

**University of Macau**  
**Department of Electromechanical Engineering**  
**MECH413 - Production Cost Analysis and Marketing**  
**Syllabus**  
**2<sup>nd</sup> Semester 2011/2012**  
**Part A – Course Outline**

**Required elective course in Electromechanical Engineering**

**Course description:**

The aim of the course is to expose the students to some basic concept of production marketing principles, especially in the formulation of marketing strategies. Industrial marketing strategies should be applied to enhance the competition of production. Industrial marketing research method is introduced to extend the mindset of engineering student in production market planning. New marketing technology (e-commerce) is introduced to increase product competitive advantages and reduce the cost of production.

**Prerequisite:**

None

**Textbook:**

- Uma Sekaran. *Research Methods for Business – A Skill – Building Approach*, 5th Edition, Wiley, 2010.
- Don R. Hansen, Maryanne M. Mowen, Liming Guan. *Cost Management - Accounting and Control*, 6th edition, South-Western College Pub, 2007.

**References:**

- Michael J. Baker. *The Marketing Book*, 5th Edition, Heinemann Professional Publishing, 2002.
- Efraim Turban, Jae K. Lee, David King, Ting Peng Liang. *Electronic Commerce 2010 – A Managerial Perspective*, 6th edition, Prentice Hall, 2009.
- Derek F. Abell & John S. Hammond. *Strategic Market Planning: Problems and Analytical Approaches*, Prentice-Hall International Editions, 1979.

**Course objectives:**

1. Introduce to students to organize the production cost analysis and marketing research project. [d, g]
2. Introduce to students mathematical modeling for data analysis by professional software. [a, b, l]
3. Introduce to students e-commerce concept application for marketing improvement. [h]

**Topics covered:**

1. **Data Collection** – Data Collection Methods; Primary Data Collection; Secondary Data Collection
2. **Questionnaire Design and Survey** – Questionnaire Avoid; Sampling Method and Data Analysis Aspect
3. **Marketing Research Method** – Define Theoretical Framework for Research Topic; Define Hypothesis for Research Topic; Make up Operational Definition
4. **Data Analysis and Interpretation** – Base on Theoretical Framework, Hypothesis, Different Analysis Method
5. **Strategic Decision Making** – Introduction of Strategic Decision Making; The Analytic Hierarchy Process (AHP)
6. **Production Management with emphasis on Cost Analysis** – The Role of the Firm; The Firm and the Market; Maximize Profit; Production Tables and Production Functions; The Law of Diminishing Marginal Productivity; The Costs of Production
7. **E-commerce Concept Application** – Business to Consumer (B2C); Business to Business (B2B); Internet Technologic Application
8. **Formulation of Marketing Strategies** – Types of strategies; Strategic models

**Class schedule and credits:**

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

### Topic outline:

Week No.	No. of hours	Topics	Textbook
1	1	Introduction of Production Cost Analysis and Marketing Course Project Requirement Marketing in 21 <sup>st</sup> Century Gathering Information and Measuring Market Demand MIS Research Sample – Global Sources	Notes_1b.ppt CH01_Alfred.ppt MIS.ppt Database.ppt Globalsources.ppt
1	1	Production / Industrial Marketing Research Method American Airline Example Theoretical Framework	CH02_Alfred.ppt CH02bAlfred.ppt Hypothesis.ppt
2	2	<i>Presentation Practice:</i> Gathering Information for Industrial Marketing Research	
2	2	Winning Markets – Market Oriented Strategic Planning Building Customer Satisfaction through Quality, Service and Value Theoretical Framework Higher level practice Hypothesis	CH03_Alfred.ppt CH04_Alfred.ppt Hypothesis.ppt
3	2	<i>First Presentation of Course Project:</i> Theoretical Framework Practice	
3	2	Operational Definition – Questionnaire Operational Practice Relevant Information/Cases about Projects	Opera_Def3.ppt
4	2	<i>Hypothesis Practice &amp; Quiz</i>	
4	2	Questionnaire avoid Sampling Method	Ques_avoid.ppt Sampling.ppt
5	2	Progress Presentation – Theoretical Framework, Research Design, Hypothesis and Operational Definition	
5	2	Data Analysis and Interpretation I	Dataanalysis.ppt
6	2	Questionnaire Design Presentation with Sampling	
6	2	Data Analysis and Interpretation II	Dataanalysis.ppt
7	2	Advanced Questionnaire Design Presentation	
7	2	Data Analysis and Interpretation with Excel	notes
8	2	Workshop of Data Analysis with Excel	notes
8	2	Data Analysis and Interpretation with SPSS	notes
9	2	Workshop for SPSS	notes
9	2	Implementation of Industrial Marketing Research	notes
10	2	Data Interpretation of Pilot Study	notes
10	2	Research Report	Report.ppt
11	2	<b>Final Questionnaire Design Presentation</b>	
11	2	Case Studies	notes
12	2	First Draft of Research Report (Presentation)	
12	2	Quiz	
13	2	Introduction to e-Commerce e-Commerce Cake or Rice Infrastructure of e-Commerce Business Model Business to Consumer (B2C)	e-com.ppt, internet.ppt e-com_cake_ri.pdf MECH413_03a.ppt MECH413_03b.ppt MECH413_03c.ppt

		Business to Consumer / Business (B2B) Strategies for Web Auctions, Virtual Communities and Web Portals	chap02.ppt, chap03.ppt chap05.ppt, chap06.ppt, ch10.ppt
13	2	Payment System and Security Control Electronic Data interchange International, Legal, Ethical, and Tax Issues Implementing Electronic Commerce	chap08.ppt, chap10.ppt, ch11.ppt ch12.ppt
14	2	Final Presentation of Course Project	

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

This course prepares students to work professionally in the area of **engineering management**.

**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;
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data;
- (d) an ability to function on multidisciplinary teams;

The course secondarily contributes to Electromechanical Engineering program outcomes that develop student abilities to:

- (g) an ability to communicate effectively;
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context, especially the importance of health, safety and environmental considerations to both workers and the general public, especially the importance of health, safety and environmental considerations to both workers and the general public;
- (l) an ability to use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitations.

**Course content:**

Maths	Basic Sciences	Engineering Science	Engineering Design and Synthesis	Complementary Studies	Computer Studies	Total 100%
20	0	20	10	25	25	100

**Persons who prepared this description:**

Dr. Seng Fat Wong

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## Part B – General Course Information and Policies

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

Instructor: Dr. Seng Fat Wong  
Office Hour: By appointment  
Email: fstsfw@umac.mo

Office: N403  
Phone: (853) 8397-4453

#### Time/Venue:

TBA

#### Assessment:

Final assessment will be determined on the basis of:

Attendance and in-class Performance: 5%  
Homework: 10%  
In-class Quizzes: 15%  
Course Project: 30%  
Final Exam (Comprehensive): 40%

#### Grading System:

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

Grades are awarded according to the following system:

Letter Grades	Grade Points	Percentage
A	4.0 (Excellent)	93-100
A-	3.7 (Very good)	88-92
B+	3.3	83-87
B	3.0 (Good)	78-82
B-	2.7	73-77
C+	2.3	68-72
C	2.0 (Average)	63-67
C-	1.7	58-62
D+	1.3	53-57
D	1.0 (Pass)	50-52
F	0 (Fail)	Below 50

#### 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 homework and in-class quizzes and should make 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 homework is a powerful learning experience; therefore:

- There will be approximately 7 homework assignments.
- Homework is due one week after assignment unless otherwise noted, no late homework is accepted.
- Possible revision of homework grades may be discussed with the grader within one week from the return of the marked homework
- The homework grade will be based on the average of the assignment grades.

#### Quizzes/Mid-terms Exams:

Approximately 4 quizzes and one final exam will be held during the semester.

**Note:**

- Check UMMoodle ([ummoodle.umac.mo](http://ummoodle.umac.mo)) for announcement, e-quizzes and lectures. Report any mistake on your grades within one week after posting.
- Attendance is strongly recommended.
- No make-up exam is give except for CLEAR medical proof.
- No exam is given if you are 30 minutes late in the final exam. Even if you are late in the exam, you must turn in at the due time.
- Cheating is absolutely prohibited by the university.

## Appendix - Rubric for Program 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 (b)	5 (Excellent)	3 (Average)	1 (Poor)
<b>Conduct experiments</b>	Student successfully completes the experiment, records the data, analyzes the experiment's main topics, and explains the experiment concisely and well.	Student successfully completes the experiment, records the data, and analyzes the experiment's main topics.	Student either does not complete the experiment successfully, or completes it successfully but does not record the correct data.
<b>Design experiments</b>	Student understands what needs to be tested and designs an appropriate experiment that takes into account the limitations of the equipment and measurement accuracy.	Student understands what needs to be tested and designs an appropriate experiment, but may not fully understand the limitations of the measurements.	Student does not understand what needs to be tested and/or does not design an appropriate experiment.

Rubric for (d)	5 (Excellent)	3 (Average)	1 (Poor)
<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 (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 (h)</b>	<b>5 (Excellent)</b>	<b>3 (Average)</b>	<b>1 (Poor)</b>
<b>Scope of Content</b>	Students will demonstrate material, items, or topics characterized by a sophisticated array of information, insight, and understanding.	Students demonstrate significance reflecting an acceptable degree of perception and thoughts.	Students have limited abilities to relate, incorporate, or demonstrate knowledge of subject with a dynamic breadth.
<b>Impact of Process</b>	Students will employ techniques, designs, ideas, and knowledge demonstrating a profound ability to improve and possess broad applications with a keen a series of actions, changes, or functions	Techniques, designs, ideas, and knowledge present some understanding and ability to demonstrate progression, significance, and influence.	Techniques, designs, ideas, and knowledge present limited progression, significance, and influence

<b>Rubric for (l)</b>	<b>5 (Excellent)</b>	<b>3 (Average)</b>	<b>1 (Poor)</b>
<b>Use modern computer and software tools in engineering practice</b>	Student uses the computer and software to correctly analyze engineering problems and/or create engineering designs, and understands the limitations of the software.	Student uses the computer and software to correctly analyze engineering problems and/or create engineering designs.	Student does not use the computer and software to correctly create engineering designs and/or does not correctly interpret the results.