(1) GENERAL

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>School of Engineering, University of Patras</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIC UNIT</td>
<td>Department of Computer Engineering and Informatics</td>
</tr>
<tr>
<td>LEVEL OF STUDIES</td>
<td>Undergraduate Obligatory</td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>CEID_NY134</td>
</tr>
<tr>
<td>SEMESTER</td>
<td>SPRING (2o)</td>
</tr>
<tr>
<td>COURSE TITLE</td>
<td>OBJECT ORIENTED PROGRAMMING</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>WE eeklying TEACHING HOURS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>3</td>
</tr>
<tr>
<td>Tutorials</td>
<td>2</td>
</tr>
<tr>
<td>Lab Sessions (Project)</td>
<td>2</td>
</tr>
</tbody>
</table>

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).

COURSE TYPE
- Specialised general knowledge and skills development

PREREQUISITE COURSES:
There are no prerequisite courses. Recommended background knowledge: basic knowledge in Algorithms Design and Programming (CEID_NY131).

LANGUAGE OF INSTRUCTION and EXAMINATIONS:
Greek. Instruction may be given in English if foreign students attend the course.

IS THE COURSE OFFERED TO ERASMUS STUDENTS: YES

COURSE WEBSITE (URL) https://eclass.upatras.gr/courses/CEID1105/

(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 the student will be able to:
- describe the concepts of object, class, instance, subclass, superclass, member variable, method, inheritance
- design a class hierarchy and implement it in Java and C ++
- design and implement classes and methods in Java and C ++
- use Java and C ++ libraries • handle files via Java and C ++
- design and implement simple graphical user interfaces using corresponding Java and C ++ toolboxes
- design an object-oriented program from the description of the problem
- implement an object-oriented program in Java and C ++
- explain an object-oriented program written in Java or C ++

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

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- 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...

(3) SYLLABUS

- Introduction to Java. Definition of classes, instances. Methods and variables. Java and C
- Basic Java library
- Inheritance, Polymorphism in Java
- Handling exceptions in Java.
- Input-Output in Java-File Handling
- Threads - Concurrent programming
- Graphical User Interfaces. Handling of Events in Java
- Java applets
- Introduction to C++. Basic elements of C++
- Data abstraction-Classes
- Class Hierarchies and Inheritance. Derived classes. Polymorphism
- S. Handling exceptions
- C++ library
- Designing Object Oriented Programs. Objectives and design process. Design of class hierarchies and interfaces.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<thead>
<tr>
<th>DELIVERY</th>
<th>Face-to-face, Distance learning, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td>
<td>Information and Communications Technologies are used in communicating with students. We use: eclass, email and forum.</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>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-</td>
</tr>
<tr>
<td>Activity</td>
<td>Semester workload</td>
</tr>
<tr>
<td>Lectures</td>
<td>90 h</td>
</tr>
<tr>
<td>Tutorials</td>
<td>60 h</td>
</tr>
<tr>
<td>Lab Sessions (Projects)</td>
<td>60 h</td>
</tr>
</tbody>
</table>
directed study according to the principles of the ECTS

| Course total | 210 h |

**STUDENT PERFORMANCE EVALUATION**

**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.

- Written examination (60% of the total grade)
- Laboratory Exercises (25% of the total grade).
- Work-Project Preparation (15% of the total grade)

(5) ATTACHED BIBLIOGRAPHY

- **Suggested bibliography:**
  - Γιώργος Λιακέας. Εισαγωγή στη JAVA. Κλειδάριθμο ΕΠΕ, Αθήνα, 2008.
  - Stroustrup Bjarne. Η Γλώσσα Προγραμματισμού C++. Ι. Φαλδάμης & ΣΙΑ ΕΕ, Αθήνα, 2014.

- **Related academic journals:**
  - Γιώργος Λιακέας. Εισαγωγή στη JAVA. Κλειδάριθμο ΕΠΕ, Αθήνα, 2008.
  - Stroustrup Bjarne. Η Γλώσσα Προγραμματισμού C++. Ι. Φαλδάμης & ΣΙΑ ΕΕ, Αθήνα, 2014.