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HCI101: Cognitive Ergonomics (compulsory)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Postgraduate Program		
COURSE CODE	HCI101	SEMESTER OF STUDY	1st
COURSE TITLE	Cognitive Ergonomics		
INDEPENDENT TEACHING ACTIVITIES <i>where credit is awarded for discrete parts of the course e.g. lectures, laboratory exercises, etc. If credit is awarded for the whole course, indicate the weekly teaching hours and the total number of credits</i>		TEACHING HOURS	CREDITS
lectures		26	1.8
Laboratory exercises		6	1.2
Project work		6	3.0
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF TEACHING and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/NOC3069/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area - Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B - Comprehensive Guide to the Writing of Learning Outcomes 														
<p>On completing the course the participants will be able to:</p> <p>Understand and handle in a systematic way human cognitive abilities and limitations as well as diversities among humans</p> <p>Understand the main phenomena of human cognition, (i.e. perception, memory, information processing, decision making)</p> <p>Apply multiple methods for the analysis of human goal oriented activity, from ethnography to video-assisted, eye-tacking observation, to field experiments, interviews and surveys.</p> <p>Apply principles and methods for the analysis and modelling of interactions between humans and artefacts (in both the physical and informational domains)</p> <p>Contribute in the full cycle of a User Centered Design process.</p>														
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table> <tr> <td><i>Adaptation to new situations</i></td> <td><i>Respect for diversity and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Autonomous work</i></td> <td><i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i></td> </tr> <tr> <td><i>Group work</i></td> <td><i>Exercise of criticism and self-criticism</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Promotion of free, creative and deductive thinking</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td><i>..... Other...</i></td> </tr> <tr> <td><i>Generating new research ideas Project planning and management</i></td> <td></td> </tr> </table>	<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>	<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>	<i>Generating new research ideas Project planning and management</i>	
<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>													
<i>Decision-making</i>	<i>Respect for the natural environment</i>													
<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>													
<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>													
<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>													
<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>													
<i>Generating new research ideas Project planning and management</i>														
<p>Group work, Demonstrating social, professional and ethical responsibility and gender sensitivity. Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas Project planning and management.</p>														

(3) COURSE CONTENT

<p>Part A. Theory / models</p> <ul style="list-style-type: none"> • Introduction to cognitive ergonomics • Models of cognition, mental representations, mediation & signs • Models of human activity - Human Action Cycle, SRK, Complex Cognitive Tasks, errors / biases <p>Part B UCD process & methods</p> <ul style="list-style-type: none"> • Need-finding methods • User Requirements analysis/ Personas / Use Case scenarios • Requirements specification / Conceptual design (HTA, STDs, Flowcharts, Blue prints) • Prototyping / Iterative Design • Elements of interface / Information Design • Usability Inspection methods • User Testing methods

(4) TEACHING AND LEARNING METHODS - EVALUATION

<p>MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i></p>	Face-to-face	
<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i></p>	In the course project various software are used. Teaching content is delivered through the institutional learning management system (eclass)	
<p>ORGANISATION OF TEACHING <i>Means and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc. Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i></p>	<p>Activity</p>	<p>Workload</p>
	Lectures	26
	Practicals – lab work	6
	Project work	64
	Exam - assignment	28
	Self-study	26
	Total Course	150 (6 ECTS)
<p>STUDENT ASSESSMENT <i>Description of the assessment procedure Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i></p>	20% practicals, 50% Design and evaluation of an interactive system (project), 30% Essay on an area of the course, oral presentation	

(5) RECOMMENDED-BIBLIOGRAPHY

<p><i>D. Benyon et al., designing user experience, a guide to HCI, UX and Interaction design, 4th Edition, Pearson, 2019</i></p> <p><i>Selected papers from ACM Conference on Computer Human Interaction (CHI)</i></p>

HCI102: Research Methods (compulsory)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI102	SEMESTER OF STUDY	1st
COURSE TITLE	Research Methods		
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>	TEACHING HOURS	CREDITS	
lectures	26	1.8	
Laboratory exercises	5	1.2	
Project work	12	3.0	
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	Specialized general knowledge		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/NOC3067/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - <i>Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area</i> - <i>Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B</i> - <i>Comprehensive Guide to the Writing of Learning Outcomes</i>
<p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Recognize what research in HCI is about and what methods have been used historically and currently. • Recognize types of behavioural research • Know and to apply research methods in HCI, and in particular: <ul style="list-style-type: none"> ○ Define proper research hypotheses ○ Create a proper experiment protocol ○ Identify dependent and independent variables ○ Setting up an experiment (randomization, significance tests, common errors, limitations) ○ Investigating a single independent variable (between-group and within-group design) ○ Investigating more independent variables (factorial design, split-plot design) ○ Identify the reliability of experimental results (understanding and copying with various biases) • Apply HCI research methods such as:

- Diaries
- Interviews
- Focus Groups
- Ethnography
- Apply basic statistical analysis methods (using proper tools such as SPSS) on data derived from HCI research methods. These methods include:
 - Descriptive statistics, identifying box plots, outliers, and measuring confidence interval
 - Measure the data normality, measure internal consistency
 - Data preparation and data cleaning
 - Perform significance tests (both parametric and non-parametric)

General competences

Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?

Adaptation to new situations

Decision-making

Autonomous work

Group work

Working in an international environment

Working in an interdisciplinary environment

Generating new research ideas Project planning and management

Respect for diversity and multiculturalism

Respect for the natural environment

Demonstrating social, professional and ethical responsibility and gender sensitivity

Exercise of criticism and self-criticism

Promotion of free, creative and deductive thinking

..... Other...

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Team work
- Project planning and management
- Showing social, professional and ethical responsibility and sensitivity to gender issues
- Production of free, creative and inductive thinking

(3) SYLLABUS

The course is based on the following 13 UNITS:

1. Measurements in HCI. The interdisciplinary nature of HCI.
2. Hypotheses and Experiments. Experiment protocol.
3. Measurement tools and methods. Bias during HCI research methods.
4. Types of behavioral research. Research hypotheses.
5. Between-group and within-group design of experiments. Working with human subjects.
6. Surveys, Interviews, and Focus Groups.
7. First part of the assignment. Students' presentations.
8. Diaries, and Ethnography.
9. Descriptive statistics. Box plots, outliers. Confidence interval.
10. Normal data distribution. Internal consistency of questionnaires. Data preparation and data cleaning.
11. Significance tests. Practical work (laboratory) on HCI data analysis.
12. Summary of methods. Analysis of variance. Parametric and non-parametric tests. How to use more methods.
13. Final part of the assignment. Students' presentations.

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	Lectures will use slides that will be available through the university LMS (eClass). Content provision and communication with the professors and peers will also be through eClass (messages and e-forum).	
TEACHING METHODS <i>Means and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i> <i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	2 hours x 13 weeks = 26
	Recitation	1 hour x 13 weeks = 26
	Project (preparation, development, peer assessment)	3 parts of the project x 18 hours = 54
	Study and analysis of bibliography	3 hours x 12 weeks = 36
	Participating in exams (3 students' presentations)	9
	Total Course	151 (6 ECTS)
STUDENT ASSESSMENT <i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	20% practicals, 50% Design of an HCI experiment (defining the methods and analyzing the data), 30% oral presentations (3 presentations in three phases of the project).	

(5) RECOMMENDED-BIBLIOGRAPHY

<p>Basic bibliography</p> <p>The course is based on:</p> <ul style="list-style-type: none"> • Research Methods in Human-Computer Interaction, Second Edition, Jonathan Lazar, Jinjuan Heidi Feng, Harry Hochheiser. • Quantifying the User Experience: Practical Statistics for the User Research, Jeff Sauro, James R. Lewis.

HCI103: Interactive Technologies (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI103	SEMESTER OF STUDY	1st
COURSE TITLE	Interactive Technologies		
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>	TEACHING HOURS	CREDITS	
lectures	26	1.8	
Laboratory exercises	6	1.2	
Project work	6	3.0	
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/NOC3069/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area - Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B - Comprehensive Guide to the Writing of Learning Outcomes 														
<p>Upon completion of this course, the student should be familiar with the basic theoretical principles that govern the interaction of the user with machines in the modern world. He/she should also be familiar with the technologies, methods, and tools for designing and development of usable interactive software systems</p>														
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table> <tr> <td><i>Adaptation to new situations</i></td> <td><i>Respect for diversity and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Autonomous work</i></td> <td><i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i></td> </tr> <tr> <td><i>Group work</i></td> <td><i>Exercise of criticism and self-criticism</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Promotion of free, creative and deductive thinking</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td><i>..... Other...</i></td> </tr> <tr> <td><i>Generating new research ideas Project planning and management</i></td> <td></td> </tr> </table>	<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>	<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>	<i>Generating new research ideas Project planning and management</i>	
<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>													
<i>Decision-making</i>	<i>Respect for the natural environment</i>													
<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>													
<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>													
<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>													
<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>													
<i>Generating new research ideas Project planning and management</i>														
<p>Group work, Demonstrating social, professional and ethical responsibility and gender sensitivity, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas Project planning and management.</p>														

(3) SYLLABUS

UNIT 01: Introduction a framework for experience design. Introduction of the PACT (People, Activities, Context, Technology) framework
 UNIT 02: The design process and usability
 UNIT 03 Introduction to UCD - Human Centered Design Principles
 UNIT 04: Discover, the process of understanding
 UNIT 05: Techniques for design
 Unit 06: Evaluation in interaction design
 Unit 07: Design considerations - visual interface design, direct manipulation interaction and navigation.
 Unit 08: Design considerations - human and command languages, interaction devices, design of social and collaborative systems.
 Unit 09: Haptic and natural interfaces
 Unit 10: Human Cognitive Models, Human Information Processing Model, GOMS, KLM, perception, memory and attention.

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
TEACHING METHODS <i>Means and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc. Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	26
	Practicals – lab work	6
	Project work	64
	Exam - assignment	28
	Self-study	26
	Total Course	150 (6 ECTS)
STUDENT ASSESSMENT <i>Description of the assessment procedure Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	20% practicals, 50% Design and evaluation of an interactive system (project), 30% Essay on an area of the course, oral presentation	

(5) RECOMMENDED-BIBLIOGRAPHY

D. Benyon et al., designing user experience, a guide to HCI, UX and Interaction design, 4th Edition, Pearson, 2019
Selected papers from ACM Conference on Computer Human Interaction (CHI)

HCI104: Computer Graphics and Virtual Reality (elective)

(1) GENERAL

SCHOOL	University of Patras		
ACADEMIC UNIT	Department of Electrical and Computer Engineering		
LEVEL OF STUDIES	Undergraduate and graduate		
COURSE CODE	HCI104	SEMESTER	1st
COURSE TITLE	Computer Graphics and Virtual Reality		
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	3	
laboratory exercises	3	3	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>	6	6	
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge		
PREREQUISITE COURSES:	There are no prerequisite courses.		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English/Greek teaching – English examination		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/EE844/		

(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"> • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes <ul style="list-style-type: none"> • Knowledge on the computer graphics pipeline, information visualization and virtual reality • Knowledge on drawing basic geometric primitives and 3D models • Mathematical background on representation, 3D transformation, and projection of 2D and 3D objects • Mathematical models of shading, global illumination along with practical implementations in a programming environment • Color, texture and shadow management • Knowledge on practical implementations of synthetic motion of rigid and articulated objects • Knowledge on virtual reality systems, projections, interaction, feedback
<p>General Competences</p> <p><i>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?</i></p> <p><i>Search for, analysis and synthesis of data and information, Project planning and management</i></p>

<i>with the use of the necessary technology</i> <i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</i>	<i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i> <i>Others...</i>
<ul style="list-style-type: none"> • Preparation of engineers in the field of Computer Graphics and Virtual Reality on real-time graphics and 3D object representation • Familiarization with the mathematical models and their practical implementation in a programming environment • Use of object-oriented programming (C++) for the demonstration (lab), development (assignments) of the practical applications of the course • Familiarization and use of modern software libraries of computer graphics (OpenGL, game engines) • Design and implementation of computer graphics and virtual/augmented reality systems • Use of computer programming and specialized libraries for the development of 3D real-time computer graphics applications • Advanced shader programming • State-of-the-art graphics methods use and implementation 	

(3) SYLLABUS

<ul style="list-style-type: none"> • <u>Basic Concepts:</u> Introduction in computer graphics and virtual reality, graphics pipeline, I/O graphics devices, drawing algorithms, polygon drawing, anti-aliasing. Affine transformations, 2D and 3D transformations, homogenous coordinates, viewport transformations. • <u>Common procedures:</u> Line and polygon culling algorithms in 2D and 3D. Projections. Stereoscopic vision. Z-buffering. Shadows, texture. Basic shading principles. Color. • <u>Advanced topics:</u> Ray tracing, global illumination, motion, articulated motion, virtual reality simulations, physics-based simulations. Virtual, augmented and mixed reality.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Lectures using PowerPoint slides. Visual demonstration of basic concepts using videos or Mathematica scripts • Problem-solving seminars for the instructive solution of typical and synthetic problems • Internet access to electronic version of lectures (e-class) material • Possibility of design and implementation of a heavy course-assignment in the areas of the course 	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <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> <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>	Activity	Semester workload
	Lectures	39 hours
	Course assignment (Study and implementation) or Study for exams	>120 hours >120 hours
	Course total	>159

<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-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"> • Written examination on problems and theoretical questions. • Possibility of design and implementation of a heavy course-assignment in the areas of the course that substitutes the written exam. Deliverables of the course-assignment are a written report and the implementation (code). Open to all presentations of the course-assignments are also foreseen. • Minimum grade for passing the course: 5.
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(5) ATTACHED BIBLIOGRAPHY

<ul style="list-style-type: none"> • Gortler S.J. «Foundations of 3D Computer Graphics», MIT Press, 2012. • Burdea G.C, Coiffet P. «Virtual Reality Technology», Willey-Blackwell, 2003. • SIGGRAPH tutorials <p>- Related academic journals:</p> <ul style="list-style-type: none"> • IEEE Transactions on Visualization and Computer Graphics • ACM Transactions on Graphics

HCI105: Artificial Intelligence (elective)

1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	ELECTRICAL AND COMPUTER ENGINEERING		
LEVEL OF COURSE	POSTGRADUATE		
COURSE CODE	HCI105	SEMESTER OF STUDY	1st
COURSE TITLE	ARTIFICIAL INTELLIGENCE		
INDEPENDENT TEACHING ACTIVITIES 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		TEACHING HOURS PER WEEK	ECTS CREDITS
Lectures		3 x 13 weeks	3
Labs		3 x 13 weeks	3
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>		5 x 13 weeks	6
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Field of science		
PREREQUISITE COURSES:			
TEACHING AND ASSESSMENT LANGUAGE:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBPAGE (URL)	https://eclass.upatras.gr/courses/EE927/		

2. LEARNING OUTCOMES

<p>Learning outcomes 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.</p> <p>Consult Appendix A</p> <ul style="list-style-type: none"> • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes
<p>Learning outcomes: At the end of this course, students will be able to apply AI problem-solving methods and to use various search techniques. They will also acquire basic knowledge in the fields of propositional logic, predicate logic, decision making, game theory, and machine learning.</p> <p>Skills: At the lab sessions, students learn to program in Prolog and to use the machine-learning platform Weka.</p>
<p>General Abilities 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?</p>

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
Others

- Search for, analysis and synthesis of data and information, with the use of the necessary technology.
- Adapting to new situations
- Decision-making
- Working independently
- Production of new research ideas

3. COURSE CONTENT

- Introduction
 - Definition of AI
 - Brief History of AI
 - Connections with Other Disciplines
- Search Algorithms – Constraint Satisfaction
 - State Spaces
 - Search Trees
 - Uninformed Search
 - Partially Informed Search
 - Informed Search
 - Local Search
 - Constraint propagation
 - Forward Checking
 - Arc Consistency
 - Adversarial Search
- Game Theory
 - Games with Sequential Moves
 - Games with Simultaneous Moves
 - Nash Equilibrium
 - Utility Theory and Rational Choice
- Knowledge Representation and Reasoning - Foundations
 - Patterns of Reasoning
 - Propositional Logic
 - Resolution in Propositional Logic
 - First-Order Logic (Predicate Logic)
 - Resolution in First-Order Logic
- Machine Learning
 - Building Models
 - Decision Trees
 - Bayesian Networks
 - Probabilistic Reasoning
 - Markov Models
 - Genetic Algorithms
 - Neural Networks

4. TEACHING AND LEARNING METHODS – ASSESSMENT

<p>TEACHING METHOD <i>Face-to-face, Distance learning, etc.</i></p>	Face to face and/or distance learning	
<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	The course is supported by an electronic learning space at eclass.upatras.gr , through which students receive course material, video-recorded lectures, exercises, slides, instructions, and announcements about lectures, lab sessions, and the exams. Moreover, students are supported through zoom and kahoot.	
<p>TEACHING ORGANIZATION <i>The manner and methods of teaching are described in detail. 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. 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>	Activity	Semester Work Load
	Lectures	39
	Private study	60
	Tutorials	24
	Laboratory practice	24
	Exams	3
<p>STUDENT ASSESMENT <i>Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<ol style="list-style-type: none"> 1. Each laboratory exercise is marked with either a pass or a fail. Students need a pass for least 67% of their lab exercise to be eligible to participate in the final exam. 2. Tutorial exercises are multiple-choice questions submitted to eclass. They do not receive a mark (they are only for practice). 3. A final exam that determines the overall grade for the course. 	
	<p>Total number of hours for the Course (25 hours of work-load per ECTS credit)</p>	
	<p>150 (6 ECTS)</p>	

5. RECOMMENDED LITERATURE

- S. Russell, P. Norvig, "Artificial Intelligence - A Modern Approach", 4th US Edition, 2021.

HCI106: Collaboration Technologies (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI106	SEMESTER OF STUDY	1st
COURSE TITLE	Collaboration Technologies		
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>	TEACHING HOURS	CREDITS	
lectures	26	1.8	
Laboratory exercises	6	1.2	
Project work	6	3.0	
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	Specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	http://imis.upatras.gr/course_colltech/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - <i>Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area</i> - <i>Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B</i> - <i>Comprehensive Guide to the Writing of Learning Outcomes</i> 		
<p>This course introduces selected technologies supporting and enhancing collaboration among members of a team. It falls within the scientific area known as "Computer-Supported Cooperative Work (CSCW). The first part of the course attempts a review of these technologies, revealing their advantages and disadvantages. In addition, it covers a range of issues related to Open Collaboration and Web 2.0 environments. The second part of the course focuses on prominent collaboration processes, such as group decision making, collective knowledge management, argumentation and recommendation</p> <p>Upon completion of this course, the student should be familiar with modern collaboration technologies and practices. He/she should also be able to develop skills towards the effective implementation and utilization of these technologies in modern business and organizational contexts.</p>		
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i> </td> </tr> </table>	<ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> 	<ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i>
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Decision-making; Group work; Working in an interdisciplinary environment; Exercise of criticism and self-criticism; Promotion of free, creative thinking; Generating new research ideas; Project planning and management.

(3) SYLLABUS

UNIT 1 Computer-based Collaboration
 UNIT 2 Collaboration Support Tools and Contexts
 UNIT 3 Collaboration and Web 2.0
 UNIT 4 Open Collaboration
 UNIT 5 Collaborative Decision Making
 UNIT 6 Collective Knowledge Management
 UNIT 7 Argumentation Support
 UNIT 8 Recommender Systems

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software tools are used; content is delivered through the institutional learning management system (eclass) and the instructor's dedicated web page.	
TEACHING METHODS <i>Means and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i> <i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	26
	Practicals	6
	Project work	64
	Exam - assignment	28
	Self-study	26
	Total Course	150 (6 ECTS)
STUDENT ASSESSMENT <i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	20% practicals, 50% partial development of a collaboration support system (semester project), 30% essay on a specific area of the course, oral examinations.	

(5) RECOMMENDED-BIBLIOGRAPHY

- R.M. Baecker (ed.): Readings in Groupware and Computer-Supported Cooperative Work: Assisting Human-Human Collaboration, Morgan Kaufmann, 1993.
- E. Wenger: Communities of Practice: Learning, Meaning & Identity, Cambridge Univ. Press, 1998.
- P. Dourish: Where The Action Is: The Foundations of Embodied Interaction, MIT Press, 2001.

- L. Suchman: Human-Machine Reconfigurations: Plans & Situated Actions, Cambridge University Press, 2007.
- J. Preece: Online communities: Designing Usability, Supporting Sociability, John Wiley & Sons, 2000.
- A. Dix, J. Finlay, G.D. Abowd, R. Beale: Human-Computer Interaction, Pearson Prentice Hall, 2004.
- B.E. Munkvold: Implementing Collaboration Technologies in Industry, Springer, 2003.
- F. Ricci, L. Rokach, B. Shapira, P.B. Kantor (Eds), Recommender Systems Handbook, Springer, 2011.

HCI109: Information Visualization (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Postgraduate Program		
COURSE CODE	HCI109	SEMESTER OF STUDY	1st
COURSE TITLE	Information Visualization		
INDEPENDENT TEACHING ACTIVITIES <i>where credit is awarded for discrete parts of the course e.g. lectures, laboratory exercises, etc. If credit is awarded for the whole course, indicate the weekly teaching hours and the total number of credits</i>	TEACHING HOURS	CREDITS	
lectures	13	0.9	
Laboratory exercises	6	1.2	
Project work	23	3.9	
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF TEACHING and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://github.com/upatras-hci/iv		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - <i>Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area</i> - <i>Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B</i> - <i>Comprehensive Guide to the Writing of Learning Outcomes</i> 		
<p>Upon completion of this course, the student should be familiar with the forces that have shaped the interaction of the user with machines in the modern world. He/she should also become familiar with the technologies, methods, and tools for designing and development of interactive software systems in a collaborative context</p>		
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> </td> <td style="vertical-align: top; padding-left: 20px;"> <ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i> </td> </tr> </table>	<ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> 	<ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i>
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<p>Group work, Demonstrating social, professional and ethical responsibility and gender sensitivity, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Project planning and management</p>		

(3) COURSE CONTENT

UNIT 01: Information visualization context
 UNIT 02: Historical perspective
 UNIT 03: User needs
 UNIT 04: Prototyping
 UNIT 05: User evaluation
 Unit 06: Collaborative systems
 Unit 07: Ubiquitous interaction
 Unit 08: Information aesthetics
 Unit 09: Big and deep data
 Unit 10: Established and novel information visualization systems

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Online, distance																							
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software and devices are used, content is delivered through a custom learning management system (github)																							
ORGANISATION OF TEACHING <i>Means and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc. Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	<table border="1"> <thead> <tr> <th data-bbox="651 981 979 1016">Activity</th> <th data-bbox="987 981 1315 1016">Workload</th> </tr> </thead> <tbody> <tr> <td data-bbox="651 1016 979 1052">Lectures</td> <td data-bbox="987 1016 1315 1052">13</td> </tr> <tr> <td data-bbox="651 1052 979 1088">Practicals – lab work</td> <td data-bbox="987 1052 1315 1088">19</td> </tr> <tr> <td data-bbox="651 1088 979 1124">Project work</td> <td data-bbox="987 1088 1315 1124">64</td> </tr> <tr> <td data-bbox="651 1124 979 1160">Exam - assignment</td> <td data-bbox="987 1124 1315 1160">20</td> </tr> <tr> <td data-bbox="651 1160 979 1196">Self-study</td> <td data-bbox="987 1160 1315 1196">34</td> </tr> <tr> <td data-bbox="651 1196 979 1232"></td> <td data-bbox="987 1196 1315 1232"></td> </tr> <tr> <td data-bbox="651 1232 979 1267"></td> <td data-bbox="987 1232 1315 1267"></td> </tr> <tr> <td data-bbox="651 1267 979 1303"></td> <td data-bbox="987 1267 1315 1303"></td> </tr> <tr> <td data-bbox="651 1303 979 1339"></td> <td data-bbox="987 1303 1315 1339"></td> </tr> <tr> <td data-bbox="651 1339 979 1375">Total Course</td> <td data-bbox="987 1339 1315 1375">150 (6 ECTS)</td> </tr> </tbody> </table>		Activity	Workload	Lectures	13	Practicals – lab work	19	Project work	64	Exam - assignment	20	Self-study	34									Total Course	150 (6 ECTS)
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Total Course	150 (6 ECTS)																							
STUDENT ASSESSMENT <i>Description of the assessment procedure Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	100% practicals, oral presentation																							

(5) RECOMMENDED-BIBLIOGRAPHY

- Recommended Bibliography:
<https://pibook.epidro.me>

HCI110: Software Quality (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI110	SEMESTER OF STUDY	1st
COURSE TITLE	Software Quality		
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>	TEACHING HOURS	CREDITS	
lectures	26	1.8	
Laboratory exercises	5	1.2	
Project work	12	3.0	
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	Specialized general knowledge		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/CEID1030/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - <i>Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area</i> - <i>Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B</i> - <i>Comprehensive Guide to the Writing of Learning Outcomes</i>
<p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Recognize basic software quality standards and to use them effectively. • Know and to apply software quality methods throughout the software engineering cycle, and in particular: <ul style="list-style-type: none"> ○ Quality processes on requirements analysis (such as formal specifications, Petri Nets) ○ Quality processes on software design (such as the LUCID methodology, usability design). ○ Quality processes on software development (by using software metrics). ○ Quality processes on software testing (such as the basic path method). • Evaluate software usability using methods: <ul style="list-style-type: none"> ○ Analytical methods (such as heuristic evaluation, KLM model). ○ Experimental methods (such as the thinking aloud protocol). ○ Inquiry methods (such as questionnaires, focus groups, standard usability scale).

General competences

Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?

<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>
<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>
<i>Generating new research ideas Project planning and management</i>	

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Team work
- Project planning and management
- Showing social, professional and ethical responsibility and sensitivity to gender issues
- Production of free, creative and inductive thinking

(3) SYLLABUS

The course is based on the following 13 UNITS:

14. Definition of Quality, differences of software quality and products quality, total quality management.
15. Statistical quality control, quality standards, CMM and CMMI, ISO standards, IEEE and ACM standards.
16. Software process quality, FCM model, ISO9126 standard, quality in all software engineering phases (from requirements to testing).
17. Quality on requirements analysis, formal specifications, Petri Nets.
18. Quality on software design, usability, ISO9241 standard, LUCID methodology, usability evaluation.
19. Analytical methods, the KLM model, Fitts law, heuristic evaluation.
20. Experimental methods, thinking aloud protocol.
21. inquiry methods, questionnaires, focus groups, standard usability scale.
22. Quality on software development, software metrics and measurements.
23. Size structure and data metrics, LOC and Halstead metrics.
24. Complexity metrics, McCabe metric.
25. Quality on testing, basic path testing, cause and effect diagram.
26. Quality on maintenance, cost of quality.

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	Lectures will use slides that will be available through the university LMS (eClass). Content provision and

	communication with the professors and peers will also be through eClass (messages and e-forum).	
<p>TEACHING METHODS</p> <p><i>Means and methods of teaching are described in detail.</i></p> <p><i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i></p> <p><i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i></p>	Activity	Workload
	Lectures	2 hours x 13 weeks = 26
	Recitation	2 hours x 13 weeks = 26
	Project (preparation, development, peer assessment)	5 projects x 12 hours = 60
	Study and analysis of bibliography	3 hours x 12 weeks = 36
	Participating in exams (2 short ones and one final)	5
	Total Course	153 (6 ECTS)
<p>STUDENT ASSESSMENT</p> <p><i>Description of the assessment procedure</i></p> <p><i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i></p> <p><i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i></p>	<p>A grade higher to 4.0 is required on the 4+1 projects (the peer assessment counts as one project) for the participation on the exams. This counts as the laboratory part of the final grade. Any student with laboratory grade 7.5 or higher may use this grade as the final course grade (after oral exams on their projects) or choose to participate in the written exams (in this case the laboratory grade counts for 50% of the final grade). The written examination counts for 50% of the final grade, while a passing grade is also required.</p> <p>Written exams deal with problem solving related to the projects but in a smaller scale. Exams are in Greek, as well as in English for ERASMUS students.</p>	

(5) RECOMMENDED-BIBLIOGRAPHY

Suggested bibliography

- April, A., & Laporte, C. Y. (2018). Software Quality Assurance. John Wiley & Sons.
- Fenton, N., & Bieman, J. (2014). Software metrics: a rigorous and practical approach. CRC Press.
- Davis, C. W. (2015). Agile metrics in action: Measuring and enhancing the performance of agile teams.
- Jones, C., & Bonsignour, O. (2011). The economics of software quality. Addison-Wesley Professional.
- Lazar, J., Feng, J. H., & Hochheiser, H. (2017). Research methods in human-computer interaction. Morgan Kaufmann.

Relative Scientific Journals

- Software Quality Journal, Springer
- ACM Transactions on Computer-Human Interaction (TOCHI)

HCI201: Design and Evaluation of Interactive Systems (compulsory)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI201	SEMESTER OF STUDY	2nd
COURSE TITLE	Design and Evaluation of Interactive Systems		
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>		TEACHING HOURS	CREDITS
lectures		26	1.8
Laboratory exercises		6	1.2
Project work		6	3.0
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/NOC3072/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area - Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B - Comprehensive Guide to the Writing of Learning Outcomes
<p>Upon completion of this course, the student should be familiar with the basic interaction design principles and the techniques for evaluating the usability of interactive systems. More specifically the student should have the theoretical knowledge of such principles and methods and be able to apply the methods when given a realistic system scenario. The student should be able to:</p> <ul style="list-style-type: none"> • use fast prototyping tools to create screen designs and interactive system mockups • critically comment on design decisions in terms of their usability • make redesign decisions based on usability evaluation remarks • apply heuristic evaluation and work in groups of evaluators • set up and conduct user testing sessions • design and assess user questionnaires • use eye-tracking equipment and software and interpret eye-tracking metrics • collect, analyze and present test data • draw significant conclusions from user testing sessions

General competences

Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?

Adaptation to new situations

Decision-making

Autonomous work

Group work

Working in an international environment

Working in an interdisciplinary environment

Generating new research ideas Project planning and management

Respect for diversity and multiculturalism

Respect for the natural environment

Demonstrating social, professional and ethical responsibility and gender sensitivity

Exercise of criticism and self-criticism

Promotion of free, creative and deductive thinking

..... Other...

Group work, Decision making, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas, Project planning and management, Respect for diversity and multiculturalism, Demonstrating social, professional and ethical responsibility and gender sensitivity

(3) SYLLABUS

UNIT 01: Introduction to the course and to PBL (project-based learning).

UNIT 02: Principles of good design, design focus examples, personas

UNIT 03: From system scenario scripts to mockups, personas in action

UNIT 04: Evaluation of mockups and personas for all student projects

UNIT 05: Revision of initial mockups and personas, enrichment of mockups, adding interactivity

UNIT 06: Improvement of designs by speeding up selected tasks using KLM calculations

UNIT 07: How to conduct Heuristic evaluation

UNIT 08: How to conduct user testing, prepare user tasks and questionnaires

UNIT 09: What is eye-tracking, eye-tracking metrics, pros and cons

UNIT 10: Hands on user testing sessions

UNIT 11: Analysis of data collected by user questionnaires and eye-tracking and presentation of results

UNIT 12: Writing of group assignments integrating all design, evaluation and re-design phases, the methods used, the data collected, and their analysis, presentation and discussion on main findings.

UNIT 13: Oral presentation and demonstration of group projects

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
TEACHING METHODS <i>Means and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc. Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	2 hours x 13 weeks = 26
	Recitation	1 hour x 13 weeks = 26
	Project (preparation, development, peer assessment)	3 parts of the project x 20 hours = 60
	Study and analysis of bibliography	3 hours x 12 weeks = 36
	Participating in exams (3 students' presentations)	6
	Total Course	154 (6 ECTS)

STUDENT ASSESSMENT	
<p><i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i></p>	<p>20% practicals, 50% Design and evaluation of an interactive system (project), 30% Oral presentation of group project</p>

(5) RECOMMENDED-BIBLIOGRAPHY

<ul style="list-style-type: none"> • Dix, Alan, et al. Human-computer interaction. Pearson Education, 2003. • Norman, D. A. (2004). Emotional design: Why we love (or hate) everyday things. Civitas Books. • Holmqvist, K., Nyström, M., Andersson, R., Dewhurst, R., Jarodzka, H., & Van de Weijer, J. (2011). Eye tracking: A comprehensive guide to methods and measures. OUP Oxford. <p><i>Selected papers from ACM Conference on Computer Human Interaction (CHI), ACM Conference on Intelligent User Interfaces, Foundations and Trends in Human-Computer Interaction journal (ISSN 15513963, 15513955) and other relative scientific conferences and journals.</i></p>

HCI202: Design of Web Applications (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Postgraduate Program		
COURSE CODE	HCI202	SEMESTER OF STUDY	2nd
COURSE TITLE	Design of web applications		
INDEPENDENT TEACHING ACTIVITIES <i>where credit is awarded for discrete parts of the course e.g. lectures, laboratory exercises, etc. If credit is awarded for the whole course, indicate the weekly teaching hours and the total number of credits</i>	TEACHING HOURS	CREDITS	
lectures	26	1.8	
Laboratory exercises	12	1.2	
Project work	6	3.0	
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF TEACHING and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/HCI110/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area - Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B - Comprehensive Guide to the Writing of Learning Outcomes 														
<p>Introduction to web technology and application domains, perspectives. protocols, web server technologies. Developing usable web applications: Programming on the client-side (HTML, CSS, JavaScript). The course includes practical work on web interface design and evaluation of web applications. Upon completion of this course, the students should be familiar with the fundamental concepts of web architecture and modern web application development technologies and be able to use the appropriate web application design technologies in order to design and build modern web applications.</p>														
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table border="0"> <tr> <td><i>Adaptation to new situations</i></td> <td><i>Respect for diversity and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Autonomous work</i></td> <td><i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i></td> </tr> <tr> <td><i>Group work</i></td> <td><i>Exercise of criticism and self-criticism</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Promotion of free, creative and deductive thinking</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td><i>..... Other...</i></td> </tr> <tr> <td><i>Generating new research ideas Project planning and management</i></td> <td></td> </tr> </table>	<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>	<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>	<i>Generating new research ideas Project planning and management</i>	
<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>													
<i>Decision-making</i>	<i>Respect for the natural environment</i>													
<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>													
<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>													
<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>													
<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>													
<i>Generating new research ideas Project planning and management</i>														
<p>Group work, Demonstrating social, professional and ethical responsibility and gender sensitivity, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas Project planning and management</p>														

(3) COURSE CONTENT

Module 1 - Introduction - Internet Protocols, History of the web, protocols, HTTP
 Module 2. HTML - This module is taught in the 2nd week. It includes basic HTML elements including <table> and <form> tags
 Module 3. CSS - Introduction to Cascading Style Sheets CSS3 technology
 Module 4. Bootstrap - Introduction to the bootstrap framework that allows for the design of applications for different device sizes (responsive design).
 Module 5. JavaScript on the browser side - Introduction to JavaScript programming language used as client and server-side language. The basic syntax and language data types will be introduced, as well as the API with the HTML and CSS and the DOM.
 Module 6. Programming the server with JavaScript - Introduction to the node.js / express.js framework that allows us to create a server using the Javascript language. We will cover topics such as database interface, requests routing, form data management, REST APIs

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
ORGANISATION OF TEACHING <i>Means and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i> <i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	26
	Project work	64
	Exam - assignment	20
	Self-study	40
STUDENT ASSESSMENT <i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	40% Lab. The final lab exam counts for 50% of the final lab grade. 30% Assignment - project 30% final written exam. The examination includes theory questions of open and closed questions.	

(5) RECOMMENDED-BIBLIOGRAPHY

D. Flanagan, *JavaScript: The Definitive Guide, Seventh Edition, O'Reilly Media, 2020*
 M. Frisbie, *Professional Javascript for Web Developers, John Wiley & Sons, 2020.*
 J. Dean, *Web Programming with HTML5, CSS, and JavaScript, Jones & Bartlett Learning, 2019*

HCI203: Speech and Natural Language Processing (elective)

1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	ELECTRICAL AND COMPUTER ENGINEERING		
LEVEL OF COURSE	POSTGRADUATE		
COURSE CODE	HCI203	SEMESTER OF STUDY	2nd
COURSE TITLE	Speech and Natural Language Processing		
INDEPENDENT TEACHING ACTIVITIES 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		TEACHING HOURS PER WEEK	ECTS CREDITS
Lectures		3 x 13 weeks	3
Labs		2 x 13 weeks	3
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>		5 x 13 weeks	6
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	specialised general knowledge		
PREREQUISITE COURSES:			
TEACHING AND ASSESSMENT LANGUAGE:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBPAGE (URL)	https://eclass.upatras.gr/courses/EE930/		

2. LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Learning outcomes: At the end of this course, students will be able to know the following: Levenshtein Distance. Regular Expressions. Automatic Finite Automata (FSA) and Transducers. Morphological Processing. Formal Languages and Grammars. Stochastic Language Models. Informational modeling. Modeling the production and speech perception mechanism. Digital speech signal pre-processing. Acoustic parameters. Speech encoding in the time and frequency domain. Artificial Neural Networks. Speech recognition and speaker

identification systems. Speech Synthesis. Applications.

Competences: During the laboratory, students learn to use specialized tools like JFLAP and Audacity.

General Abilities

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?

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

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Adapting to new situations
- Decision-making
- Working independently

3. COURSE CONTENT

The syllabus includes: Stages of Language Processing, Coding, Levenshtein Distance, Optimal Paths on the Levenshtein Matrix, Multiple Paths at the Levenshtein Matrix, Regular Expressions, Finite State Automata (FSA), Transition from Regular Expressions to FSA, FSA Types: Cyclic, Acyclic, Deterministic, Mathematical Definition of Automata, FSA Extensions: Twins, Parallel, Transducers, FSA Applications, Morphological Analysis, the Morphological Model of Kay-Kaplan, the Two-Level Morphological Model, Formal Languages and Grammars, Chomsky Hierarchy, Chomsky Normal Form (CNF), CKY Algorithm, Logarithms and Logprobs, Probabilistic Type-2 Grammars, Text Corpora Categories, PCFG to CNF Conversion, Probabilistic CKY, Language Models, Bigram Count Matrix, Bigram Probabilities Matrix, Laplace Smoothing, Backoff, Interpolation, Trigram Count Matrix, Language Model Files, Spell-Check Correction with Language Models, Entropy and Perplexity, Text Classification with Compression, WordNet. Speech production modeling: Speech production mechanism, Speech sounds, Speech production model. Digital speech signal pre-processing: Selection of sampling frequency, Digitization, Short-term speech signal analysis, Frame length selection, Pre-emphasis, Window filter selection, Frame movement rate. Acoustic Parameters: Energy, Zero Transitions, Fundamental Frequency, Pitch Estimation Methods, Spectrum analysis, Formants, Linear Prediction Coefficients (LPC), Filter Bank, Reflection Coefficients, Cepstral Coefficients. Speech Processing Techniques: Auditory Pattern Matching, Dynamic Time Warping (DTW), Vector Quantization, K-means Algorithm, VQ Codebook with Density Mixing, Hidden Markov Models (HMM) Modeling, Forward-Backward Algorithm, Viterbi Algorithm. Speech recognition systems. Speaker recognition systems. Speech Synthesis: Basic Principles, Unit Size, Unit Types, Synthesis Methods, Limited vs Unlimited Vocabulary Systems. Synthesis with Formants, LPC synthesis, Modeling of the source of stimulation, Prosody Modeling, Evaluation of the LPC model by sample-sample procedure, Modeling the speech signal with poles and zeros, Methods of calculating the parameters of the ARMA model, Problems of the ARMA model. Digital noise filtering techniques. Speech coding: Techniques for coding the speech waveform (time domain), Coding using the speech spectrum (frequency domain), Coding techniques using analysis-synthesis (frequency domain), Linear prediction coding.

4. TEACHING AND LEARNING METHODS – ASSESSMENT

TEACHING METHOD <i>Face-to-face, Distance learning, etc.</i>	Face to face and/or distance learning
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<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>The course is supported by an e-learning site at eclass.upatras.gr through which the course material, exercises, slides, announcements, laboratories, examinations, additional instructions and other useful material are shared.</p>	
<p>TEACHING ORGANIZATION <i>The manner and methods of teaching are described in detail. 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. 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>	Activity	Semester Work Load
	Lectures recitations	26
	Exercises	13
	Laboratory practice	26
	Personal study	82
	Examinations	3
<p>STUDENT ASSESMENT <i>Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>The students are examined by written examination at the end of the semester. The examination is conducted with open books. Their presences are accounted at laboratory exercises during which students are also examined. In order for students to participate in the examination of the course, they must have completed the minimum attendance at the laboratory (at least 2/3 of the total).</p>	

5. RECOMMENDED LITERATURE

- Suggested bibliography: textbook:

- "Discrete-time processing of speech signals", J.R.Deller, J.G.Proakis, J.H.L.Hansen, Macmillan Publishing Company, New York (1993)
- "Speech synthesis and recognition", J.N.Holmes, Wokingham: Van Nostrand Reinhold Co Ltd, c1988
- "Speech and Language Processing" (2ed), D. Jurafsky, J.H. Martin, Prentice Hall/Pearson, 2010
- "Natural Language Processing with Python", S. Bird, E. Klein, E. Loper, O'Reilly, 2009

- Related academic journals:

- "Computational Linguistics", MIT Press, ISSN: 0891-2017
- "IEEE Transactions on Audio, Speech, and Language Processing", IEEE, ISSN: 1558-7916

HCI205: Ubiquitous Computing (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI205	SEMESTER OF STUDY	2nd
COURSE TITLE	Ubiquitous Computing		
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>	TEACHING HOURS	CREDITS	
lectures	26	1.8	
Laboratory exercises	6	1.2	
Project work	6	3.0	
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - <i>Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area</i> - <i>Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B</i> - <i>Comprehensive Guide to the Writing of Learning Outcomes</i> 		
<p>Upon completion of this course, the student will have:</p> <ul style="list-style-type: none"> • Acquired theoretical knowledge related to ubiquitous computing applications • Acquired theoretical knowledge and practical skills related to standards and best practices for developing ubiquitous computing applications • Understand the process of embracing user centered design methodologies for creating interactive experiences within pervasive computing realms • Developed practical skills in eliciting user requirements and transform them into system specifications for ubiquitous computing realms • Developed practical skills for programming ubiquitous computing applications that embrace Internet of Things (IoT) technology and mobile application frameworks 		
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas</i> <i>Project planning and management</i> </td> <td style="width: 50%; border: none;"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i> </td> </tr> </table>	<i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas</i> <i>Project planning and management</i>	<i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i>
<i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas</i> <i>Project planning and management</i>	<i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i>	

Group work, Demonstrating social, professional and ethical responsibility and gender sensitivity, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas Project planning and management

(3) SYLLABUS

- **THEORETICAL BACKGROUND**
- UNIT 1. Introduction - Theoretical foundations of ubiquitous computing
- UNIT 2. Theoretical foundations of pervasive computing & internet of things
- UNIT 3. Designing & evaluation of interactive experiences in ubiquitous computing environments
- UNIT 4. Case studies review in education, entertainments, environment, working
- UNIT 5. *Project assignments*
- **PRACTICAL SESSIONS**
- UNIT 6. Designing pervasive mobile applications- Online seminars
- UNIT 7. Prototyping pervasive mobile applications- Online seminars
- UNIT 8. Evaluating pervasive IoT applications - Online seminars
- UNIT 9. Prototyping pervasive IoT applications - Online seminars
- UNIT 10. Project presentations

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
TEACHING METHODS <i>Means and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc. Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	26
	Practicals – lab work	6
	Project work	64
	Exam - assignment	22
	Self-study	32
	Total Course	150 (6 ECTS)
STUDENT ASSESSMENT <i>Description of the assessment procedure Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	20% practicals, 50% Design and evaluation of an interactive system (project), 30% Essay on an area of the course, oral presentation	

(5) RECOMMENDED-BIBLIOGRAPHY

Designing the Internet of Things

[https://books.google.com/books/about/Designing_the_Internet_of_Things.html?id=af11AQAQB
AJ&source=kp_book_description](https://books.google.com/books/about/Designing_the_Internet_of_Things.html?id=af11AQAQB
AJ&source=kp_book_description)

Smart Things: Ubiquitous Computing User Experience Design

[https://books.google.gr/books/about/Smart_Things.html?id=-
WLyUCBBUVAC&source=kp_book_description&redir_esc=y](https://books.google.gr/books/about/Smart_Things.html?id=-
WLyUCBBUVAC&source=kp_book_description&redir_esc=y)

Selected papers from ACM Conference on Computer Human Interaction (CHI)

HCI206: Creative Design Lab (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Postgraduate Program		
COURSE CODE	HCI206	SEMESTER OF STUDY	2nd
COURSE TITLE	Creative Design Lab		
INDEPENDENT TEACHING ACTIVITIES <i>where credit is awarded for discrete parts of the course e.g. lectures, laboratory exercises, etc. If credit is awarded for the whole course, indicate the weekly teaching hours and the total number of credits</i>		TEACHING HOURS	CREDITS
Weekly teaching hours (consisting of lectures, lab workshop exercises, Project work)		3	6
Total teaching hours for 12 teaching weeks		36	6
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	general knowledge, skill development		
PREREQUISITE COURSES:	None		
LANGUAGE OF TEACHING and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/NOC3065/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area - Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B - Comprehensive Guide to the Writing of Learning Outcomes 		
<p>Upon completion of this course, the student should be familiar with the basic creative design methods that can be used in the first parts of a design process (ideation phase), they will be acquainted to several ideation techniques, and will additionally have basic knowledge of semantics and of design thinking.</p> <p>At the end of the course students will know several design techniques to choose from and will be able to organize and to participate in a design ideation workshop. They will also be able to semantically analyze works of communication design, and work within multidisciplinary teams that include creative design perspective.</p>		
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i> </td> </tr> </table>	<ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> 	<ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i>
<ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> 	<ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i> 	
<p>Group work, Exercise of criticism and self-criticism, Promotion of creative thinking, Generating new research ideas, Project planning and management</p>		

(3) COURSE CONTENT

UNIT 01: Introduction to creative thinking
 UNIT 02: About the design process
 UNIT 03: Meaning and semantic language in visual communication
 UNIT 04: Scenario based design (as theoretical backbone to a lot of ideation techniques)
 UNIT 05: Concept generation Techniques
 Unit 06: Ideation games with cards
 Unit 07: Enacting methods
 Unit 08: Critical Design, Speculative Design
 Unit 09: Reflection on Early design, processes and techniques involved in concept phase
 Unit 10: Creative Workshop practice sessions / Invited thematic presentations

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Mixed (Face-to-face and distance learning)	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
ORGANISATION OF TEACHING <i>Means and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i> <i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	18
	Practicals – lab work	18
	Project work	56
	Exam - assignment	10
	Self-study	48
	Total Course	150 (6 ECTS)
STUDENT ASSESSMENT <i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	50% practical project work, 30% Report on an area of the course, 20% Oral presentation	

(5) RECOMMENDED-BIBLIOGRAPHY

Kumar, V. (2012). *101 design methods: A structured approach for driving innovation in your organization*. John Wiley & Sons.
 Selected chapters from: *Collaboration in Creative Design*, ed: Markopoulos, Martens, Malins, Coninx, Liapis, Springer 2016
 Selected ACM, IEEE papers
 Selected material from internet resources (including TED lectures)

HCI207: Front-end Web Programming (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Postgraduate Program		
COURSE CODE	HCI207	SEMESTER OF STUDY	2nd
COURSE TITLE	Front-end web programming		
INDEPENDENT TEACHING ACTIVITIES <i>where credit is awarded for discrete parts of the course e.g. lectures, laboratory exercises, etc. If credit is awarded for the whole course, indicate the weekly teaching hours and the total number of credits</i>		TEACHING HOURS	CREDITS
lectures		26	1.8
Laboratory exercises		6	1.2
Project work		6	3.0
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF TEACHING and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/HCI110/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area - Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B - Comprehensive Guide to the Writing of Learning Outcomes 														
<p>Front-end web programming concerns the development of interfaces with the web stack technologies, which is currently used for the development of a wide variety of applications, eg conventional websites, graphical interfaces in the conventional sense, desktop applications, mobile applications etc.</p>														
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table border="0"> <tr> <td><i>Adaptation to new situations</i></td> <td><i>Respect for diversity and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Autonomous work</i></td> <td><i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i></td> </tr> <tr> <td><i>Group work</i></td> <td><i>Exercise of criticism and self-criticism</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Promotion of free, creative and deductive thinking</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td><i>..... Other...</i></td> </tr> <tr> <td><i>Generating new research ideas Project planning and management</i></td> <td></td> </tr> </table>	<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>	<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>	<i>Generating new research ideas Project planning and management</i>	
<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>													
<i>Decision-making</i>	<i>Respect for the natural environment</i>													
<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>													
<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>													
<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>													
<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>													
<i>Generating new research ideas Project planning and management</i>														
<p>Group work, Demonstrating social, professional and ethical responsibility and gender sensitivity, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas Project planning and management</p>														

(3) COURSE CONTENT

The first part of the course offers an in-depth refresh of the technologies that constitute the basic web stack. Subsequently, more advanced topics related to Javascript programming will be discussed as well as the use of canvas to create graphical interaction interfaces, such as e.g. games. The last part of the course concerns the development of complex interfaces with React.

1. Introduction, tools, hosting
2. Modern HTML, CSS, JS,
3. Forms design and validation at the front-end and back-end,
4. Modern CSS layout with flexbox and CSS grid,
5. Advanced Bootstrap,
6. Graphic elements and game developing using canvas,
7. Asynchronous JS and fetch API,
8. Introduction to React framework: components design,
9. JSX, state management, hooks,
10. GraphQL.

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
ORGANISATION OF TEACHING <i>Means and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc. Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	26
	Project work	64
	Exam - assignment	20
	Self-study	40
	Total Course	150 (6 ECTS)
STUDENT ASSESSMENT <i>Description of the assessment procedure Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	<p>During the course a number of projects will be developed.</p> <p>Evaluation will be based on</p> <ul style="list-style-type: none"> • the delivered and demonstrated project work • mini tests on various modules of the course <p>Project outline Projects are assigned during the the course, which are important for assessment. Project schedule may change during the semester, but an estimated outline is:</p> <ul style="list-style-type: none"> • (modules 1-4): Build a website from scratch, i.e. without using any frameworks, such as bootstrap or any javascript framework. [2 weeks] • (module 5): Refactor the front-end using bootstrap [1 week] • (module 7): Graphics application using canvas [2 weeks] • (module 9): Re-implement first project using react [2 weeks] <p>Additional mini projects might be added.</p>	

(5) RECOMMENDED-BIBLIOGRAPHY

A. Banks and E. Porcello, Learning React, O'Reilly Media, 2020
A. Boduch, React and React Native, Packt Publ. 2017

HCI208: Designing of Location-based Applications (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Postgraduate Program		
COURSE CODE	HCI208	SEMESTER OF STUDY	2nd
COURSE TITLE	Designing of location-based applications		
INDEPENDENT TEACHING ACTIVITIES <i>where credit is awarded for discrete parts of the course e.g. lectures, laboratory exercises, etc. If credit is awarded for the whole course, indicate the weekly teaching hours and the total number of credits</i>		TEACHING HOURS	CREDITS
lectures		26	1.8
Laboratory exercises		6	1.2
Project work		6	3.0
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF TEACHING and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/NOC3076/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area - Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B - Comprehensive Guide to the Writing of Learning Outcomes 		
<p>The objective of this course, is to introduce the students to location-based applications the theoretical background and the challenges relating of designing such applications.</p> <p>Key characteristics of this genre are introduced first, followed by a design framework and a set of design guidelines.</p> <p>Examples of location-based applications will be presented and typical design patterns as extracted from previous research will be discussed.</p>		
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i> </td> </tr> </table>	<ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> 	<ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i>
<ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> 	<ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i> 	
<p>Group work, Demonstrating social, professional and ethical responsibility and gender sensitivity, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas Project planning and management</p>		

(3) COURSE CONTENT

- Unit1 – Introduction
- Unit2 – Mobile Computing
- Unit3 – Location matters
- Unit4 – Location-based games 1
- Unit5 – Location-based games 2
- Unit6 – Location-based games 3
- Unit7 – Learning and social dimensions
- Unit8 - Participating activities and narratives
- Unit9 – On the design of location-based applications

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
ORGANISATION OF TEACHING <i>Means and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i> <i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	26
	Project work	64
	Exam - assignment	20
	Self-study	40
	Total Course	150 (6 ECTS)
STUDENT ASSESSMENT <i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	<ul style="list-style-type: none"> •40% project •20% mapping mini project •20% essay •20% mini-test 	

(5) RECOMMENDED-BIBLIOGRAPHY

- Haahr, M. (2018). Reconciling immersion and presence: Locative game mechanics and narrative techniques for cultural heritage. *Virtual Creativity*, 8(1), 23-37.
- V. Kasapakis, D. Gavalas, Pervasive gaming: Status, trends and design principles, *Journal of Network and Computer Applications* 55 (2015) 213–236.
- Kjeldskov, J., & Paay, J. (2007). Augmenting the City with fiction: fictional requirements for mobile guides. *Mobile Interaction with the Real World*, 5, 41-55.
- Adams E. (2010), *Fundamentals of Game Design*, 2nd Edition, New Riders.
- Spallazzo and Mariani, 2018, chapter 2: LBMG in a nutshell
- Selected papers from ACM Conference on Computer Human Interaction (CHI)*

HCI209: Introduction to Human-Robot Interaction (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI209	SEMESTER OF STUDY	2nd
COURSE TITLE	Introduction to Human-Robot Interaction		
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>		TEACHING HOURS	CREDITS
lectures		26	1.8
Laboratory exercises		5	1.2
Project work		12	3.0
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	Specialized general knowledge		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/CEID1260/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - <i>Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area</i> - <i>Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B</i> - <i>Comprehensive Guide to the Writing of Learning Outcomes</i>
<p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Recognize the use of robots today and the areas where HRI is important. • Understand the design process of HRI systems and why usability is important • Design solutions for HRI applications where is the critical transition point from autonomous to teleoperated or vice versa. • Design small scale HRI applications working on robotic platform simulations. • Apply basic statistical analysis methods (using proper tools such as SPSS) to analyse data from HRI experiments, such as: <ul style="list-style-type: none"> ○ Data preparation and data cleaning ○ Descriptive statistics ○ Preform significance tests (both parametric and non-parametric)

General competences

Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?

Adaptation to new situations

Decision-making

Autonomous work

Group work

Working in an international environment

Working in an interdisciplinary environment

Generating new research ideas Project planning and management

Respect for diversity and multiculturalism

Respect for the natural environment

Demonstrating social, professional and ethical responsibility and gender sensitivity

Exercise of criticism and self-criticism

Promotion of free, creative and deductive thinking

..... Other...

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Team work
- Project planning and management
- Showing social, professional and ethical responsibility and sensitivity to gender issues
- Production of free, creative and inductive thinking

(3) SYLLABUS

The course is based on the following UNITS:

UNIT 1: Basics of HRI

- b. Foundations of Human-Computer Interaction
- c. Introduction to robots today
- d. The design process and usability
- e. The critical transition point from autonomous to teleoperated

UNIT 2: Research Methods in HRI

- a. 2.1 Descriptive statistics for HRI
- b. 2.2 Data preparation and significance tests for HRI
- c. 2.3 Parametric and non-parametric test for HRI

UNIT 3: Applications of HRI today

- a. Applications of HRI in Smart Cities
- b. Human-robot coexistence in the urban environment
- c. Pioneering smart cities using robots and major smart city initiatives that include robots

UNIT 4: Practical work on a robotic platform (project / simulation)

(4) TEACHING AND LEARNING METHODS - EVALUATION

<p>MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i></p>	Face-to-face	
<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i></p>	Lectures will use slides that will be available through the university LMS (eClass). Content provision and communication with the professors and peers will also be through eClass (messages and e-forum).	
<p>TEACHING METHODS <i>Means and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i> <i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i></p>	Activity	Workload
	Lectures	26
	Recitation	26
	Project A (paper essay)	30
	Study and analysis of bibliography	20
	Project B (robot simulation)	50
	Total Course	152 (6 ECTS)
<p>STUDENT ASSESSMENT <i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i></p>	50% assessment of the project A and 50% assessment of the project B	

(6) RECOMMENDED-BIBLIOGRAPHY

<p>Suggested bibliography</p> <ul style="list-style-type: none"> • Human{Robot Interaction, An Introduction, Christoph Bartneck, Tony Belpaeme, Friederike Eysel, Takayuki Kanda, Merel Keijsers, Selma Sabanovi <p>Relative Scientific Journals</p> <ul style="list-style-type: none"> • ACM Human-Robot Interaction (THRI) • ACM Transactions on Computer-Human Interaction (TOCHI)
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HCI210: Statistical Methods in Human-Computer Interaction (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Postgraduate Program		
COURSE CODE	HCI210	SEMESTER OF STUDY	2nd
COURSE TITLE	Statistical Methods in Human-Computer Interaction		
INDEPENDENT TEACHING ACTIVITIES <i>where credit is awarded for discrete parts of the course e.g. lectures, laboratory exercises, etc. If credit is awarded for the whole course, indicate the weekly teaching hours and the total number of credits</i>		TEACHING HOURS	CREDITS
lectures		33	1.8
Laboratory exercises		6	1.2
Project work		6	3.0
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	Probability Theory		
LANGUAGE OF TEACHING and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/modules/document/?course=HCI111		

(2) LEARNING OUTCOMES

<p>Learning Outcomes <i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i> <i>Consult Annex A</i> <i>- Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area</i> <i>- Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B</i> <i>- Comprehensive Guide to the Writing of Learning Outcomes</i></p>															
<p>Upon completion of this course, the student should be familiar with a broad range of statistical techniques and how to implement them using some statistical package. More specifically the students should be capable to do a complete analysis of experimental data starting from an exploratory analysis with descriptive statistics, proceeding with the selection of suitable statistical inference tools (parametric and non-parametric) and reaching to the usage of more specialized techniques such as regression, principal component analysis, factor analysis or clustering. Emphasis is given to choosing the right statistical techniques and to correctly interpreting the results.</p>															
<p>General competences <i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table border="0"> <tr> <td><i>Adaptation to new situations</i></td> <td><i>Respect for diversity and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Autonomous work</i></td> <td><i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i></td> </tr> <tr> <td><i>Group work</i></td> <td><i>Exercise of criticism and self-criticism</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Promotion of free, creative and deductive thinking</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td><i>..... Other...</i></td> </tr> <tr> <td><i>Generating new research ideas Project planning and management</i></td> <td></td> </tr> </table>		<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>	<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>	<i>Generating new research ideas Project planning and management</i>	
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<p>Autonomous work and also Group work, Decision-making, Generating new research ideas, Project planning and management, Search for data through different platforms and sources, Communicate technical results to non-technical people.</p>															

(3) COURSE CONTENT

UNIT 01: Introduction to statistics and data analysis; descriptive statistics
 UNIT 02: Statistical inference with confidence intervals and hypothesis testing
 UNIT 03: One- and Two-way ANOVA
 UNIT 04 Simple Regression Analysis
 UNIT 05: Multiple Regression Analysis
 UNIT 06: Chi-square tests (Goodness of fit test, test of independence, test of Homogeneity, test for equality of several proportions)
 UNIT 07: Non-parametric statistics ((Wilcoxon, Mann- Whitney, Kruskal - Wallis, Friedman tests)
 UNIT 08: Principal Component Analysis
 UNIT 09: Factor Analysis
 UNIT 10: Clustering

(4) TEACHING AND LEARNING METHODS - EVALUATION

MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i>	The SPSS statistical package will be used for all practical exercises and demonstrations of statistical techniques; content is delivered through the institutional learning management system (eclass)	
ORGANISATION OF TEACHING <i>Means and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i> <i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i>	Activity	Workload
	Lectures	33
	lab work	7
	Project work	45
	Two Assignments	30
	Self-study	35
	Total Course	150 (6 ECTS)
STUDENT ASSESSMENT <i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i>	25% each assignment, 30% Design and execution of a data analysis project, 20% presentation of the project	

(5) RECOMMENDED-BIBLIOGRAPHY

- Probability and Statistics for Engineers and Scientist - 9th Edition, 2011, by R.E.Walpole, R.H.Myers, S.L.Myers, K.Ye
- Discovering Statistics Using IBM SPSS Statistics, by A. Field, 2013, 4th Edition

HCI211: Human-Brain Interaction (elective)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI211	SEMESTER OF STUDY	2nd
COURSE TITLE	Human-Brain Interaction		
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>	TEACHING HOURS	CREDITS	
lectures	26	1.8	
Laboratory exercises	6	1.2	
Project work	6	3.0	
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>	specialized background		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION:	English/Greek teaching – English examination		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/HCI113/		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area - Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B - Comprehensive Guide to the Writing of Learning Outcomes 		
<p>The aim of the course is the theoretical and empirical training of students in the interdisciplinary research field of the Brain - Computer interface (Brain – Computer Interface (BCI)). A brain-computer interface is defined as a computer system that receives brain signals, which it analyses - extracting features and training machine learning models - and then translates them into commands that that can be understood by the computer.</p> <p>Upon completion of this course, the student should be familiar with the basic theoretical principles that govern the BCI interaction of the user with machines in the modern world. He/she should also be familiar with the applied BCI protocols, and frameworks for designing and development of BCI software systems.</p>		
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> </td> <td style="width: 50%; border: none;"> <ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i> </td> </tr> </table>	<ul style="list-style-type: none"> <i>Adaptation to new situations</i> <i>Decision-making</i> <i>Autonomous work</i> <i>Group work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Generating new research ideas Project planning and management</i> 	<ul style="list-style-type: none"> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i> <i>Exercise of criticism and self-criticism</i> <i>Promotion of free, creative and deductive thinking</i> <i>..... Other...</i>
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<p>Group work, Demonstrating social, professional and ethical responsibility and gender sensitivity, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas Project planning and management</p>		

(3) SYLLABUS

<p>I. Introduction</p> <p>II. Theoretical Foundations / EEG-Protocols</p> <p>III. Theoretical Foundations / EEG-Signal Acquisition</p> <p>IV. Theoretical Foundations / Preprocessing</p> <p>V. Theoretical Foundations / Feature Extraction</p> <p>VI. Theoretical Foundations / Classification</p> <p>VII. Designing Interactive Experiences in BCI Contexts</p> <p>VIII. Evaluation of BCI Interactive Systems</p> <p>IX. Case studies review in education, entertainments, environment, working</p> <p>X. Prototyping BCI applications- Interactive Courses (A)</p> <p>XI. Prototyping BCI applications - Practical Session (A)</p> <p>XII. Prototyping BCI applications - Practical Session (B)</p>
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(4) TEACHING AND LEARNING METHODS - EVALUATION

<p>MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i></p>	Face-to-face	
<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i></p>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
<p>TEACHING METHODS <i>Means and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc.</i> <i>Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i></p>	<p>Activity</p>	<p>Workload</p>
	Lectures	26
	Practicals – lab work	6
	Project work	64
	Exam - assignment	20
	Self-study	34
	Total Course	150 (6 ECTS)
<p>STUDENT ASSESSMENT <i>Description of the assessment procedure</i> <i>Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others</i> <i>Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i></p>	20% practicals, 50% Design and evaluation of an interactive system (project), 30% Essay on an area of the course, oral presentation	

(5) RECOMMENDED-BIBLIOGRAPHY

<p><i>Brain-Computer Interfaces 2: Technology and Applications</i> <i>Maureen Clerc, Laurent Bougrain, Fabien Lotte · 2016</i> <i>Selected papers from ACM Conference on Computer Human Interaction (CHI)</i></p>

HCI301: Master Thesis (compulsory)

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering (leader) and Computer Engineering and Informatics		
LEVEL OF STUDY	Postgraduate Program		
POSTGRADUATE PROGRAMME	Master in Human-Computer Interaction		
COURSE CODE	HCI301	SEMESTER OF STUDY	3rd
COURSE TITLE	Master Thesis		
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>		TEACHING HOURS	CREDITS
Personal Project work		0	30
TYPE OF COURSE <i>general background, specialized background, specialization, general knowledge, skill development</i>		Skill and competences development	
PREREQUISITE COURSES:		All courses of 1 st and 2 nd semester	
LANGUAGE OF INSTRUCTION and EXAMINATION:	English		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	-		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>The learning outcomes of the course are described as the specific knowledge, skills and competences of an appropriate level that students will acquire upon successful completion of the course.</i></p> <p><i>Consult Annex A</i></p> <ul style="list-style-type: none"> - <i>Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area</i> - <i>Descriptive Indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B</i> - <i>Comprehensive Guide to the Writing of Learning Outcomes</i> 														
<p>The objective of this large scale personal project is to study a problem of human-computer interaction and design an innovative solution to it using theoretical knowledge and skills acquired by the courses of the first and second semester of the Programme.</p>														
<p>General competences</p> <p><i>Taking into account the general competences that the graduate should have acquired (as listed in the Diploma Supplement and listed below), which one(s) does the course aim at?</i></p> <table border="0"> <tr> <td><i>Adaptation to new situations</i></td> <td><i>Respect for diversity and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Autonomous work</i></td> <td><i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i></td> </tr> <tr> <td><i>Group work</i></td> <td><i>Exercise of criticism and self-criticism</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Promotion of free, creative and deductive thinking</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td><i>..... Other...</i></td> </tr> <tr> <td><i>Generating new research ideas Project planning and management</i></td> <td></td> </tr> </table>	<i>Adaptation to new situations</i>	<i>Respect for diversity and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Autonomous work</i>	<i>Demonstrating social, professional and ethical responsibility and gender sensitivity</i>	<i>Group work</i>	<i>Exercise of criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Promotion of free, creative and deductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>..... Other...</i>	<i>Generating new research ideas Project planning and management</i>	
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<p>Demonstrating social, professional and ethical responsibility and gender sensitivity, Exercise of criticism and self-criticism, Promotion of free, creative thinking, Generating new research ideas Project planning and management</p>														

(3) SYLLABUS

The Master Thesis is undertaken during the third semester of studies, under the supervision of one of the faculty members of participating departments. A list of areas of research will be announced. Students will be encouraged to do part of their thesis work in industry or collaborating institutions in Greece or abroad. The Thesis is presented publicly and examined and approved by a three-member examination board, chaired by the Thesis supervisor.

(4) TEACHING AND LEARNING METHODS - EVALUATION

<p>MODE OF DELIVERY <i>Face-to-face, distance learning, etc.</i></p>	Face-to-face	
<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory training, communication with students</i></p>	In the practical exercises various software and devices are used, content is delivered through the institutional learning management system (eclass)	
<p>TEACHING METHODS <i>Means and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Analysis of Literature, Tutorials, Practical (Placement), Clinical Exercise, Artistic Workshop, Interactive teaching, Educational visits, Study visits, Project work, Writing of work / assignments, Artistic creation, etc. Indicate the student's study hours for each learning activity as well as the hours of unguided study according to ECTS principles.</i></p>	Activity	Workload
	Project work	745
	Public presentation	5
<p>STUDENT ASSESSMENT <i>Description of the assessment procedure Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Test, Short Answer Questions, Test Development Questions, Problem Solving, Written Work, Report/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other / Others Explicitly identified assessment criteria are stated and if and where they are accessible to students.</i></p>	Assessment of Thesis and Public presentation of the thesis work by three-member committee	

(5) RECOMMENDED-BIBLIOGRAPHY

Depends on the subject of the thesis