

COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING		
ACADEMIC UNIT	ELECTRICAL AND COMPUTER ENGINEERING DEPT.		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ECE_INF820	SEMESTER	8
COURSE TITLE	WEB TECHNOLOGIES & APPLICATIONS - ADVANCED		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Seminars / Practice exercises		1	
Laboratory		1	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).</i>		5	5
COURSE TYPE <i>general background, special background, specialised, general knowledge, skills development</i>	Specialized, Skills Development		
PREREQUISITE COURSES:	No. Students are advised to have already attended the course: ECE_INF750 "Web Technologies and Applications "		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://www.ece.uop.gr		

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> <p>Course content aims to enable the students to learn techniques and technologies for server-side programming. Emphasis is placed on acquiring practical skills for developing integrated web-based applications that combine client & server-side technologies and interacting with databases, as well as on the development and set up of Web Services. Issues related to the use of Content Management Systems (CMS) are also discussed. Finally, the basic concepts of the Semantic Web, such as metadata, ontologies, inference logic, and rules, are introduced.</p> <p>Upon successful completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> - At the knowledge level: <ul style="list-style-type: none"> • know the basic rules for developing World Wide Web applications. • have a clear picture of the vision of the Semantic Web, knowing the limitations of today's Web that led to the transition to Semantic Web (with examples) and the current technologies of the Semantic Web.

- understand how to describe the resources of the World Wide Web with the RDF data model, as well as the rendering of semantics in the RDF Schema language.
- understand the basic concepts related to ontologies, the basic requirements of ontologies languages and the basic principles of the OWL language.
- understand the basic principles of inference logic and the rules of RuleML.
- At the skill level:
 - query RDF documents through the SPARQL query language.
 - use software programs to develop code in XML, DTD, XML Schema, XPath, XSLT, RDF, RDFS, SPARQL, OWL, RuleML and check the validity of documents of the World Wide Web.
 - create structured World Wide Web documents in XML as well as define them with DTDs and XML Schema files.
 - query XML documents through the XPath query language, as well as format and convert XML documents using XSLT.
- At the level of abilities:
 - develops server-side web applications (PHP, ASP.NET).
 - develop integrated web applications that combine client & server-side technologies.
 - develop web applications that interact with databases.
 - develop web services.
 - use and expand content management systems.
 - develop high-interaction web applications using JQuery and JQuery Mobile Javascript libraries.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
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Others...
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- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making.
- Working independently.
- Teamwork.
- Working in an international environment.
- Production of free, creative and inductive thinking
- Creation of new research ideas

(3) SYLLABUS

This course focuses on advanced topics of Web technologies aimed at developing complex and integrated systems on the Web.

The course is developed in 13 lectures.

- i. An Introduction to PHP: Basic Structure – Syntax, Data Types, Variables, Branching and Looping, Functions.
- ii. PHP and HTML Forms Handling. Database communication (PHP with MySQL). Error handling and debugging.
- iii. Sessions & Security Techniques: Using cookies and sessions, data security issues. Advanced issues with PHP and Applications.
- iv. An Introduction to ASP.NET and C #.

v.	Advanced development with ASP.NET and C #.
vi.	Web Services: SOAP Protocol, Web Services Description Language (WSDL), UDDI.
vii.	Content Management Systems: Configuring and extending popular open-source CMSs.
viii.	Advanced Topics with Content Management Systems: Creating an extension, Theming.
ix.	JQuery Library. JQuery Mobile Library
x.	Semantic Web Basic Technologies and Standards. Introduction to the concepts of metadata, ontologies, inference logic, and rules.
xi.	Structured Web documents in the XML language. Detailed presentation of alternative ways of defining XML document construction with DTD and XML Schema. Reference to sections of an XML document – querying XML documents via the XPath language, Formatting, and transforming an XML document to HTML with the XSLT language.
xii.	World Wide Web resource description with RDF data model and semantics rendering with RDF Schema language. Query RDF documents through SPARQL query language. Basic concepts related to ontologies, hierarchies of classes and properties, snapshots, basic requirements of ontology languages, Detailed presentation of OWL language.
xiii.	Basic principles of inference logic and rules, introduction to RuleML, Semantic Web case studies.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY</p> <p style="text-align: center;"><i>Face-to-face, Distance learning, etc.</i></p>	<ul style="list-style-type: none"> • Face-to-face 																				
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p> <p style="text-align: center;"><i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<ul style="list-style-type: none"> • Learning process support via the electronic e-class platform. • PowerPoint presentations with examples and practice exercises in the classroom. • Laboratory Exercises using a PC. • During the lectures, a computer is used to write and run code. 																				
<p style="text-align: center;">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Activity</th> <th style="text-align: center;">Semester workload</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Lectures</td> <td style="text-align: center;">39</td> </tr> <tr> <td style="text-align: center;">Seminars</td> <td style="text-align: center;">13</td> </tr> <tr> <td style="text-align: center;">Laboratory practice</td> <td style="text-align: center;">13</td> </tr> <tr> <td style="text-align: center;">Preparation of laboratory exercises</td> <td style="text-align: center;">13</td> </tr> <tr> <td style="text-align: center;">Study of lectures and bibliography</td> <td style="text-align: center;">47</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;">Course Total</td> <td style="text-align: center;">125 hours (5 ECTS)</td> </tr> </tbody> </table>	Activity	Semester workload	Lectures	39	Seminars	13	Laboratory practice	13	Preparation of laboratory exercises	13	Study of lectures and bibliography	47							Course Total	125 hours (5 ECTS)
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<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-</i></p>	<p>Written final exam (up to 60% -80% of the final grade) and lab project (20% -40% depending on the degree of difficulty) which includes:</p> <ul style="list-style-type: none"> - Theory evaluation. - Short answer questions. - Multiple choice questions. 																				

<p><i>ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<ul style="list-style-type: none"> - Problem-solving related to: <ul style="list-style-type: none"> • Design of usable websites. • Development with programming languages taught to achieve the desired result. • Correction of syntactic and logical errors within programs. • Utilization of client & server-side technologies for the development of integrated World Wide Web applications. • Development of Web Services. • Customization and extension of content management systems.
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(5) ATTACHED BIBLIOGRAPHY

<p><i>- Suggested bibliography:</i></p> <ul style="list-style-type: none"> • PHP and MySQL Web Development, ISBN-10: 0321833899, Welling Luke, Thomson Laura. • PHP for the Web: Visual QuickStart Guide, Larry Ullman, ISBN: 978-960-461-250-5, 2009. • Grigoris Antoniou, Frank van Harmelen, «An Introduction to the Semantic Web», ISBN: 978-960-461-234-5, 2009. <p><i>- Related academic journals:</i></p> <ul style="list-style-type: none"> • ACM Transactions on the Web • Springer World Wide Web • Elsevier, Journal of Web Semantics • River Publishing, Journal of web Engineering • IEEE Internet Computing
