ENVE 532
ENVIRONMENTAL BIOTECHNOLOGY
Graduate Course

Instructor: Assoc. Prof. Bulent ICGEN

Course page: Homepage for this course http://www.metu.edu.tr/~bicgen/courses/envbio.html
Print out lecture slides before each class and annotate these notes during lecture

Credits: 3

Semester(s): Spring 2015

Time & place: Friday 9:40-12:30 & Z01

Office hours: By appointment

Office: Z34

Phone: 5858

Email: bicgen@metu.edu.tr

Environmental biotechnology: theory and application / by GarethM. Evans, Judith C. Furlong. 2003. Johns Wiley & Sons Ltd. UK.

Requirements:

Course description:

Environmental Biotechnology utilizes microorganisms to improve environmental quality. These improvements include treatment of contaminated waters and wastewaters, clean-up of industrial waste streams, and remediation of soils contaminated with hazardous and toxic chemicals. Environmental biotechnology is essential to society and truly important as a technical discipline. The proposed course is designed to summarize recent progress in the area of biotechnology with an emphasis on novel approaches that offer new insights into the environmental biotechnology. The potential applications of biological treatment and how they can be combined for a greater benefits for solving environmental issues have been illustrated with example studies.
Course grades will be based on the following:

1. A midterm exam on the first half of the course (30%).
2. A comprehensive final exam (50%).
3. Presentation (20%)

Students will be evaluated on their preparation and presentation of reading assignments and participation in discussion. Every student will participate in both a presentation and class discussions.

Thus, there are 100 points possible. The letter grades, coefficients and percentage equivalents are given below.

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<tr>
<th>Percentage</th>
<th>Course Grade</th>
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<tr>
<td>90-100</td>
<td>AA</td>
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<td>85-89</td>
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Exams will be based upon material covered in class lectures and assigned readings.

Attendance policy:

Attendance is highly recommended. Any absences must be well justified and explained to the instructor in advance in order to make up any of the graded material.

Make-up policy:

There will be no make-up exams unless the following:

- For planned excused absences, you must contact the instructor 48 h in advance of the missed exam and provide adequate documentation.
- For absences due to catastrophic events such as serious illness, accident, or death in the immediate family, proper documented justification is required.

I will require official documentation for any missed assignments or exams!

Academic conduct:

The penalty for course-related academic dishonesty (i.e., cheating on exams, plagiarism, etc.) will be failure of the entire course along with a report of the incident being sent to Judiciaries.
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WEEK TOPICS

1. Molecular biotechnology revolution and biological systems: DNA, RNA and protein synthesis, recombinant DNA technology

2. Chemical synthesis, sequencing, amplification of DNA, manipulation of genes in prokaryotes and eukaryotes

3. Protein engineering, synthesis of commercial products by recombinant microorganisms

4. Utilization microbial insecticides, genetic engineering of plants, transgenic animals, human gene therapy

5. Biotechnology and environmental applications, bio-treatment and bioremediation methods, bioremediation and biomass

6. Midterm Exam

7. Biological processes, activated sludge or biofilm in wastewater treatment, in situ and ex situ bioremediation technologies and strategies


9. -14 Student Presentations

Final Exam
Time & Place will be announced

For assigned readings see downloads from:
http://www.metu.edu.tr/~bicgen/courses/envbio.html
Presentation Hints
Students are required to submit a printout of their presentation related to this course subjects at the presentation time. The possible topics should focus on environmental applications of biotechnology. The chosen topic of your presentation must focus on some aspect of environmental engineering and the case study must be based upon a journal article published in the primary literature since January 2010. A primary journal is one in which the articles are research based – NOT review articles. Your presentation must broadly summarize the chosen subject and a case study in the chosen article and specifically address the following points:

• What was the purpose of the research?
• What specific questions were addressed and how?
• What significant methods were used and the results were obtained?
• What was particularly striking about this study and its findings?
• What questions did this study not answer and how might these be approached?

Students are expected to give an oral presentation. The oral presentation is usually limited to a 15-minute presentation of your subject, followed by a 5-minute question & answer period. Speakers are suggested to use Microsoft PowerPoint. It is an honor to have the opportunity of being in the spotlight with an audience of peers giving you their time and attention. You have an obligation to them (and to your profession) to use that occasion wisely and well.

Recommendations in preparing your talk:
Decide on a limited number of the significant ideas you want your audience to code, comprehend, and remember.

Minimize details (of procedure, data analysis, and literature review) when highlighting the main ideas you want to transmit.

State clearly in simple, jargon-free terms what the point of the research is, what you discovered, and what you think it means--its conceptual, methodological, or practical value.

Employ some redundancy in repeating important ideas to enhance comprehension and recall.

Write out your presentation as a mini-lecture (with a listening audience in mind), starting with an outline that you expand into a narrative.

Practice delivering it aloud in order to learn it well, to make its length fit in the time allocated, and to hear how it sounds.

Do not read your paper. Speak your ideas directly to your audience, referring—if necessary only-to an outline of key points and transitions.

Try to speak loud enough, clear enough, and with sufficient enthusiasm to hold the attention of your audience despite distractions (internal and external).

State your final conclusions and end on time.