

**University of Macau**  
**Department of Computer and Information Science**  
**MECH314 – Basic Microeconomics**  
**Syllabus**  
**1st Semester 2012/2013**  
**Part A – Course Outline**

**Compulsory course in Electromechanical Engineering**

**Catalog description:**

3 credits. This course introduces the basic microeconomic theory, focusing on the behavior of individual decision-making units, such as consumers and companies. The interaction of these units in various types of markets will also be explored. As a basic introduction to microeconomics, this course will focus on a central topic, i.e. the price determination. The price will be determined by examining the demand and supply responses of consumers and companies, each of whom treat prices as parameters in their decision making.

**Prerequisite:**

None

**Textbook:**

William J. Baumol, Alan S. Blinder, Economics: Principles and Policy, 11th Edition, South-Western Cengage Learning, 2009 (ISBN-13: 978-0-324-58620-6)

**Reference:**

Campbell R. McConnell, Stanley L. Brue, Sean M. Flynn, Economics: Principles, Problems, and Policies, 18th Edition, Irwin/McGraw-Hill, 2008 (ISBN-13: 978-007-337569-4)

**Course objectives:**

To provide an opportunity to students to:

1. Use basic microeconomic concepts and theories to understand the economic world. [a]
2. Understand the fundamental laws which operate in all economies and financial markets. [g]
3. Demonstrate analytic skills to solve numerical problems and to interpret graphs. [a, c, k]
4. Apply their knowledge of mathematics and engineers to solve the price determination problems in the microeconomics, which related to their professional directions. [d, e]

**Topics covered:**

1. **Introduction to Economics** – The Subject Matter of Economics; The Problem of Scarcity; Fundamental Economic Questions; Capitalism and the Circular Flow of Economic Activity
2. **Demand, Supply and Equilibrium** – Demand; Supply; Demand, Supply and Equilibrium; Shifts in Demand and Equilibrium; Shifts in Supply and Equilibrium; The Price Mechanism and Its Functioning
3. **Demand, Supply and Elasticity** – Demand; Supply and Market Price; Elasticity of Demand; Elasticity and Total Revenue; Elasticity of Supply; Applications of Elasticity
4. **Theory of Consumer Demand and Utility** – Substitution and Income Effects and the Down Sloping Demand; The Law of Diminishing Marginal Utility; Utility Maximization and Consumer Equilibrium; Derivation of an Individual's Demand Curve; Consumer's Surplus
5. **Costs of Production** – Explicit Costs, Implicit Costs and Economic Profit; The Law of Diminishing Returns; Short-Run Total Cost; Short-Run Per Unit Costs; Long-Run Production Costs; Constant, Increasing and Decreasing Returns to Scale
6. **Perfect Competition** – Perfect Competition Demand; Profit Maximization in the Short Run; The Total Approach; Profit Maximization in the Short Run: Marginal Approach; Short-Run Profit or Loss; Firm's Short-Run Supply Curve; Long-Run Equilibrium of the Competitive Firm; Constant, Increasing and Decreasing Cost Industries
7. **Monopoly** – Pure Monopoly Defined; Demand and Marginal Revenue; Profit Maximization; Price Discrimination; Efficiency Considerations; Regulation of Monopoly

8. **Monopolistic Competition and Oligopoly** – Monopolistic Competition Defined; Profit Maximization; Long-Run Efficiency Implications of Monopolistic Competition; Oligopoly Defined; The Kinked-Demand Curve and Price Rigidity; Collusion; Long-Run Efficiency Implications of Oligopoly
9. **Production and the Demand for Economic Resources** – Introduction to Resource Pricing; Marginal Revenue Product under Perfect Competition; Profit Maximization and Resource Demand under Perfect Competition; Marginal Productivity and Resource Demand under Imperfect Competition; Changes in Resources Demand and Elasticity; A Firm’s Demand for Several Resources
10. **Wage Determination** – General Level of Wages; Wage Determination under Perfect Competition; Wage Determination with Imperfect Competition; The Effect of Unions on Wages; Wage Differentials
11. **Rent, Interest and Profits** – Rent; Interest; Profits; Income Shares; Epilogue on Commodity and Resource Pricing
12. **International Trade and Finance** – The Importance of International Trade; The Basis and the Gains from Trade; Comparative Advantage; Obstacles to the Flow of Trade; Tariffs and Quotas; The Balance of Payments; Flexible-Exchange-Rate System of Adjustment; Current International Economic Problems

**Class/laboratory schedule:**

Timetabled work in hours per week			No of teaching weeks	Total hours	Total credits	No / Duration of exam papers
Lecture	Tutorial	Practice				
2	1	0	14	56	3	2/ 3 hours

**Contribution of course to meet the professional component:**

This course prepares students to understand the importance of basic microeconomic issues in their lives.

**Relationship to EME Programme objectives and outcomes:**

This course primarily contributes to electromechanical engineering Programme outcomes that develop student abilities to:

- (a) An ability to apply knowledge of mathematics, science, and engineering;
- (c) An ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability;
- (d) An ability to function on multidisciplinary teams;
- (e) An ability to identify, formulate, and solve engineering problems.

The course secondarily contributes to electromechanical engineering Programme outcomes that develop student abilities to:

- (g) An ability to communicate effectively;
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice appropriate to the degree discipline.

**Course content:**

Maths	Basic Sciences	Engineering Science	Engineering Design and Synthesis	Complementary Studies	Computer Studies	Total 100%
25	0	75	0	0	0	100

**Persons who prepared this description:**

Dr. Yan Su

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## Part B General Course Information and Policies

### 1st Semester 2012/2013

Instructor: Dr. Yan Su  
Office Hour: TBA or by appointment  
Email: yansu@umac.mo

Office: B1-B704  
Phone: (853) 8397-8466

**Time/Venue:** Saturday (9:30-12:30) WLG105

### Assessment:

Final assessment will be determined on the basis of:

Home works:	10%
Quizzes:	20%
Mid-term:	30%
Final Exam:	40%

### Grading Distribution:

All undergraduate courses offered by FST should follow the grade guidelines listed below. If a course does not follow, the instructor should give justifications for the approval by the Board of Examiners.

- The percentage of the total of A and A- should not exceed 30%.
- The percentage of F should not exceed 25%. This percentage is counted prior to the re-sit examination.
- The average of the final marks (prior to the re-sit examination) should lie in the range from 68.0 to 80.0 (inclusive).
- The above guidelines are applied only to undergraduate classes with 15 students or above.

### Comment:

The objectives of the lectures are to explain and to supplement the text material. Students are responsible for the assigned material whether or not it is covered in the lecture. Students who wish to succeed in this course should read the textbook (chapter related) prior to the lecture, should work all home works and quizzes and should made use of the material provided at UMMoodle such as examples and extra material. You are encouraged to look at other sources (such as other textbooks, websites, etc.) to complement the lectures and text.

### Homework Policy:

The completion and correction of the 5 home works and 5 quizzes are a powerful learning experience; therefore:

- There will be approximately 5 home works and 5 quizzes, besides extra examples.
- Quizzes have a period for completion that must be respected. No late submission is accepted.

### Exams:

One mid-term exam and one final exam will be held during the semester.

### Note:

- Check UMMoodle (webcourse.umac.mo) for announcement, quizzes and lectures. Report any mistake on your grades within one week after posting.
- No make-up exam will be given except for CLEAR justification such as medical proof.
- Cheating and plagiarism are absolutely prohibited by the university.

## Appendix - Rubric for Programme Outcomes

Rubric for (a)	5 (Excellent)	3 (Average)	1 (Poor)
<b>Understand the theoretic background</b>	Students understand theoretic background and the limitations of the respective applications.	Students have some confusion on some background or do not understand theoretic background completely	Students do not understand the background or do not study at all
<b>Use a correct model and formulation correctly</b>	Students choose a model correctly and properly apply correct techniques	Students choose a wrong model sometime, use a wrong formula, or a different technique	Students use a wrong model and wrong formula, or do not know how to model
<b>Compute the problem correctly</b>	Students use correct techniques, analyze the problems, and compute them correctly	Students sometime solve problem mistakenly using wrong techniques	Students do not know how to solve problems or use wrong techniques completely

Rubric for (c)	5 (Excellent)	3 (Average)	1 (Poor)
<b>Design capability and design constraints</b>	Student understands very clearly what needs to be designed and the realistic design constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	Student understands what needs to be designed and the design constraints, but may not fully understand the limitations of the design constraints	Student does not understand what needs to be designed and the design constraints.
<b>Process to meet desired needs</b>	Student understands very clearly the process of the design	Student understands what the needs of the process design, but may not fully understand the limitations of the design constraints	Student does not understand the process.

<b>Rubric for (d)</b>	<b>5 (Excellent)</b>	<b>3 (Average)</b>	<b>1 (Poor)</b>
<b>Ability to work in teams</b>	Performance on teams is excellent with clear evidence of equal distribution of tasks and effort as well as frequent meetings of the team members.	Performance on teams is acceptable with one or more members carrying a larger amount of the effort as well as infrequent meetings of the members or one or more members being absent from several meetings.	Performance on teams is poor to unacceptable with one or two members clearly carrying the majority of the effort as well as inadequate team meeting or one or more members missing the majority of the meetings.
<b>Multi-disciplinary teams</b>	Team consists of members from two or more different engineering/science/business fields (this could contain some members not actually enrolled in the course but interacting as part of a competition, collaboration, etc.)	Team consists of members from two or more concentrations within the Department of Electromechanical Engineering	Team consists of members from the same concentration within the Department of Electromechanical Engineering

<b>Rubric for (e)</b>	<b>5 (Excellent)</b>	<b>3 (Average)</b>	<b>1 (Poor)</b>
<b>Identify applications in engineering systems</b>	Students understand problem and can identify fundamental formulation	Students understand problem but cannot apply formulation.	Students cannot identify correct terms for engineering applications
<b>Modeling, problem formulation and problem solving</b>	Students choose and properly apply the correct techniques	Students model correctly but cannot select proper technique or model incorrectly but solve correctly accordingly	Students at loss as to how to solve a problem

<b>Rubric for (g)</b>	<b>5 (Excellent)</b>	<b>3 (Average)</b>	<b>1 (Poor)</b>
<b>Professional Impact</b>	Student's/Team's/Group's document(s)/presentation(s) is/are considered to be of professional quality	Student's/Team's/Group's document(s)/presentation(s) is/are considered acceptable for college level work	Student's/Team's/Group's document(s)/presentation(s) is/are considered unacceptable for college level work
<b>Written Component</b>	Document is nearly error free with sophisticated use of vocabulary, formatted properly, with well developed concise sentences and paragraphs	Document contains some errors with a somewhat colloquial vocabulary, minor formatting issues, with some organizational issues that do not interfere with communication	Document contains many errors, very colloquial vocabulary, with severe organizational issues that interfere with communication. Document would be considered unacceptable.
<b>Oral Component</b>	Presentation is consistent, uniform, clear, direct, complete and captivating with very clear fonts and graphics with an excellent layout that clearly presents the technical content	Presentation is somewhat inconsistent between speakers, occasionally difficult to hear, with an acceptable layout containing acceptable fonts and graphics that adequately presents the technical content	Presentation is very inconsistent between speakers, difficult to hear with a poor layout containing illegible fonts and graphics that poorly presents the technical content. Would be considered unacceptable

<b>Rubric for (k)</b>	<b>5 (Excellent)</b>	<b>3 (Average)</b>	<b>1 (Poor)</b>
<b>Use modern hardware tools in engineering practice</b>	Student uses the hardware to measure and/or build engineering systems/designs correctly, and understands the limitations of the hardware.	Student uses the hardware to measure and/or build engineering systems/designs correctly.	Student does not use the hardware correctly.