

## 2<sup>nd</sup> Semester

### Organic Chemistry

1. GENERAL			
SCHOOL	Faculty of Sciences in collaboration with Faculty of Engineering, Aristotle University of Thessaloniki		
DEPARTMENT	Materials Science and Engineering		
LEVEL OF STUDIES	ISCED level 7 (5-year Integrated Master's programme) ISCED level 6 (4-year BSc programme)		
COURSE CODE	<b>MSEN 201</b>	SEMESTER	2 <sup>nd</sup> Semester
COURSE TITLE	<b>Organic Chemistry</b>		
TEACHING ACTIVITIES	Lectures, tutorials/problem sessions, laboratory/computer exercises (where applicable), case studies and guided self-study.	TEACHING HOURS PER WEEK	ECTS CREDITS
		4	6
COURSE TYPE	Background and Scientific Area		
PREREQUISITES	No prerequisites		
TEACHING AND EXAMINATION METHODS	English		
COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE URL	<a href="https://elearning.auth.gr/course/view.php?id=xxxxx">https://elearning.auth.gr/course/view.php?id=xxxxx</a>		

2. LEARNING OUTCOMES	
Learning Outcomes	<p>By the end of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>understand the concept of organic molecules and materials.</li> <li>recognize the repeating chemical structural unit of several basic organic materials.</li> <li>understand the mechanisms of fundamental organic transformations/reactions.</li> <li>develop fundamental organic reactions coordination.</li> <li>realize the chemical properties and reactions of basic organic moieties.</li> <li>Understand and recognize the main mechanistic pathways for organic reactions.</li> <li>Acids, amines and their derivatives as precursors of organic materials synthesis.</li> </ul>
General Skills	<ul style="list-style-type: none"> <li>Searching, analyzing and synthesizing data and information</li> <li>Decision-making</li> <li>Independent work</li> <li>Teamwork</li> </ul>

	<ul style="list-style-type: none"> <li>• Generate new research ideas</li> <li>• Project planning and management emphasizing materials science</li> <li>• Promoting free, creative and inductive thinking</li> <li>• Modeling and solving real-world problems</li> <li>• Working in a multidisciplinary environment</li> </ul>
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### 3. COURSE CONTENT

<ol style="list-style-type: none"> <li>1. Structure and Bonding</li> <li>2. An Overview of Organic Reactions</li> <li>3. Stereochemistry at Tetrahedral Centers</li> <li>4. Hydrocarbons: Alkanes, Cycloalkanes and their Stereochemistry</li> <li>5. Hydrocarbons: Alkenes and Alkynes, Reactivity, Reactions, Stereochemistry and Synthesis</li> <li>6. Organohalides, Reactions of Alkyl Halides: Nucleophilic Substitutions and Eliminations</li> <li>7. Structure Determination: Spectroscopic and Chromatographic analysis</li> <li>8. Conjugated Compounds and Ultraviolet Spectroscopy</li> <li>9. Benzene and Aromaticity, Polyaromatic compounds: Electrophilic Aromatic Substitution</li> <li>10. Characteristic Polar Groups in Organic Materials</li> <li>11. Carbonyl compounds: Condensation Reactions-Anionic Polymerization</li> <li>12. Carboxylic Acids, Amines and their Derivatives</li> </ol>
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### 4. LEARNING & TEACHING METHODS - EVALUATION

<b>Teaching method</b>	Face-to-face.												
<b>Use of ICT</b>	<p>Use of ICT in Course Teaching, Use of ICT in Communication with Students</p> <p>Description: Use of Information and Communication Technologies (ICT) in teaching the course with tools of modern distance learning (ZOOM) and asynchronous education (eclass).</p> <p>Use of learning aids based on ICT: Excel, Word, Power Point</p> <p>Use of ICT in student assessment: Electronic grading (eclass, universis).</p> <p>Use of ICT in communication with students: eclass, email, ZOOM.</p>												
<b>Teaching organization</b>	<p>The supervised and unsupervised workload per activity is indicated below (total workload complies with ECTS standards).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Activity</th> <th style="text-align: center;">Workload/semester (hours)</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">52</td> </tr> <tr> <td>Bibliographic written, research and problem solving</td> <td style="text-align: center;">83</td> </tr> <tr> <td>Tutorial</td> <td style="text-align: center;">13</td> </tr> <tr> <td>Exams</td> <td style="text-align: center;">2</td> </tr> <tr> <td><b>Total</b></td> <td style="text-align: center;"><b>150</b></td> </tr> </tbody> </table>	Activity	Workload/semester (hours)	Lectures	52	Bibliographic written, research and problem solving	83	Tutorial	13	Exams	2	<b>Total</b>	<b>150</b>
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Bibliographic written, research and problem solving	83												
Tutorial	13												
Exams	2												
<b>Total</b>	<b>150</b>												
<b>Student evaluation</b>	<p>Assessment Language: English</p> <p>Assessment Methods:</p> <ul style="list-style-type: none"> <li>• Short Answer Questions,</li> <li>• Essay Development Questions,</li> <li>• Multiple Choice Test</li> <li>• Problem Solving</li> <li>• Oral Exam</li> <li>• Written exams</li> </ul>												

## 5. SUGGESTED BIBLIOGRAPHY

### EUDOXUS

«Organic Chemistry» Ed. John McMurry, (9<sup>th</sup> Edition), ISBN 9781305080485

«Organic Chemistry» Ed. Marc Loudon and James Parise (Author, (6<sup>th</sup> Edition). ISBN-10: 1936221349, ISBN-13: 978-1936221349

### Additional bibliography for study

- Teaching material slides