

COURSE OUTLINE

1. GENERAL

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|---|---|---------------------|-----------------------|
| SCHOOL | School of Engineering | | |
| DEPARTMENT | Department of Civil Engineering/ Master Program 'Hydrometeorological Disasters Program | | |
| LEVEL OF STUDIES | 7 | | |
| COURSE CODE | ΜΠΚΔΚΠ | SEMESTER | 1st |
| COURSE TITLE | Modeling, Forecasting and Management of Flood Risk | | |
| TEACHING ACTIVITIES | TEACHING HOURS PER WEEK | ECTS CREDITS | |
| <i>If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.</i> | | | |
| | Lectures | 3 | 6 |
| | | | |
| <i>Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.</i> | | | |
| COURSE TYPE <i>Background, General Knowledge, Scientific Area, Skill Development</i> | Scientific Area | | |
| PREREQUISITES: | NO | | |
| TEACHING & EXAMINATION LANGUAGE: | Greek/ English | | |
| COURSE OFFERED TO ERASMUS STUDENTS: | NO | | |
| COURSE URL: | https://eclass.duth.gr/courses/1021376/ | | |

2. LEARNING OUTCOMES

Learning Outcomes

Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Once the course is completed, participants will be able to:

- Understand the main problems of flood management as well as the procedures governing the creation and spread of floods.
- Address the dynamics of flood risk in a changing climate
- Evaluate the extent of the risk of a flood and the vulnerability of the area and assess the responsiveness
- Develop comprehensive flood risk management strategies in a changing climate
- Assess and select the appropriate flood river model for the immediate implementation of structural and non-structural flood response measures.
- Simulate floods and predict the likely locations of floods
- Implement structural and non-structural measures to reduce the risk of flooding
- Develop preparedness and response plans for the effective reduction of flood risk
- Integrate flood recovery programs into flood risk management strategies
- Address urgent flood risk management issues.
- manage current real-time flood forecasting and warning practices.
- Propose and plan appropriate flood defenses on a case-by-case basis
- Propose natural solutions to limit the effects of floods (Natural Base Solutions)

General Skills

Name the desirable general skills upon successful completion of the module

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| Search, analysis and synthesis of data and information, ICT Use Adaptation to new situations Decision making Autonomous work Teamwork Working in an international environment Working in an interdisciplinary environment Production of new research ideas | Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning |
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- Search, analysis and synthesis of data and information
- Production of new research ideas
- Project design and management
- Respect for the natural environment
- Promoting free, creative and inductive reasoning

3. COURSE CONTENT

1. Analysis of vulnerability, risk and risk conditions.
2. Introduction to modeling, model categories, optimization.
3. Introduction to floods, their categories and mechanisms.
4. Analysis of water-based flood processes (estimation of rain losses and the rain-runoff mechanism).
5. Flood water transit.
6. Hydraulic flood simulation with open-source software.
7. Directive 2007/60.
8. Analysis and evaluation of technical flood protection projects.
9. Analysis of natural flood management solutions.

4. LEARNING & TEACHING METHODS - EVALUATION

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|---|---|--------------------------|
| TEACHING METHOD <i>Face to face, Distance learning, etc.</i> | Distance learning | |
| USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) <i>Use of ICT in Teaching, in Laboratory Education, in Communication with students</i> | Use of ICT in Teaching, and Communication with students <ul style="list-style-type: none"> • Digital slides • videos • MsTeams/ e-class, webmail | |
| TEACHING ORGANIZATION <i>The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.</i> <i>The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.</i> | Activity | Workload/semester |
| | Lectures | 39 |
| | Final project | 60 |
| | Bibliographic research & analysis | 78 |
| | Final examination | 3 |
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| | TOTAL | 180 |
| STUDENT EVALUATION <i>Description of the evaluation process</i> <i>Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report,</i> | Written Assignment, 100% | |

Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

5. SUGGESTED BIBLIOGRAPHY

1. Τσακίρης Γ. (Υπεύθυνος Έκδοσης), (1995). «ΥΔΑΤΙΚΟΙ ΠΟΡΟΙ: Ι. Τεχνική Υδρολογία», Εκδόσεις Συμμετρία, Αθήνα, ISBN 960-266-003-1.
2. Σακκάς Ι.Γ. (2004). «ΤΕΧΝΙΚΗ ΥΔΡΟΛΟΓΙΑ, Τόμος 1, Υδρολογία Επιφανειακών Υδάτων», Εκδόσεις Αϊβάζη, Θεσσαλονίκη.
3. Spiliotis M., Iglesias A. and Garrote L., 2020. A multicriteria fuzzy pattern recognition approach for assessing the vulnerability to drought: Mediterranean region. *Evolving Systems* (in print, <https://doi.org/10.1007/s12530-020-09332-7>)

ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

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| Teacher (full name): | Angelides P., Maris F., Spiliotis M., Papaioannou G. |
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| Supervisors: (1) | YES |
| Evaluation methods: (2) | Written Assignment (100%) |
| Implementation Instructions: (3) | Written assignment should be submitted via eclass on a specified date. |