### COURSE OUTLINE

#### (1) GENERAL

<table>
<thead>
<tr>
<th>SCHOOLS</th>
<th>ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIC UNIT/UNITS</td>
<td>COMPUTER ENGINEERING AND INFORMATICS DEPARTMENT,</td>
</tr>
<tr>
<td>TITLE OF MASTER’S DEGREE</td>
<td></td>
</tr>
<tr>
<td>LEVEL OF STUDIES</td>
<td>GRADUATE</td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>CEID_NE592</td>
</tr>
<tr>
<td>SEMESTER</td>
<td>Autumn (upon selective)</td>
</tr>
</tbody>
</table>

**COURSE TITLE:** Fundamentals of cellular networks

<table>
<thead>
<tr>
<th>INDEPENDENT TEACHING ACTIVITIES</th>
<th>WEEKLY TEACHING HOURS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LECTURES, TUTORIALS, EXERCISE</td>
<td>2 (L), 2 (T), 1 (E)</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>6</strong></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
- Skills development

**PREREQUISITE COURSES:**
- Networks - Wireless Communications

**LANGUAGE OF INSTRUCTION and EXAMINATIONS:**
- Greek

**IS THE COURSE OFFERED TO ERASMUS STUDENTS:**
- YES

**COURSE WEBSITE (URL):**
(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

Upon successful completion of the course, a student will be able to:

- have the appropriate knowledge and background on fundamentals of cellular networks 5G
- to understand the ecosystem of the cellular networks
- analyze the architecture, core and radio access networks,
- to be get know-how with basic knowledge of the resources allocation of the cellular networks.

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 | Project planning and management |
| Adapting to new situations | Respect for difference and multiculturalism |
| Decision-making | Respect for the natural environment |
| Working independently | Showing social, professional and ethical responsibility and sensitivity to gender issues |
| Team work | Criticism and self-criticism |
| Working in an international environment | Production of free, creative and inductive thinking |
| Working in an interdisciplinary environment | ...... |
| Production of new research ideas | Others... |
| Working independently | ...... |
| Team work | ...... |
| Working in an international environment | ...... |
| Working in an interdisciplinary environment | ...... |
| Production of cutting-edge research ideas | ...... |
| Production of free, creative and inductive thinking | ...... |
(3) SYLLABUS

- Introduction, basic concepts
- Design of cellular networks
- Basic architecture of cellular systems
- 2nd and 3rd generation cellular networks
- 4th generation cellular networks-1
- 4th generation cellular networks-2
- 4th generation cellular networks-3
- Wireless resources allocation
- Multiple access
- Mobility management
- Location management
- Local Area Networks-1
- Local Area Networks-2

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY
Face-to-face, Distance learning, etc.

USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students

Wide use of ICT and more specifically:
- The course is backed up by a homepage, providing all course materials. This web page is duly updated.
- Course announcements are provided electronically and are available via: online news platform, and e-mail.
- The communication with the students is performed electronically: via e-mail. An online course forum is also supported, for questions/answers, comments etc.

TEACHING METHODS
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

<table>
<thead>
<tr>
<th>Activity</th>
<th>Semester workload</th>
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<tbody>
<tr>
<td>Lectures and Tutorials</td>
<td>26 hours</td>
</tr>
<tr>
<td>Coaching</td>
<td>13 hours</td>
</tr>
<tr>
<td>Study</td>
<td>26 hours</td>
</tr>
<tr>
<td>Lab exercises or projects</td>
<td>60 hours</td>
</tr>
<tr>
<td>Exams</td>
<td>3 hours</td>
</tr>
</tbody>
</table>

Course Total 150 hours

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.

The students' assessment is supported in Greek, through a summative works during the course and final written examination, multiple questionnaires choice style, twice in each academic year.
The examination is organized by development questions, short answer questions, exercises and problems solving. Within ten days of the examination, scores and indicative answers to the exam questions are announced, and posted electronically.
It is defined a day and an hour at which students can see their exams' papers about any questions and doubts they may have, as well as to express their disagreement in rating, if they so wish. Then the rating is validated and finalized.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
  - C.Bouras and al. “Lecture Notes on 5G”, 2020

- Related academic journals:
  - IEEE Transactions on Wireless Communications,
  - IEEE Transactions on Vehicular Technology,
  - IEEE Transactions on Networking,
  - IEEE Transactions on Network and Service Management
  - IEEE Communications Magazine
  - IEEE Wireless Communications Magazine
  - IEEE Networks Magazine.