

# Faculty of Science

## BE BCom Program

*(Materials Science and Engineering)*

2009

### Overview

The School of Materials Science and Engineering within the Faculty of Science offers the degree of Bachelor of Engineering (Program code: 3135). Each student may specialise in a particular field of Materials Science and Engineering by taking a range of appropriate electives in the final stages of the program.

There are four study plans:

- BE in Physical Metallurgy (MATSE13135)
- BE in Process Metallurgy (MATSG13135)
- BE in Materials Engineering (MATSH13135)
- BE in Ceramic Engineering (MATSJ13135)

The following information provides an outline of the courses that must be completed in order to satisfy the requirements of the combined degrees in Engineering (BE) and Commerce (BCom). A particular major in the Commerce program can be completed by choosing appropriate courses. Examples are included in section 2.

# 1. Engineering Program

## STAGE 1

<i>Session 1</i>		UOC	S1	S2
ENGG1000	Introduction to Engineering Design and Innovation	6	6	-
MATH1131	Mathematics 1A	6	6	-
PHYS1121	Physics 1A	6	6	-
<i>Recommended electives</i>				
	CHEM1011 or CHEM1031 or CEIC1001	6	6	-
<b>Commerce Courses</b>		<b>0</b>	<b>0</b>	
<i>Session 2</i>				
ENGG1811	Computing for Engineers			
	or			
COMP1911	Computing 1	6	-	6
MATH1231	Mathematics 1B	6	-	6
<i>Required elective</i>				
MATS1192	Design and Application of Materials in Engineering	6	-	6
<i>Recommended elective</i>				
	CVEN1300 or MINE1300 or MMAN1300	6	-	6
<b>Commerce Courses</b>		<b>0</b>		<b>0</b>
<b>Total</b>		<b>48</b>	<b>24</b>	<b>24</b>

## STAGE 2

<i>Session 1</i>		UOC	S1	S2
CHEM2718	Physical Chemistry for Materials Science & Engineering	3	3	-
MATH2019	Engineering Mathematics 2CE	6	6	-
MATS1002	Microstructural Analysis	3	3	-
MATS1172	Physical Properties of Materials	3	3	-
MATS1232	Materials Engineering 1A	3	3	-
<b>Commerce Courses</b>		<b>6</b>	<b>6</b>	<b>-</b>
<i>Session 2</i>				
<b>Engineering/Science Courses</b>		<b>0</b>	<b>-</b>	<b>0</b>
<b>Commerce Courses</b>		<b>24</b>	<b>-</b>	<b>24</b>
<b>Total</b>		<b>48</b>	<b>24</b>	<b>24</b>

### STAGE 3

<i>Session 1</i>		UOC	S1	
MATS1262	Mechanical Properties of Materials	6	6	-
<b>Commerce Courses</b>		<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
MATH2089	Numerical Methods and Statistics	6	-	6
MATS1112	Phase Equilibria	3	-	3
MATS1142	Crystallography and X-ray Diffraction	3	-	3
MATS1152	Materials Engineering 1B	6	-	6
MATS1282	Thermodynamics of Materials	6	-	6
<b>Commerce Courses</b>		<b>0</b>	<b>-</b>	<b>0</b>
Total		48	24	24

### STAGE 4

<i>Session 1</i>		UOC	S1	S2
MATS1013	Diffusion and Kinetics	3	3	-
MATS2013	Ceramic Materials	3	3	-
MATS4013	Physical Metallurgy	3	3	-
MATS5013	Materials Processing	6	6	-
MATS3443	Polymer Science and Engineering	3	3	-
<b>Commerce Courses</b>		<b>6</b>	<b>6</b>	<b>-</b>
<i>Session 2</i>				
MATS5342	Computational Modelling and Design in Mat Eng	6	-	6
2 Professional Electives		6	-	6
<b>Commerce Courses</b>		<b>12</b>	<b>-</b>	<b>12</b>
Total		48	24	24

## STAGE 5

<i>Session 1</i>		UOC	S1	S2
MATS1354	Design Project	3	3	-
MATS1464	Professional Communication and Presentation	3	3	-
MATS3624	Materials Engineering Project	18	12	-
	or			
MATS3724	Materials Engineering Project	24	12	-
	<b>Commerce Courses</b>	<b>6</b>	<b>6</b>	<b>-</b>
<i>Session 2</i>				
MATS1244	Materials Industry Management A	6	-	6
MATS3624	Materials Engineering Project	18	-	6
and	4 Professional Electives	12	-	12
	or			
MATS3724	Materials Engineering Project	24	-	12
and	2 Professional Electives	6	-	6
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
Total		48	24	24

## STAGE 6

<i>Session 1</i>		UOC	S1	S2
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
	<b>Commerce Courses</b>	<b>24</b>	<b>24</b>	<b>-</b>
Total		24	24	-

## Professional Electives in BE Program (3 UoC per course)

### *BE in Physical Metallurgy*

MATS1223	Corrosion control
MATS4023	Phase transformations
MATS4083	Physical metallurgy of alloys
MATS4133	Deformation and strengthening mechanisms
MATS4213	Fractographic analysis
MATS4333	Fracture mechanics
MATS1214	Welding and other joining processes
MATS1414	Surface treatments and wear
MATS3064	Composite materials
MATS4064	Thermomechanical processing
MATS4084	Specialty alloys
MATS1343	Materials industry management B
MATS5424	Modelling in materials engineering 2
NANO3420	Fabrication of nanostructured devices

### *BE in Process Metallurgy*

MATS1223	Corrosion control
MATS2183	Refractories
MATS4023	Phase transformations
MATS5033	Extractive metallurgy
MATS5043	Heat, fluid and mass flow
MATS5423	Pyrometallurgy 1
MINE3800	Minerals processing
MATS5394	Pollution control in materials processing
MATS5424	Modelling in Materials Engineering 2
MATS1343	Materials industry management B
MATS5524	pyrometallurgy 2

### *BE in Materials Engineering*

MATS1223	Corrosion control
MATS3564	Polymer engineering 1
MATS4023	Phase transformations
MATS4133	Deformation and strengthening mechanisms
MATS4213	Fractographic analysis
MATS4333	Fracture mechanics
MATS1414	Surface treatments and wear
MATS2294	Mechanical and thermal properties of ceramics
MATS2314	Glass-based ceramics
MATS3064	Composite materials
MATS3574	Polymer engineering 2
MATS1343	Materials industry management B
MATS5424	Modelling in materials engineering 2
NANO3420	Fabrication of nanostructured devices

### *BE in Ceramic Engineering*

MATS1163	Chemistry of the solid state
MATS1223	Corrosion control
MATS2183	Refractories
MATS2363	Ceramics processing and design
MATS4023	Phase transformations
MATS4333	Fracture mechanics
MATS2203	Physico-chemical ceramics laboratory
MATS2263	Sintering of ceramics
MATS2294	Mechanical and thermal properties of ceramics
MATS2314	Glass-based ceramics
MATS1343	Materials industry management B
MATS5394	Pollution control in materials processing
MATS5424	Modelling in materials engineering 2
NANO3420	Fabrication of nanostructured devices

## 2. Commerce Program

This section contains an outline of the Commerce Program Structure for the joint BE BCom degree program illustrating a few of the possible majors.

### 2.1 Finance major

#### STAGE 1

<i>Session 1</i>		UOC	S1	S2
	<b>Commerce Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>24</b>	
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

#### STAGE 2

<i>Session 1</i>		UOC	S1	S2
ECON 1101	Microeconomics 1	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
ECON1102	Macroeconomics 1	6	-	6
ACCT1501	Accounting and Financial Management 1A	6	-	6
FINS1612	Capital markets and Institutions	6	-	6
	Commerce Course for Major/Minor Option	6	-	6
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
Total		48	24	24

#### STAGE 3

<i>Session 1</i>		UOC	S1	S2
ACCT1511	Accounting and Financial Management 1B	6	6	-
FINS1613	Business Finance	6	6	-
	Commerce Courses for Major/Minor Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>6</b>	<b>6</b>	
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

## STAGE 4

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<i>Session 1</i>		UOC	S1	S2
	Commerce Course for Major/Minor Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<hr/>				
<i>Session 2</i>				
FINS2624	Portfolio Management	6	-	6
	Commerce Course for Major/Minor Option	6	-	6
	<b>Engineering/Science Courses</b>	<b>12</b>	<b>-</b>	<b>12</b>
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	Total	48	24	24

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## STAGE 5

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<i>Session 1</i>		UOC	S1	S2
FINS****	Finance Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<hr/>				
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
<hr/>				
	Total	48	24	24

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## STAGE 6

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<i>Session 1</i>		UOC	S1	S2
FINS****	4 Finance Options	24	24	-
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
<hr/>				
	Total	24	24	-

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## 2.2 International Business major

### STAGE 1

<i>Session 1</i>		UOC	S1	S2
	<b>Commerce Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>24</b>	
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

### STAGE 2

<i>Session 1</i>		UOC	S1	S2
ECON 1101	Microeconomics 1	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
ECON1102	Macroeconomics 1	6	-	6
ACCT1501	Accounting and Financial Management 1A	6	-	6
IBUS1101	Global Business Environment	6	-	6
IBUS1102	Managing Across Cultures	6	-	6
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
Total		48	24	24

### STAGE 3

<i>Session 1</i>		UOC	S1	S2
ACCT1511	Accounting and Financial Management 1B	6	6	-
IBUS2101	International Business and Multinational Organisations	6	6	-
	Commerce Courses for Major/Minor Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>6</b>	<b>6</b>	
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24



## STAGE 4

<i>Session 1</i>		UOC	S1	S2
	Commerce Course for Major/Minor Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
IBUS3101	International Business Strategy	6	-	6
IBUS2103	Comparative management Systems in East Asia	6	-	6
	<b>Engineering/Science Courses</b>	<b>12</b>	<b>-</b>	<b>12</b>
Total		48	24	24

## STAGE 5

<i>Session 1</i>		UOC	S1	S2
IBUS****	International Business Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

## STAGE 6

<i>Session 1</i>		UOC	S1	S2
IBUS****	International Business Options	12	12	-
	Commerce Courses for Major/Minor Option	12	12	-
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
Total		24	24	-

## 2.3 Business Strategy and Economic Management major

### STAGE 1

<i>Session 1</i>		UOC	S1	S2
	<b>Commerce Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>24</b>	
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

### STAGE 2

<i>Session 1</i>		UOC	S1	S2
ECON 1101	Microeconomics 1	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
ECON1102	Macroeconomics 1	6	-	6
ACCT1501	Accounting and Financial Management 1A	6	-	6
	Commerce Courses for Major/Minor Option	12	-	12
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
Total		48	24	24

### STAGE 3

<i>Session 1</i>		UOC	S1	S2
ACCT1511	Accounting and Financial Management 1B	6	6	-
ECON 2101	Microeconomics 2	6	6	-
	Commerce Courses for Major/Minor Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>6</b>	<b>6</b>	
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

## STAGE 4

<i>Session 1</i>		UOC	S1	S2
	Commerce Course for Major/Minor Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
ECON2105	Economics of Corporations	6	-	6
ECON2***	Economics Option [with prereq]	6	-	6
	<b>Engineering/Science Courses</b>	<b>12</b>	<b>-</b>	<b>12</b>
Total		48	24	24

## STAGE 5

<i>Session 1</i>		UOC	S1	S2
ECON2112	Game Theory and Business Strategy	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

## STAGE 6

<i>Session 1</i>		UOC	S1	S2
ECON3121	Managerial Economics	6	6	-
ECON****	Economics Option	6	6	-
	Commerce Courses for Major/Minor Option	12	12	-
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
Total		24	24	-

## 2.4 Marketing major

### STAGE 1

<i>Session 1</i>		UOC	S1	S2
	<b>Commerce Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>24</b>	
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

### STAGE 2

<i>Session 1</i>		UOC	S1	S2
ECON 1101	Microeconomics 1	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
ECON1102	Macroeconomics 1	6	-	6
ACCT1501	Accounting and Financial Management 1A	6	-	6
MARK1012	Marketing Fundamentals	6	-	6
	Commerce Course for Major/Minor Option	6	-	6
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
Total		48	24	24

### STAGE 3

<i>Session 1</i>		UOC	S1	S2
ACCT1511	Accounting and Financial Management 1B	6	6	-
MARK2051	Consumer behaviour	6	6	-
MARK2052	Marketing Research	6	6	-
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

## STAGE 4

<i>Session 1</i>		UOC	S1	S2
	Commerce Course for Major/Minor Option	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
MARK2053	Marketing Communications and Promotions Management	6	-	6
MARK2054	Market Analysis	6	-	6
	<b>Engineering/Science Courses</b>	<b>12</b>	<b>-</b>	<b>12</b>
Total		48	24	24

## STAGE 5

<i>Session 1</i>		UOC	S1	S2
MARK3081	Distribution Strategy	6	6	-
	<b>Engineering/Science Courses</b>	<b>18</b>	<b>18</b>	<b>-</b>
<i>Session 2</i>				
	<b>Commerce Courses</b>	<b>0</b>	<b>-</b>	<b>0</b>
	<b>Engineering/Science Courses</b>	<b>24</b>	<b>-</b>	<b>24</b>
Total		48	24	24

## STAGE 6

<i>Session 1</i>		UOC	S1	S2
MARK3082	Strategic Marketing Management	6	6	-
MARK****	Marketing Option	6	6	-
	Commerce Course for Major/Minor Option	12	12	-
	<b>Engineering/Science Courses</b>	<b>0</b>	<b>0</b>	<b>-</b>
Total		24	24	-