

SYLLABUS

| Basic course data | |
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| Faculty: | Faculty of Engineering and Informatics |
| Course Title: | Recycling of materials |
| Level of studies: | Bachelor |
| Type: | Elective course |
| Year: | III |
| Hours per week: | 3 |
| Credits: | 4 |
| Time / location: | 13-16, Hall 006 |
| Lecturer: | Asoc. Prof. Dr. Milihate Aliu |
| Contact details: | milihate.aliu@ushaf.net |
| Course description: | |
| Course description: | <i>This course will offer students information about pollution and its environmental impact. Through this course students will gain sufficient information about materials, theory recycling potential and its usability in the design and production</i> |
| Objectives of the subject: | |
| Objectives of the subject: | <p><i>The main objectives of the course are:</i></p> <ul style="list-style-type: none"> • <i>To introduce students to the environmental problems that we face including air pollution, water pollution, land pollution, and discusses potential solutions to these problems.</i> • <i>To make the students familiar with the basic knowledge of concepts and principles of plastic wastes and their recycling.</i> • <i>To learn the recycling processes of plastics including the step-by-step recycling stages.</i> • <i>To provide students knowledge on the ecological environment.</i> |
| Expected learning outcomes: | |
| Expected learning outcomes: | <p><i>After successful completion of this course, student will be able to:</i></p> <ul style="list-style-type: none"> • <i>Understand the flow of matter with the flow of energy among organisms and between organisms and their environment in an ecosystem</i> • <i>Differentiate inorganic and organic pollutants</i> • <i>know the most common technical methods for recycling of polymeric materials (plastics and composites).</i> • <i>understand the environmental risks that the use of polymeric products may present.</i> |
| Contribution to student workload which should correspond to student learning | |

| outcomes | | | |
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| Activity | Hours | Day/week | Overall |
| Teaching (lecturer with lab exercises) | 3 | 15 | 45 |
| Practical work | 1 | 5 | 5 |
| Consultations with the teacher | 1 | 4 | 4 |
| On site training | | | 5 |
| Kollokfiume, seminars | 2 | 5 | 10 |
| Homework | - | - | - |
| Student self study time (in library or at home) | 2 | 10 | 20 |
| Preparing for the final exam | 2 | 5 | 10 |
| Time spent in assessment (tests, quizzes, final exam) | 1 | 2 | 2 |
| Projects, presentations, etc. | 1 | 1 | 1 |
| Total | | | 102 |
| Teaching Methodology: | | | |
| | <i>Lectures and exercises combined with case studies and classroom discussions, seminar work, engineering experience in companies dealing with the field.</i> | | |
| Assessment and grading: | | | |
| | Students will be assessed with using the following elements. <ul style="list-style-type: none"> • <i>Intermediate test: 15%</i> • <i>Group work and case studies: 35 %</i> • <i>Final exam: 50 %</i> | | |
| Required or recommended literature resources: | | | |
| Required literature: | | | |
| | <ol style="list-style-type: none"> 1. Prof.Asoc. Dr. Milihate Aliu, “NDOTJA E AMBIENTIT”, Dispencë, Ferizaj, 2018. 2. Mr. Sc. Ismet Malsiu, ligj. i SHL., RIPËRPUNIMI (RIKIKLIMI) I MATERIALEVE POLIMERE/ EKOLOGJIA, Ligjërata të autorizuara, Ferizaj 2013. | | |
| Recommended literature: | | | |
| | <ol style="list-style-type: none"> 3. Emmel, Thomas C., “An Introduction to ECOLOGY AND POPULATION BIOLOGY”, 1st ed. 1973. 4. Odum, E.P. FUNDAMENTALS OF ECOLOGY, 3rd ed. 1971. 5. Woodard & Curran, Inc., “INDUSTRIAL WASTE TREATMENT” Handbook (Second Edition), 2006. 6. M.sc.Marianthi GURI., REDUKTIM, RIPERDORIM, RIKIKLIM - 3R, METODA EKOLOGJIKE TË TRAJTIMIT TË MBETJEVE URBANE, Tiranë, 2008. 7. M. Bittner, W. Michaeli and G. Menges, Hanser “RECYCLING AND RECOVERY OF PLASTICS”, | | |

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| | edited by J. Brandrup, 1996. |
| Course details: | |
| Week | Lectures |
| Week 1: | <i>Module 1: Introduction to Ecology</i> |
| Week 2: | <i>Module 2: Transformations of Matter and Energy</i> - <i>Energy and matter moving through an ecosystem</i> |
| Week 3: | <i>Module 3: Sources and types of Pollutants</i> - <i>Inorganic and organic Pollutants</i> |
| Week 4: | <i>Module 4: Water and land Pollution</i> - <i>Water pollutants</i> - <i>Biodegradable and Non-biodegradable material</i> |
| Week 5: | <i>Module 5: Generators of Hazardous Waste</i> - <i>Industrial waste</i> - <i>Commercial waste</i> - <i>Glass waste</i> - <i>Plastic waste</i> - <i>Rubber waste</i> |
| Week 6: | <i>Module 6: Solid waste management</i> |
| Week 7: | <i>Module 7: Mechanisms for biological and chemical degradation of polymeric materials (decomposition)</i> |
| Week 8: | <i>Module 8: Processes, stages, and benefits of plastics recycling</i> |
| Week 9: | <i>Module 9: Mechanical recycling of polymeric materials</i> |
| Week 10: | <i>Module 10: Chemical recycling of polymeric materials</i> - <i>Pyrolysis, supercritical fluids, hydrolysis</i> |
| Week 11: | <i>Module 11: The Effect of Recycling Plastic Bottles on the Environment</i> - <i>Factors affecting recycling of plastics</i> |
| Week 12: | <i>Module 12: Applications of recycled thermoplastic polymers</i> - <i>Recycled polymers for Food Industry</i> - <i>Recycled polymers for Indoor Applications</i> |
| Week 13: | <i>Module 13: Energy Recovery or Quaternary Recycling</i> |
| Week 14: | <i>Module 14: Visit to the factory: Students will visit nearby industries and collect information about recycling process.</i> - <i>Example of plastic recycling process of recovering waste or scrap plastic and reprocessing it into useful product.</i> |
| Week 15: | <i>Module 15: Presentation of seminar topics by students</i> <i>The student(s) will be required to prepare and deliver a Seminar, on the assigned topic with the help of Power Point Presentation as well as submit a type written report.</i> |

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| | <i>The seminar shall also include a detailed question answer session.</i> |
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| Academic policies and rules of conduct: |
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Set the code of conduct according to the statute of UASF.

- First of all, the student should be mindful and respectful towards the institution and the academic rules
- They should respect the schedule of lectures, exercises, practical work and be attentive to the class.
- It is mandatory to have and show the ID on the exam and during the factory visits
- When preparing seminar papers, the student must follow the instructions given by the teacher for the research and technical execution of the paper.