

## COURSE OUTLINE Drought and Agro-Forest Fires

EDUCATION LEVEL	7		
CODE	WBCC-513ws	SEMESTER	2 <sup>nd</sup>
TITLE	Drought and Agro-forest fires		
TEACHING ACTIVITIES	HOURS/WEEK	ECTS	
Lectures, Practice exercises, Field work	3	6	
TYPE OF COURSE	Main course in the specialization «Water scarcity»		
PREREQUISITE KNOWLEDGE	-		
LANGUAGE OF INSTRUCTION AND ASSESSMENT	Greek		
AVAILABILITY TO ERASMUS STUDENTS	-		
WEBSITE (URL)	<a href="https://eclass.uoa.gr/courses/GEOL576/">https://eclass.uoa.gr/courses/GEOL576/</a>		

### LEARNING OUTCOMES

Learning Outcomes/Subject Specific Competences
<p>Fire is an important ecological factor with a presence on the planet starting from the moment of the existence of any form of terrestrial vegetation, affecting both the structure and distribution of many plant communities across the globe. For millions of years it has been a periodic process in the succession cycle of vegetation, causing its continuous regeneration and promoting the productivity of many plant communities and ecosystems. Later, fire became an important human tool, widely used to improve living conditions. The fire characteristic most altered by human presence is fire frequency, mainly due to the increase in ignition sources. At the same time, the climate change that leads to increasingly dry conditions in already dry and semi-arid areas favors the occurrence and development of fire even more. The increased frequency and extent of wildfires is a major global issue due to their high contribution to air pollution and their consequent impact on ecosystem properties and human health. Projections of forest fire activity around the world under projected global changes in climate patterns, anthropogenic activities and land uses suggest a significant increase in fire frequency by 2050, affecting many regions of the world. In order for a problem to be addressed or managed it is first necessary to understand it. Upon successful completion of the course, students will know:</p> <ul style="list-style-type: none"> <li>The historical ecological role of fire in shaping today's global landscape</li> <li>The phenomenon of fire, the parameters that determine its behavior and the elements that determine the fire regime of an area</li> <li>The properties of the fuel that determine the behavior and severity of the forest fire.</li> <li>The role of climate and climate change in the current and future behavior of agro-forest fires.</li> <li>The ecological effects of fire on soil and vegetation and plant survival mechanisms</li> <li>The great importance of preparing homes to protect them from fires</li> <li>Modern fire behavior prediction tools and how to use them</li> <li>Modern fire risk assessment methods</li> </ul>

Generic Competences
<ul style="list-style-type: none"> <li>Application of knowledge in practice</li> <li>Autonomous work</li> <li>Teamwork</li> <li>Work in an international environment</li> <li>Work in an interdisciplinary environment</li> <li>Respect for the natural environment</li> <li>Promotion of free, creative and inductive thinking</li> </ul>

### COURSE CONTENT

<p>The purpose of the course is for the students to acquire a global and comprehensive knowledge of the phenomenon of rural-forest fires, its dynamics and its management. For this reason, the content of the course covers both the subject of pyroecology and that of pyrology and is structured as follows:</p> <ul style="list-style-type: none"> <li>Historical evolution of the phenomenon of fires</li> <li>The combustion process and the physical and chemical properties of fuel that affect it</li> <li>Forest fire behavior and regime</li> <li>Effects of fires on the chemical, physical and biological properties of the soil.</li> <li>Immediate, short-term and long-term effects of fires on vegetation</li> <li>Plant survival strategies from fires</li> <li>Status of forest fires in Greece, the Mediterranean and the world and their dynamics under conditions of climate change and socio-economic changes</li> </ul>
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Forest fire behavior prediction models and modern risk assessment approaches  
 Protection of citizens from forest fires & the great importance of preparing homes  
 Management of forest fires including the social dimension of the problem  
 Behavior of past deadly fires and lessons learnt

LEARNING ACTIVITIES - TEACHING and ASSESSMENTS METHODS

MODE OF DELIVERY	Distance learning	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Use of ICT in Teaching Use of ICT in Laboratory Education Use of ICT in communication with students Use of ICT in Student Assessment	
PLANNED LEARNING ACTIVITIES	Activity	Semester Workload
	Lectures	39 h
	Practice Exercises	30 h
	Individual Project	40 h
	Individual study	41 h
	Total	150 h
ASSESSMENT METHODS AND CRITERIA	Multiple choice questions Questions requiring short answers	

TEXTBOOKS - BIBLIOGRAPHY

Καλαμποκίδης, Κ., Ηλιόπουλος, Ν., Γλιγλίνος, Δ. (2013). Πυρο-Μετεωρολογία και Συμπεριφορά Δασικών Πυρκαγιών σε ένα Μεταβαλλόμενο Κλίμα. Εκδόσεις ΙΩΝ ISBN 978 960 508 045 7  
 Finney, M. A., McAllister, S.S., Grumstrum, T.P., Forhofer, J.M. (2021). Wildland Fire Behaviour: Dynamics, Principles and Processes. CSIRO publishing  
 Keeley, J. E., Bond, W. J., Bradstock, R. A., Pausas, J. G., Rundel, P. W. (2012). Fire in Mediterranean ecosystems : ecology, evolution and management. Cambridge University Press.  
 Συναφή επιστημονικά περιοδικά:  
 International Journal of Wildland Fire – CSIRO Publishing  
 Fire - MDPI  
 Fire Ecology - Springer  
 Forest Ecology and Management - Elsevier