

**University of Macau**  
**Department of Electromechanical Engineering**  
**MECH304 – Basic Macroeconomics**  
**Syllabus**  
**2<sup>nd</sup> Semester 2011/2012**  
**Part A – Course Outline**

**Compulsory course in Electromechanical Engineering**

**Catalog description:**

This course concentrates on the behavior of an entire economy, which is the sum of a large number of decision-making units including consumers, companies, and governments. This course will familiarize students with various concepts of macroeconomics and give them basic tools to analyze macroeconomic problems. The topics we shall address include: total output (GDP), aggregate demand and aggregate supply, unemployment, business cycles, inflation, and fiscal & monetary policy.

**Prerequisite:**

MECH314 – Basic Microeconomics

**Textbook:**

- William J. Baumol, Alan S. Blinder, *Economics: Principles and Policy*, 11<sup>th</sup> 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)
- John Sloman, *Economics*, 1st Edition, the University Press, Cambridge, 1991 (ISBN 0-7450-0859-3)

**Course objectives:**

To provide an opportunity to students to:

1. understand the relationships among key macroeconomic variables, how they are affected by government policy, and how they affect the decisions of firms and consumers [e, g, k]
2. analyze and interpret contemporary economic policy issues; understand the fundamental laws which operates in financial markets [d, g]
3. demonstrate analytic skills to solve numerical problems and to interpret graphs [a]
4. understand the effects of various policies in macroeconomics on the future of their professional fields [c]

**Topics covered:**

1. **Introduction to Macroeconomics** – The Subject Matter of Economics; The Problem of Scarcity; Fundamental Economic Questions; Capitalism and the Circular Flow of Economic Activity
2. **Aggregate Demand, Supply and Equilibrium** – Aggregated Demand; Aggregated Supply; Shifts in Aggregate Demand, Supply, and Equilibrium
3. **National Income Accounting** – Measuring national Output; Personal Income and Disposable Income; Changes in GNP and GDP
4. **Saving, Consumption and Investment** – Circular Flow in a Private Sector Model; Saving and Investment in Classical Analysis; Keynesian Analysis of Consumption and Saving; Investment
5. **The Determination of National Income** – Saving Investment and Equilibrium; The Multiplier Effect; Equilibrium Income and Full Employment
6. **Fiscal Policy** – Government Spending, Taxes and the Level of Income; Discretionary Fiscal Policy; Fiscal Policy Multipliers; Built-In Stabilizers; The Public Debt
7. **The Business Cycle** – Full Employment; Inflation; Business Cycles; The Acceleration Principle
8. **The Role and Importance of Money** – Money; The Equation of Exchange; The Quantity Theory of Money; The Financial System

9. **Commercial Banks and the Money Supply** – Regulation of Demand Deposit Volume; Demand Deposit Creation by the Commercial Banking System; Money Creation; Managing a Commercial Bank’s Assets
10. **The Federal Reserve and Monetary Policy** – Controlling Demand-Deposit Volume; Dynamic and Defensive Open –Market Operations; Selective Credit Controls
11. **Synthesis of Monetary and Income Analysis** – The Effect of Money Supply Changes; A Keynesian View; The Effect of Money Supply Changes: A Monetarist View; The Velocity of Money; Monetary vs. Fiscal Policy
12. **Full Employment and Price Stability** – Simple Demand-Pull and Cost –Push Models of Inflation; Bottleneck Inflation; The Phillips Curve; The Natural Rate of Unemployment
13. **Economic Growth** – The Determinants of Economic Growth; Population and Economic Growth; Full-Employment Growth; The Desirability of Economic Growth

**Class schedule and credits:**

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

**Topic outline:**

Week No.	No. of hours	Topics
1	3	Introduction to Economics
2	3	Aggregate Demand, Supply and Equilibrium
3	3	National Income Accounting
4	3	Saving, Consumption and Investment
5	3	Determination of National Income– Saving Investment and Equilibrium
6	3	Determination of National Income–Equilibrium Income and Full Employment
7	3	Fiscal Policy
8	3	The Business Cycle
9	3	The Role and Importance of Money
10	3	Commercial Banks and the Money Supply
11	3	The Federal Reserve and Monetary Policy
12	3	Synthesis of Monetary and Income Analysis
13	3	Full Employment and Price Stability
14	3	Economic Growth

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

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

**Relationship to Electromechanical Engineering 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 Science	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

### 2<sup>nd</sup> Semester 2011/2012

Instructor: Dr. Yan Su  
Office Hour: Friday 10:00-13:00  
Email: yansu@umac.mo

Office: B1-B704  
Phone: (853) 8397-8466 6658-0708

### Time/Venue:

TBA

### Assessment:

Final assessment will be determined on the basis of:

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

### Grading System:

The credit is earned by the achievement of a grade from 'A' to 'D'; 'F' carries zero credit.

Following four items are the grade distribution rules:

- 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 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 finish home works and quizzes on time. Also students 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 home works and quizzes are a powerful learning experience; therefore:

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

### Exams:

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

### Note:

- Check UMMoodle (webcourse.umac.mo) for announcement, home works, 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.