**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | SCHOOL OF ENGINEERING | | | | |
| **ACADEMIC UNIT** | DEPARTMENT OF CIVIL ENGINEERING | | | | |
|  | UNIVERSITY OF PATRAS | | | | |
| **POSTGRADUATE PROGRAM: TITLE** | Master’s Degree "Design of Resilient, Sustainable and Intelligent Infrastructures".  Tracks:  (A) Resilient Materials, Structures and Geotechnical Infrastructures,  (B) Hydraulic and Environmental Engineering for Sustainable Infrastructures, and  (C) Intelligent Systems in Transportation and Construction Project Management | | | | |
| **LEVEL OF STUDIES** | GRADUATE PROGRAM | | | | |
| **COURSE CODE** | **GPOL\_C\_16014** | **SEMESTER** | | SPRING (B’) | |
| **COURSE TITLE** | Special Topics in Intelligent Transport and Project Management Systems | | | | |
| **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* | | | **WEEKLY TEACHING HOURS** | | **CREDITS** |
|  | | | 3 | | 7.5 |
|  | | |  | |  |
| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).* | | |  | |  |
| **COURSE TYPE**  *general background,  special background, specialised general knowledge, skills development* | Special background | | | | |
| **PREREQUISITE COURSES:** | Smart cities, infrastructure and transportation or Connected Intelligent Transport Systems | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | It can be offered | | | | |
| **COURSE WEBSITE (URL)** |  | | | | |

1. **LEARNING OUTCOMES**

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| **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* | |
| *Knowledge in Intelligent Transportation Systems (ITS)*  *Knowledge in Connected Intelligent Transportation Systems (C-ITS)*  *Skills in analysis and design of ITS and C-ITS data and solutions*  *Competence in drawing conclusions from the design of ITS and C-ITS solutions* | |
| **General Competences** | |
| *Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?* | |
| *Search for, analysis and synthesis of data and information, with the use of the necessary technology*  *Adapting to new situations*  *Decision-making*  *Working independently*  *Team work*  *Working in an international environment*  *Working in an interdisciplinary environment*  *Production of new research ideas* | *Project planning and management*  *Respect for difference and multiculturalism*  *Respect for the natural environment*  *Showing social, professional and ethical responsibility and sensitivity to gender issues*  *Criticism and self-criticism*  *Production of free, creative and inductive thinking*  *……*  *Others…*  *…….* |
| *Search for information, analysis and synthesis of data with the use of the necessary technology*  *Adapting to new situations*  *Decision-making*  *Working independently*  *Teamwork*  *Working in an international environment*  *Working in an interdisciplinary environment*  *Creation of new research ideas*  *Respect for the natural environment*  *Generation of free, creative and inductive thinking* | |

1. **SYLLABUS**

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| * Advanced Connected-Intelligent Transport Systems (C-ITS) machine and computational vision algorithms. * Dynamic carpooling. * Nonlinear traffic dynamics algorithms for near-incident estimation under cluster development in C-ITS. * Smart City connected systems analysis and design. * Risk assessment in smart city connected systems. * Smart campus. |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY** *Face-to-face, Distance learning, etc.* | *Face-to-face, Distance learning* |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | *Use of ICT in teaching*  *Use of ICT in laboratory education*  *Use of ICT in communication with students* |
| **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* | |  |  | | --- | --- | | ***Activity*** | ***Semester workload*** | | Lectures | 19 | | Seminars | 6 | | Laboratory design | 23 | | Study & analysis of bibliography | 19 | | Interactive teaching | 20 | | Project | 71.5 | | Report presenting | 6 | | Report writing | 23 | | *Course total* | ***187.5*** | |
| **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.* | Language of evaluation: Greek & English  Methods of evaluation: Research comparative analysis, written work, oral examination, public presentation, laboratory work, final written report  Specific criteria are accessible to students |

1. **SUGGESTED BIBLIOGRAPHY**

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| https://www.arc-it.net (2020). Architecture Reference for Cooperative and Intelligent Transportation, ARC-IT 9.0, The National ITS Reference Architecture, U.S. Dept. of Transportation. https://www.car-2-car.org/about-c-its/ (2020). C-ITS: Cooperative Intelligent Transport Systems and Services.<https://www.its.dot.gov/pilots/cv_pilot_worldwide.htm> (2020). Connected Vehicle Pilot Deployment Program, Intelligent Transportation Systems Joint Program Office, and Office of the Assistant Secretary for Research and Technology, U.S. Dept. of Transportation.<https://www.c-roads.eu/news/News/entry/show/c-its-in-europe-is-reality-today.html> (2020). C-ROADS: C-ITS in Europe. <https://frame-online.eu> (2020). FRAME–The Framework Architecture Made for Europe. AustriaTech, Vienna, Austria.  Stephanedes, Y.J. (2005). Intelligent Transportation Systems. Chapter 86, The Engineering Handbook, 2nd Edition, Ed. R. C. Dorf, CRC Press, Boca Raton, Florida, ISBN 0-8493-1586-7,  USDOT (2020). Strategic Plan 2020-2025. John A. Volpe National Transportation Systems Center, Intelligent Transportation Systems Joint Program Office, and Office of the Assistant Secretary for Research and Technology, U.S. Dept. of Transportation, FHWA-JPO-18-746. |