a) General			
School	ENGINEERING		
Academic unit	MECHANICAL ENGINEERING		
Level of studies	Undergraduate		
Course code	MM109Y03	*Semester*	9
Course title	**Air pollution**		

Independent teaching activities	Weekly teaching hours	ECTS
Lectures	3	7
Laboratory exercises	2	

Course type	Deepening/consolidation
Course category	Compulsory for Direction 1
Prerequisite courses	-
Language of instruction and examinations	Greek
Is the course offered to Erasmus students	Yes
Course website (url)	https://eclass.uniwa.gr/courses/MECH124/ & https://moodle.uniwa.gr/course/index.php?categoryid=52

b) Learning outcomes and general competences

b1. Learning outcomes

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

- They have acquired the knowledge and the understanding of issues related to air pollution and the quality of the atmospheric environment in general. Be able to describe relevant concepts and to identify the causes-sources that cause problem in the quality of the atmospheric environment.
- Be able to perceive, interpret and clearly explain issues related to air pollution, to generalize the problem, to correctly appreciate in order to make right conclusions.
- Be able to use all the concepts related to air pollution, to provide new calculations, to be able to correctly classify the causes of the various problems and generate new knowledge, while gaining implementation experience.
- To have the ability to analyze the problems of air pollution and degradation of the atmospheric environment in probably components so that they can combine, design, develop and implement both old and innovative technologies in order to tackle these problems.
- Be able to revise old views related to air pollution and its treatment, so they can create new knowledge. Also, be able to compose and organize working groups and propose solutions.
- Have a proven critical ability so they can compare and evaluate different statements on the quality of the atmospheric environment (for example, high concentrations of particulate matter from anthropogenic activities and dust transport from the Sahara-Sahara Dust event).
- Be able to participate in measuring-experimental procedures. Be able to know to handle suitable measuring devices and also to be able to evaluate the measurements results in order to judge situations correctly, proposing in each case the appropriate solution.
- Be able to work with their fellow students, to create and present both at individual and group level a case study from its initial stages up to the final evaluation and finally to be able to propose new ideas and solutions.

b2. General competences

- Search, analysis and synthesis of data and information using and applying the required

technologies
- Decision Making
- Respect for the natural environment
- Working independently
- Individual project
- Teamwork
- Criticism and self-criticism
- Production of free, creative and inductive thinking

c) Syllabus

History and classification of air pollution, atmospheric pollution scales, major air pollutants study, composition and structure of the atmosphere, atmospheric boundary layer, correlation between atmospheric pollution and meteorology, pollutants emission and sources, Gaussian model for diffusion and dispersion of air pollution from a point source, industry and air pollution, buildings, central heating, transportation and air pollutants, anti-pollution technologies, emission control technologies, air pollutants measuring-recording technologies, processing, analysis and presentation of atmospheric pollution data, indoor air quality, human thermal comfort-discomfort & microclimate coexistence with atmospheric air pollution and its impact on public health, adverse health effects due to air pollution exposure, public health.

d) Teaching and learning methods - Evaluation

Delivery	Lectures and exercises, face-to-face.
Use of information and communications technology	- Audiovisual material and multimedia applications - MS Teams/Moodle/e-class - Open courses

Teaching methods	Activity	Semester workload
	Lectures	39
	Tutorials	0
	Laboratory exercises	26
	Computational exercises	0
	Individual work	91
	Course total	156

Student performance evaluation	Language of evaluation: Greek for Greek students and English for ERASMUS students. Intermediate assessment and written final examination. Concerning the Laboratory of the course, individual and/or group assignments and written or oral examination or presentation, per exercise and per study case.

e) Suggested bibliography

1. Lazaridis M. (2010). Atmospheric pollution with meteorological elements. Tziolas publications, ISBN 978-960-418-246-6, Thessaloniki, Greece (in Greek)
2. Triantafillou A.G. (2010). Air Pollution. Thalis Publications. Kozani, Greece(In Greek)
3. Gentekakis J. (2010). Air Pollution: Impacts, control and alternative technologies Klidarithmos publications, ISBN: 978-960-461-394-6, Athens, Greece (in Greek)
4. Burden F.R., Foerstner U. and McKelvie I.D. (2002). Environmental Monitoring Handbook. ISBN: 9780071351768, The McGraw-Hill Companies, Inc
5. Lodge J.P. (1998). Methods of air sampling and analysis. 3rd Edition, ISBN 0-87371-141-6, Lewis Publisher, New York, USA

6. Boubel R.W., Fox D.L., Turner B.D. and Stern A.C. (1994). Fundamentals of air pollution. 3rd Edition, ISBN 0-12-118930-9, Academic Press, Elsevier, USA

7. Wight G.D., 1994. Fundamentals of air sampling. ISBN 0-87371-826-7, Lewis Publisher New York, USA