

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCIENCES		
ACADEMIC UNIT	PHYSICS		
LEVEL OF STUDIES	POSTGRADUATE		
COURSE CODE	M224	SEMESTER	2
COURSE TITLE	REMOTE SENSING		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>	WEEKLY TEACHING HOURS	CREDITS	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Special background - Specialised general knowledge		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning outcomes <i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>The course provides the student advanced knowledge for the understanding of remote sensing methods as well as remote sensing applications in meteorology.</p> <p>After the successful completion of the course, the student will:</p> <ul style="list-style-type: none"> • be familiar with the basic concepts of remote sensing • know the role of electromagnetic energy in remote sensing applications • know about Meteorological Satellites orbits and the meteorological satellite programs MSG and EPS • understand the digital processing of satellite data and the techniques used for information extraction • can recognize clouds and cloud systems with the use of satellite images • know how weather Radars operate • know what are the applications of remote sensing in meteorology and in the other

earth sciences

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?

- | | |
|---|---|
| <i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> | <i>Project planning and management</i> |
| <i>Adapting to new situations</i> | <i>Respect for difference and multiculturalism</i> |
| <i>Decision-making</i> | <i>Respect for the natural environment</i> |
| <i>Working independently</i> | <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> |
| <i>Team work</i> | <i>Criticism and self-criticism</i> |
| <i>Working in an international environment</i> | <i>Production of free, creative and inductive thinking</i> |
| <i>Working in an interdisciplinary environment</i> | <i>.....</i> |
| <i>Production of new research ideas</i> | <i>Others...</i> |
| | <i>.....</i> |

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Team work
- Production of free, creative and inductive thinking
- Working in an interdisciplinary environment
- Respect for the natural environment

(3) SYLLABUS

- Remote Sensing (Basic concepts, satellite imagery, radar, remote sensing sensors)
- Electromagnetic Energy (Electromagnetic Radiation, Electromagnetic Spectrum, Laws, surface characteristics)
- Meteorological Satellites (Orbits, polar orbits, sun synchronous orbits, geostationary orbits, AVHRR radiometer, EPS Program, MSG Program)
- Digital Processing of Satellite Data (Digital Processing, image corrections, image processing, information extraction techniques)
- Cloud recognition - cloud systems (cloud systems, cloud identification, synoptic weather systems recognition, use of satellite images in synoptic scale)
- Meteorological Radars (radar signal, pulse, the role of radar wavelength on target recognition, Scanning Methods)
- Remote Sensing Applications (meteorological, others)

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Students are referred to websites of organisations for the exploitation of meteorological satellites such as NOAA and EUMETSAT, as well as to other relevant educational websites.	
TEACHING METHODS <i>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,</i>	Activity	
	Semester workload	
	Lectures	120
	Homework	27
	Exams	3

<i>etc.</i> <i>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</i>		
	Course total	150
<p align="center">STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Written exams at the end of the course. Five theory and / or exercises issues. The five themes are equivalent.</p>	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- **Images in Weather Forecasting: A Practical Guide for Interpreting Satellite and Radar Imagery Paperback – July 28, 1997**

by M. J. Bader (Editor), G. S. Forbes (Editor), J. R. Grant (Editor), R. B. E. Lilley (Editor), A. J. Waters (Editor)

Publisher: Cambridge University Press (July 28, 1997)

ISBN-10: 0521629152

ISBN-13: 978-0521629157

- **Introduction to Remote Sensing**

by Arthur P. Cracknell (Author)

Publisher: CRC Press; 2 edition (April 2, 2007)

- Suggested web pages:

- <http://www.eumetsat.int/website/home/Data/Training/index.html>
- <http://www.fdtb.noaa.gov/pages/satellite.html>