

## COURSE OUTLINE

<b>FACULTY OF MECHANICAL ENGINEERING</b>	<b>Page : 1 of 6</b>
<b>SKMM 2713 MANUFACTURING PROCESSES</b>	<b>Revision</b> : <b>Date of issue</b> : 18th February 2015 <b>Last Amendment</b> : 18th February 2015 <b>Edition</b> :

<b>PRE-REQUISITE</b> :			
<b>EQUIVALENCE</b> :			
<b>LECTURE HOURS</b> : <b>3 Hours Lecture</b>			
Lecturers	E-Mail	Room No.	Phone No.
1. Mr. Rozaimi Mohd. Saad	rozaimi@utm.my	C25-327	019-7717933
2. Dr. Richard Foo Jin Hoe	jinhoe@utm.my	C25-336	018-779 4577
3. Dr. Mohd Faridh bin Ahmad Zaharuddin	faridh@utm.my	C24-324	013-236 2347
4. Mr. Zulkepli Hj Muhammad	zulkepli@mail.fkm.utm.my	C25-331	07-5534746
5. Dr. Mohd Azlan Suhaimi	azlansuhaimi@utm.my	C23-323	019-724 8581

### **SYNOPSIS**

This course discusses the fundamental aspect of various traditional and non-traditional manufacturing processes for processing metal and non-metal components as well as sustainable manufacturing concepts. It starts from the overall introduction on manufacturing aspects, followed by polymer shaping processes, casting processes, joining processes, metal forming processes, and machining processes including CNC/CAD/CAM technologies. At the end of this course, the students should be able to select suitable manufacturing processes to produce a part/product. The knowledge gained from this course also allows students to make right decision in designing products based on process requirements.

<p><b><u>PREPARED BY :</u></b></p> <p><b>Name</b> : NORIZAH REDZUAN/ROZAIMI MOHD. SAAD</p> <p><b>Signature</b> :</p> <p><b>Date</b> : 18<sup>th</sup> February 2015</p>	<p><b><u>CERTIFIED BY :</u></b></p> <p><b>Name</b> : Head of Department</p> <p><b>Signature</b> :</p> <p><b>Date</b> : 18<sup>th</sup> February 2015</p>
---	--

# COURSE OUTLINE

<b>FACULTY OF MECHANICAL ENGINEERING</b>	Page : 2 of 6
<b>SKMM 2713 MANUFACTURING PROCESSES</b>	<b>Revision</b> : <b>Date of issue</b> : 18th February 2015 <b>Last Amendment</b> : 18th February 2015 <b>Edition</b> :

## COURSE LEARNING OUTCOMES

By the end of the course, students should be able to :

No.	Course Learning Outcomes	Programme Learning Outcome(s) Addressed	Learning Taxonomy & Generic Skill Assessed	Assessment Methods
1.	<b>Identify</b> theories & working principles related to complex manufacturing processes, manufacturing aspects and problems	PO1	C4	T, F
2.	<b>Compare and analyze</b> advantages and disadvantages of relevant complex manufacturing systems and processes	PO1	C4	T, F
3.	<b>Explain</b> sustainable manufacturing concepts <b>and correlate</b> the relevant issues to respected manufacturing processes.	PO7	C4	T, F, PR
4.	<b>Solve and Suggest</b> suitable manufacturing techniques and manufacturing aspects for improving quality of a given product in group project report.	PO3, PO5	C4 A3, TS1, TS2, TS3	T, F, PR, Peer Review

Note :

(T – Test ; PR – Project ; Q – Quiz; HW – Homework ; Pr – Presentation; F – Final Exam)

## COURSE OUTLINE

<b>FACULTY OF MECHANICAL ENGINEERING</b>	Page : 3 of 6
<b>SKMM 2713 MANUFACTURING PROCESSES</b>	Revision : Date of issue : 18th February 2015 Last Amendment : 18th February 2015 Edition :

**STUDENT LEARNING TIME :**

No.	Teaching and Learning Activities	Student Learning Time (hours)
1.	Face to Face - Lectures - Practical / Tutorial/Studio - SCL Activities	36 12 6
2.	Independent Study - Non-face to face learning - Revision, Preparation for Assessment - Group project	22 18 20
3.	Formal Assessment - Continuous Assessment - Final Exam	3 3
<b>Total</b>		<b>120</b>

**TEACHING METHODOLOGY**

1. Lectures and discussions
2. Students will be required to conduct a group layout design project , write reports and present either the project or other related issues.
3. Videos and demonstration will be given on related topics.

# COURSE OUTLINE

<b>FACULTY OF MECHANICAL ENGINEERING</b>	Page : 4 of 6
<b>SKMM 2713 MANUFACTURING PROCESSES</b>	Revision : Date of issue : 18th February 2015 Last Amendment : 18th February 2015 Edition :

## WEEKLY SCHEDULE

Week	Lecture	Topic / Content
1	1 2 3	<b>(Chapter 1 - Introduction to Manufacturing)</b> Introduction Sustainability issues in manufacturing Classification of manufacturing Process selection Material selection
2	4 5 6	<b>(Chapter 2 - Manufacturing Aspects)</b> Introduction Specification Standard Assembly product production method Limits and fits. *Group project instruction
3	7 8 9	<b>(Chapter 3 - Polymer and Polymer Processes)</b> Introduction Criteria of plastic selection Additives in plastics Plastic processing
4-5	10  11 12 13  14 15	<b>(Chapter 4 - Casting Processes)</b> Introduction Pattern, Moulding, Gating system, and Core. Casting processes, Non permanent/expandable mould casting processes. Permanent mould casting processes Casting design & Basic principal. Casting defects
6-7	16 17 18 19 20 21	<b>(Chapter 5 - Metal Forming Processes)</b> Introduction Rolling process Forging process Extrusion process. Rod and wire drawing Sheet metal forming
8		<b>MID SEMESTER BREAK</b>

## COURSE OUTLINE

<b>FACULTY OF MECHANICAL ENGINEERING</b>	Page : 5 of 6
<b>SKMM 2713 MANUFACTURING PROCESSES</b>	<b>Revision</b> : <b>Date of issue</b> : 18th February 2015 <b>Last Amendment</b> : 18th February 2015 <b>Edition</b> :

### WEEKLY SCHEDULE

Week	Lecture	Topic / Content
9-10	22 23 24 25 26 27	<b>(Chapter 6 - Joining Processes)</b> Introduction and classification Soldering and Brazing Welding processes Joint quality and weld joint test. Mechanical joining process
11-13	28 29 30 31 32 33 34 35 36	<b>(Chapter 7 - Machining Processes)</b> Introduction Mechanics of cutting Tool life Cutting tool materials Cutting fluid Turning operation Milling operation  *Group project submission
14-15	37 38 39 40 41 42	<b>CAD/CAM/CNC</b> Introduction CAD/CAM CNC Technology Part programming (G & M codes - Milling)
<b>16-18</b>		<b>REVISION WEEK AND FINAL EXAMINATION</b>

## COURSE OUTLINE

<b>FACULTY OF MECHANICAL ENGINEERING</b>	Page : 6 of 6
<b>SKMM 2713 MANUFACTURING PROCESSES</b>	<b>Revision</b> : <b>Date of issue</b> : 18th February 2015 <b>Last Amendment</b> : 18th February 2015 <b>Edition</b> :

**Main Text book :**

Kalpakjian, S.Schmid, S (2012), Manufacturing Engineering and Technology, 7<sup>th</sup> Edition, Addison Wesley

**REFERENCES :**

1. Groover, M.P., 'Fundamentals of Modern Manufacturing', 3<sup>rd</sup> edition, John Wiley, 2007
2. DeGarmo, E.P., "*Materials and Processes in Manufacturing*", 10<sup>th</sup> edition, John Wiley, 2008
3. Zainal Abidin Ahmad (1999), Proses Pembuatan Jilid I, Penerbit UTM
4. Zainal Abidin Ahmad (1998), Proses Pembuatan Jilid II, Penerbit UTM
5. Lecture notes SME 2713 at <http://elearning.utm.my> or <http://www.fkm.utm/~zulkepli/>

**GRADING**

No.	Assessment	Number	% each	% total	Dates
1.	Test 1	1	20	20	
2.	Test 2	1	15	15	
3.	Individual/Group Assignment	2	5	10	
4.	Group Project	1	10	10	
5.	Team working	1	5	5	
6.	Final Exam	1	40	40	
<b>Overall Total</b>				<b>100</b>	

**ATTENDANCE**

The student should adhere to the rules of attendance as stated in the University Academic Regulation :-

1. Student must attend not less than 80% of lecture hours as required for the subject.
2. The student will be prohibited from attending any lecture and assessment activities upon failure to comply the above requirement. Zero mark will be given to the subject.