPLES II	.....
<input type="checkbox"/>	COMP-111 PROGRAMMING PRINCIPLES I	<input type="checkbox"/>	COMP-114 SOFTWARE DEVEL. LAB II	.....
<input type="checkbox"/>	COMP-112 SOFTWARE DEVEL. LAB I	<input type="checkbox"/>	MATH-191 CALCULUS II	.....
<input type="checkbox"/>	MATH-101 DISCRETE MATHEMATICS	<input type="checkbox"/>	ENGL-101 ENGLISH COMPOSITION	.....
<input type="checkbox"/>	MATH-190 CALCULUS I	<input type="checkbox"/>	ELECTIVE: .....	.....
TOTAL ECTS:		.....	TOTAL ECTS:		.....

YEAR 2					
✓	Fall Semester	ECTS	✓	Spring Semester	ECTS
<input type="checkbox"/>	COMP-201 SYSTEMS ANALYSIS & DESIGN	<input type="checkbox"/>	MATH-225 PROBABILITY AND STATISTICS	.....
<input type="checkbox"/>	COMP-211 DATA STRUCTURES	<input type="checkbox"/>	MATH-280 LINEAR ALGEBRA	.....
<input type="checkbox"/>	COMP-212 OBJECT ORIENTED PROG.	<input type="checkbox"/>	BADM-332 TECHNICAL WRITING	.....
<input type="checkbox"/>	BUS./L.A. ELECTIVE:.....	<input type="checkbox"/>	MAJOR ELECTIVE: .....	.....
<input type="checkbox"/>	BUS./L.A. ELECTIVE:.....	<input type="checkbox"/>	MAJOR ELECTIVE: .....	.....
TOTAL ECTS:		.....	TOTAL ECTS:		.....

YEAR 3					
✓	Fall Semester	ECTS	✓	Spring Semester	ECTS
<input type="checkbox"/>	COMP-321 THEORY OF COMPUTATION	<input type="checkbox"/>	COMP-302 DATABASE MANAGEMENT SYST.	.....
<input type="checkbox"/>	COMP-335 COMP. ORG. & ARCHITECTURE	<input type="checkbox"/>	COMP-354 OPERATING SYSTEMS	.....
<input type="checkbox"/>	MAJOR ELECTIVE:.....	<input type="checkbox"/>	COMP-358 NETWORKS & DATA COMM.	.....
<input type="checkbox"/>	MAJOR ELECTIVE:.....	<input type="checkbox"/>	COMP-370 ALGORITHMS	.....
<input type="checkbox"/>	ELECTIVE:	<input type="checkbox"/>	MAJOR ELECTIVE:.....	.....
TOTAL ECTS:		.....	TOTAL ECTS:		.....

YEAR 4					
✓	Fall Semester	ECTS	✓	Spring Semester	ECTS
<input type="checkbox"/>	COMP-405 ARTIFICIAL INTELLIGENCE	<input type="checkbox"/>	COMP-401 SOFTWARE ENGINEERING	.....
<input type="checkbox"/>	COMP-421 COMPILER DESIGN	<input type="checkbox"/>	COMP-431 COMPUTER SECURITY	.....
<input type="checkbox"/>	COMP-498 FINAL YEAR PROJECT I	<input type="checkbox"/>	COMP-499 FINAL YEAR PROJECT II	.....
<input type="checkbox"/>	MAJOR ELECTIVE:	<input type="checkbox"/>	ELECTIVE:.....	.....
<input type="checkbox"/>	ELECTIVE:.....	<input type="checkbox"/>	ELECTIVE:.....	.....
TOTAL ECTS:		.....	TOTAL ECTS:		.....

TOTAL ECTS COMPLETED: