# COURSE OUTLINE

## 1. GENERAL

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| **SCHOOL** | FACULTY OF ENGINEERING | | |
| **DEPARTMENT** | ENVIRONMENTAL ENGINEERING | | |
| **LEVEL OF STUDIES** | UNDERGRADUATE | | |
| **COURSE CODE** | **OEB2** | **SEMESTER** | **7th** |
| **COURSE TITLE** | INDOOR AIR QUALITY | | |

| **TEACHING ACTIVITIES** *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.* | **TEACHING HOURS PER WEEK** | **ECTS CREDITS** |
|---|---|---|
| | 3 | 5 |
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| *Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.* | | |

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| **COURSE TYPE** *Background, General Knowledge, Scientific Area, Skill Development* | SCIENTIFIC AREA |
| **PREREQUISITES:** | Atmospheric Chemistry, Atmospheric Physics, Applied Statistics, Fluid Mechanics, Thermodynamics. |
| **TEACHING & EXAMINATION LANGUAGE:** | Greek |
| **COURSE OFFERED TO ERASMUS STUDENTS:** | NO |
| **COURSE URL:** | https://eclass.duth.gr/courses/TMC103/ |

## 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.*

1. Knowledge based

- *Understand the fundamentals of indoor environmental control.*
- *Understand the many factors affecting indoor air quality.*
- *Understand the nature of indoor atmospheric pollutants, their sources, their sinks and their pathways, their indoor chemistry, as well as their effects on human health and sensitive materials.*
- *Understand the relationship between the building's design, use and operation and indoor air quality/environment.*
- *Understand indoor atmospheric physics and chemistry.*
- *Understand basic concepts, protocols and applications of building diagnostics.*
- *Understand and use IAQ models as useful tools for controlling indoor air quality*

2. Skills / Competences acquired

- *Students will be able to conduct a survey of the parameters that affect indoor air quality and/or thermal comfort and identify the potential hazards and stresses for human health and/or sensitive materials.*
- *Students will be able to use the suitable instrumentation for indoor air pollution and micro-climatic conditions measurements.*
- *Students will be able to apply IAQ models.*

- *Students will be able to propose preventive or cost-effective mitigation strategies to sustain or improve IAQ.*

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

Search, analysis and synthesis of data and information,
ICT Use
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Project design and management

## 3. COURSE CONTENT

The course provides the fundamentals on Indoor Air Quality (IAQ).
It is designed to provide a framework for understanding how indoor and outdoor sources of pollution, heat and humidity, materials of construction, lighting levels, noise, ventilation and air conditioning systems affect the indoor air quality in buildings. Also, which are the effects of poor indoor air quality on humans and on sensitive materials and methods on the management of indoor air.

The course has 7 components: introduction and overview indoor air quality (IAQ) issues; indoor pollutants and their potential sources; building factors affecting indoor air quality; effects of poor indoor air quality in human health and on materials; dynamics of indoor atmospheric pollutants; indoor air quality simulations; indoor air management (assessment of indoor air quality and simple preventive measures plus more advanced technological approaches of controlling indoor environment).
The student training is divided in a theoretical and in a computer-based modelling approach.

## 4. LEARNING & TEACHING METHODS - EVALUATION

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| **TEACHING METHOD**<br>*Face to face, Distance learning, etc.* | Face to face |
| **USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)**<br>*Use of ICT in Teaching, in Laboratory Education, in Communication with students* | **Use of ICT during teaching and communication with students** |

**TEACHING ORGANIZATION**

*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.*

| *Activity* | *Workload/semester* |
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| Lectures | 20 |
| Lab Exercises | 20 |
| Projects | 55 |

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| *The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.* | Reading and studying | 55 |
| | Class total | 150 |
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| **STUDENT EVALUATION**<br>*Description of the evaluation process*<br><br>*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, Clinical examination of a patient, Artistic interpretation, Other/Others*<br><br>*Please indicate all relevant information about the course assessment and how students are informed* | The course is evaluated by written examination (60%) and project presentation (40%). | |

**5. SUGGESTED BIBLIOGRAPHY**

1. E-book «Indoor Air Quality» G. Loupa, available in the e-class.
2. «Indoor Air Quality», M. Lazaridis, TZIOLAS Press, 2008
3. Papers

# ANNEX OF THE COURSE OUTLINE

## Alternative ways of examining a course in emergency situations

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| **Teacher (full name):** | Glykeria Loupa |
| **Contact details:** | gloupa@env.duth.gr |
| **Supervisors:** | YES |
| **Evaluation methods:** | Written examination with distance learning methods |
| **Implementation Instructions:** | The examination in the course will take place on the day defined by the Program of the Department. The topics will be posted in the e-class. In the Word file of the topics that each student will "download", he will write his answers.<br>Each of them will post this file in the "Assignments" section of the e-class.<br>This approach is exactly the same as the way students' homework is done.<br>The test will be performed via Teams. The link will be sent΄ to students via e-class exclusively΄ to the institutional accounts of those who have registered for the course and have accepted the terms of the distance examination.<br>Students must log in to the examination room through their institutional account. Otherwise, they will not be able to participate. They will also take part in the examination with a camera which they will have open during the examination. Before the start of the exam, students will show their academic ID to the camera, so that they can be identified. Any question will be asked through a microphone. |

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| | They should also make sure that the issues are processed on a desktop or laptop and not on a tablet or mobile. |