



الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يُونَيْتِي إِسْلَامًا، إِنْتَارَا بَعْثًا مَلِيْسِيَا

MASTER AND PHD PROGRAMMES AT KULLIYYAH OF ENGINEERING

Updated July 2017

KULLIYAH OF ENGINEERING

CONTACT DETAILS

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The Kulliyyah of Engineering was established in 1994 with three departments. The Kulliyyah, fondly known as KOE has now grown into seven departments with various research units/groups. Kulliyyah of Engineering envisioned to be “A Global Centre of Innovative Engineering Education and Research with Values and Professional Ethics” while the mission is “To be a Referral Hub for Engineering Education and Sustainable Solutions Based on Islamic Principles for a Better World”.

Kulliyyah of Engineering strives to provide quality engineering education, which encompasses fundamental and specialized knowledge; and practice in engineering as well as a broad base knowledge in management, ethics, and humanities. Through this interdisciplinary approach, the graduates are nurtured towards being well-rounded individuals who are professionally qualified and competent as well as having sound moral, spiritual, intellectual, and ethical characteristics; ready to serve the current and emerging needs of the society.

Kulliyyah of Engineering also forges close partnership with the industry and government, as well as reaches out and contributes to both the IIUM community and the public at large with its services. The Kulliyyah also focuses its efforts to foster research in various fields of engineering towards the development of the nation and *ummah*.

The Kulliyyah has seven departments which are:



Department of Biotechnology Engineering



Department of Civil Engineering



Department of Electrical and Computer Engineering



Department of Manufacturing and Materials Engineering



Department of Mechanical Engineering



Department of Mechatronics Engineering



Department of Science in Engineering

Facilities

Aerodynamic Lab	Intelligent Research Lab
Aircraft Structure Lab	Intelligent System Lab
Analog Communication Lab	Kinetic Lab
Analytical Bioinstrumentation Lab	Machine Vision Lab
Antennas, Radar & Propagation Lab	Manufacturing Lab
Applied Mechanic Lab	Material Testing Lab
Autoclave Room	Mechatronic Research Lab
Automotive Instrumentation Lab	Mechatronic System Design
Automotive Workshop	Mechatronic Workshop and PCB
Autonomous System Lab	Laboratory
Avionic Lab	Metallography Lab
Biochemical Operation Lab	Metrology Lab
Biocomputational & Biomodelling Lab	Microbiology Lab
Biomaterial Lab	Microelectronics Lab
Bioprocess and Molecular Engineering	Microprocessor Lab
Research Unit Lab	Microwave Electronic Lab
Bioprocess Engineering (Pilot Plant)	Mobile Communication Lab
Bioprocess Utilities Lab	Molecular Biology and Genetic
CAD Lab	Engineering Lab
Cell and Tissue Engineering Lab	Multimedia Lab
Ceramic Lab	NDT Lab
Characterization Lab	Network & Communication Lab
Chemistry Lab	One Stop Centre
CNC Lathe Lab	Optical Lab
CNC Milling Lab	Optoelectronic Lab
Communication Engineering Lab	Photovoltaic Lab
Communication Protocols Lab	Plant Biotechnology Lab
Composite Lab	Polymer Lab
Computer Aided Design Lab	Postgraduate & Research Development
Computer Lab	Lab
Computer Teaching Lab	Postgraduate Computing Lab
Concrete Lab	Preparation Room
Control System Lab	Production Lab
Corrosion Lab	Project Development Lab
Design System Lab	Propulsion Lab
Digital Communication Lab	RF Design Lab
Electrical & Electronic Circuit Lab	Robot Design Lab
Electro Mechanical System Lab	Sand Testing Lab
Electronic Instrumentation &	Satellite Communication Lab
Measurement Lab	Small Workshop for Engineering student
Electronic Material Lab	Smart Structures System & Control
Electronic System Lab	Research Lab
Energy Research Group Lab	Software Engineering Lab
Environmental Biotechnology Lab	Spacecraft Guidance Navigation And
Fluid Mechanic Lab	Control Lab
General Lab	Special Project Lab
General Purpose Computer Lab	Structural Vibration Dynamics Lab
General Structure Lab	Styling Lab
Heat Treatment Lab	Surface Engineering Lab

Heating Cooling Lab IIUM - MERIA Robotic and automation Centre (IMRAC) Industrial Automation Lab Industrial Engineering Lab Instrumentation Lab Integrated Design Project Lab Integrated Manufacturing Lab	Thermal Science Lab Tool & Die Lab Trilogy Lab Vehicle Electrical Lab VLSI Design Lab Wind tunnel
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POSTGRADUATE PROGRAMMES

- **Master of Science** by Coursework only/Coursework and Research /Research only
 - Automotive Engineering
 - Biotechnology Engineering
 - Communication Engineering
 - Computer and Information Engineering
 - Electronic Engineering
 - Manufacturing Engineering
 - Material Engineering
 - Mechatronics Engineering
 - Mechanical Engineering

- **PhD. (Engineering)** by Research Only
Offered by the following departments:
 - Department of Electrical and Computer Engineering
 - Department of Manufacturing and Materials Engineering
 - Department of Mechatronics Engineering
 - Department of Mechanical Engineering
 - Department of Biotechnology Engineering
 - Department of Civil Engineering

MASTER'S PROGRAMME

Kulliyah of Engineering offers three modes of Master's programme; Coursework only, Coursework and Research; and Research Only. The normal duration of study is two academic years with a maximum of three years (six semesters full time).

Note: NA (not applicable)

TYPE OF COURSES	HOURS		
	PROGRAM STRUCTURE (MODE)		
	COURSEWORK ONLY (W)	COURSEWORK AND RESEARCH (MIXED MODE) (C)	RESEARCH ONLY (T)
A. Core Course	15 credit hours	9 credit hours	0 credit hours
B. Elective by Specialization	9 credit hours	6 credit hours	NA
C. University Required Course	6 credit hours	6 credit hours	0 credit hours
D. Research Courses	12 credit hours	21 credit hours	42 credit hours
TOTAL	42 credit hours	42 credit hours	42 credit hours

MASTER OF SCIENCE IN AUTOMOTIVE ENGINEERING (MSAE)

A. CORE COURSES

Select 3 courses for Mixed Mode (C); select 5 courses by Coursework Only (W) Mode

No.	Course Code	Course Title	Credit Hours	Pre-Requisite
1.	MECH 6326	Automotive Integrated Design (C&W)	3	NA
2.	MECH 6320	Automotive Manufacturing Processes (C&W)	3	
3	MECH 6310	Advanced Internal Combustion Engines (C&W)	3	
4.	MECH 6311	Advanced Vehicle Structural Design and Analysis (C&W)	3	
5.	MECH 6316	Automotive Control Systems (C&W)	3	

B. ELECTIVE BY SPECIALIZATION

Select 2 courses for Mixed Mode (C); select 3 courses by Coursework Only (W) Mode

No.	Course Code	Course Title	Credit Hours	Pre-Requisite
<i>Structure</i>				
1	MECH 6311	Advanced Vehicle Structural Design and Analysis	3	
2	MECH 6312	Advanced Vehicle Dynamics	3	
3	MECH 6314	Advanced Materials for Automotive Applications	3	
4	MECH 6402	Advanced Vibration	3	

5	MECH 6319	Reliability Engineering for Automotive Applications	3	NA
6	MECH 6401	Finite Element Method	3	
7	MECH 6321	Special Topics in Automotive Engineering	3	
<i>Vehicle Electronics and System</i>				
1	MECH 6327	Electric and Hybrid Vehicles	3	NA
2	MECH 6328	Intelligent Vehicle System	3	
3	MECH 6318	Design of Automotive Transmission Systems	3	
4	MECH 6319	Reliability Engineering for Automotive Applications	3	
5	MECH 6316	Automotive Control Systems	3	
6	MECH 6321	Special Topics in Automotive Engineering	3	
<i>Thermofluid</i>				
1	MECH 6329	Biofuels and Combustion	3	NA
2	MECH 6313	Vehicle Aerodynamics	3	
3	MECH 6318	Design of Automotive Transmission Systems	3	
4	MECH 6319	Reliability Engineering for Automotive Applications	3	
5	MECH 6321	Special Topics in Automotive Engineering	3	

C. UNIVERSITY REQUIRED COURSE

No.	Course Code	Course Title	Hours	Pre-requisite
1	RKGS 6000	Values, Technology and Society (For C & W)	3	NA
2	RKGS 6001	Values, Technology and Society (For T)	0	
3	MECH 6950	Research Methodology and Seminar (For C & W)	3	
4	MECH 6951	Research Methodology and Seminar (For T)	0	

D. RESEARCH COURSES

No.	Course Code	Course Title	Hours	Pre-requisite
Coursework and Research (21 Hours)				
1	MECH 6994	Research Proposal	0	NA
2	MECH 6998	Dissertation	21	MECH 6994
Research only (42 hours)				
1	MECH 6994	Research Proposal	0	NA

2	MECH 6999	Thesis	42	MECH 6995
3	MECH 6995	Comprehensive Exam	0	MECH 6994
Coursework only (12 hours)				
1	MECH 6997	Project Paper	12	NA

Note: NA (not applicable)

MASTER OF SCIENCE IN BIOTECHNOLOGY ENGINEERING (MSBTE)

A. CORE COURSES

Select 4 courses for Mixed Mode (C); select 6 courses by Coursework Only (W) Mode (include BTEN 6951/6950)

No.	Course Code	Course Title	Hours	Pre-Requisite
1	BTEN 6950	Research Methodology and Seminar (For C &W)	3	NA
	BTEN 6951	Research Methodology and Seminar (For T)	0	
2	BTEN 6203	Advanced Biochemical Process (C &W)	3	
3	BTEN 6204	Advanced Bioseparation Processes (C&W)	3	
4	BTEN 6309	Biofuel and Bioenergy (C&W)	3	
5	BTEN 6105	Food Biotechnology (W)	3	
6	BTEN 6305	Toxic and Hazardous Waste Management (W)	3	

B. ELECTIVE BY SPECIALIZATION

Select 2 courses for Mixed Mode (C); select 3 courses by Coursework Only (W) Mode

No.	Course Code	Course Title	Hours	Pre-Requisite
<i>Industrial Biotechnology Engineering</i>				
1	BTEN 6101	Biocatalyst and Enzyme Technology	3	
2	BTEN 6102	Genome and Functional Genomics	3	

3	BTEN 6103	Protein Design and Engineering	3	NA
4	BTEN 6104	Animal Cell Culture Engineering	3	
5	BTEN 6105	Food Biotechnology	3	
6	BTEN 6106	Natural Products, Nutraceuticals and Functional Foods	3	
7	BTEN 6107	Food Quality Assessment and Control	3	
8	BTEN 6108	Biosensor	3	
9	BTEN 6109	Advanced Plant Cell Tissue Culture	3	
<i>Bioprocess/ Biocatalyst Engineering</i>				
1	BTEN 6201	Advanced Bioprocess Control	3	NA
2	BTEN 6202	Advanced Metabolic Engineering	3	
3	BTEN 6203	Advanced Biochemical Process	3	
4	BTEN 6204	Advanced Bioseparation Process	3	
<i>Bioenvironmental Engineering</i>				
1	BTEN 6301	Environmental Engineering Management	3	NA
2	BTEN 6302	Advanced Solid Waste Management	3	
3	BTEN 6303	Advanced Biological Waste Water Treatment Plant Design	3	
4	BTEN 6304	Advanced Air Pollution Control Technology	3	
5	BTEN 6305	Toxic and Hazardous Waste Management	3	
6	BTEN 6306	Waste water Reclamation and Reuse	3	
7	BTEN 6307	Advanced Water Treatment Process	3	
8	BTEN 6308	Biodegradation and Biotransformation	3	
9	BTEN 6309	Biofuel and Bioenergy	3	
1	BTEN 6401	Bioinformatics	3	
2	BTEN 6402	Modeling of Biological Systems	3	
3	BTEN 6403	Advanced Biological Reactor Design and Analysis	3	
4	BTEN 6404	Special Topics in Advanced Biotechnology Engineering	3	
5	BTEN 6405	Advanced Transport Phenomena	3	
6	BTEN 6406	System Biology	3	
7	BTEN 6407	Nanobiotechnology	3	

C.UNIVERSITY REQUIRED COURSE

No.	Course Code	Course Title	Hours	Pre-
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				requisite
1	RKGS 6000	Values, Technology and Society (For W & C)	3	NA
2	RKGS 6001	Values, Technology and Society(For T)	0	

D. RESEARCH COURSES

No.	Course Code	Course Title	Hours	Pre-requisite
Coursework and Research (21 Hours)				
1	BTEN 6994	Research Proposal	0	NA
2	BTEN 6998	Dissertation	21	BTEN 6994
Research only (42 hours)				
1	BTEN 6994	Research Proposal	0	NA
2	BTEN 6999	Thesis	42	BTEN 6995
3	BTEN 6995	Comprehensive Exam	0	BTEN 6994
Coursework only (12 Hours)				
1	BTEN 6997	Project Paper	12	NA

MASTER OF SCIENCE IN COMMUNICATION ENGINEERING (MSCE)

A. CORE COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
1	EECE 6201	Digital Communications (C&W)	3	NA
2	EECE 6202	Information Theory and Coding (C&W)	3	
3	EECE 6203	Wireless Communication Systems. (C&W)	3	
4	EECE 6211	Optical Communications (W)	3	
5	EECE 6212	RF Design and Microwave Systems. (W)	3	

B. ELECTIVE COURSES

Select 2 courses for Mixed Mode (C); select 3 courses by Coursework Only (W) Mode

No	Course Code	Course Title	Credit Hours	Pre-requisite
1	EECE 6111	Performance Modeling of Computer Systems	3	NA
2	EECE 6112	Computer Network security	3	
3	EECE 6121	Advanced topics in software engineering	3	
4	EECE 6122	Distributed Multimedia System	3	
5	EECE 6123	Computer vision and image processing	3	
6	EECE 6201	Digital Communications	3	
7	EECE 6202	Information Theory and Coding	3	
8	EECE 6203	Wireless Communication Systems	3	
9	EECE 6211	Optical Communications	3	
10	EECE 6212	RF Design and Microwave Systems	3	

11	EECE 6221	Adaptive Signal Processing	3	NA
12	EECE 6222	Image Processing	3	
13	EECE 6223	Antenna Engineering	3	
14	EECE 6224	Mobile Communications	3	
15	EECE 6225	Satellite Communications	3	
16	EECE 6226	Radar Systems and Remote Sensing	3	
17	EECE 6227	Speech and Audio Processing	3	
18	EECE 6271	Selected Topics in Communication Eng.	3	
19	EECE 6301	Circuits, Signals and Filters	3	
20	EECE 6302	Digital System Design	3	
21	EECE 6303	Semiconductor Devices	3	
22	EECE 6311	Electronic Instrumentation	3	
23	EECE 6312	Integrated Circuit Technology	3	
24	EECE 6321	Electro-Optics	3	
25	EECE 6322	Industrial Electronics	3	
26	EECE 6323	Biomedical Electronic and Systems	3	
27	EECE 6324	Advanced Topics in VLSI Design	3	
28	EECE 6325	Analog Circuit Design	3	
29	EECE 6326	Quantum Electronics	3	
30	EECE 6327	Microelectromechanical Sensors, Actuators and Systems	3	
31	EECE 6371	Selected Topics in Electronic Eng.	3	

C. UNIVERSITY REQUIRED COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research & Coursework Only				
1	RKGS 6000	Values, Technology and Society	3	NA
2	EECE 6950	Research Methodology & Seminar	3	
Research Only				
1	RKGS 6001	Values, Technology and Society	0	NA
2	EECE 6951	Research Methodology & Seminar	0	

D. RESEARCH COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research (21 Credit Hours)				
1	EECE 6994	Research Proposal	0	NA
2	EECE 6998	Dissertation	21	EECE 6994
Research only (42 credit hours)				
1	EECE 6994	Research Proposal	0	NA
2	EECE 6999	Thesis	42	EECE 6995
3	EECE 6995	Comprehensive Exam	0	EECE 6994
Coursework only (12 credit hours)				
1	EECE 6997	Project Paper	12	NA

Note: NA (not applicable)

MASTER OF SCIENCE IN COMPUTER INFORMATION ENGINEERING (MSCIE)

A. CORE COURSES

No	Course Code	Course Title	Credit Hours	Pre-requisite
1	EECE 6101	Embedded System Design (C&W)	3	NA
2	EECE 6102	Advanced Operating Systems (C&W)	3	
3	EECE 6103	Advanced Computer Communication Networks (C&W)	3	
4	EECE 6111	Performance Analysis of Computer Systems. (W)	3	
5	EECE 6112	Computer Network Security (W)	3	

B. ELECTIVE COURSES

Select 2 courses for Mixed Mode (C); select 3 courses by Coursework Only (W) Mode

No.	Course Code	Course Title	Credit Hours	Pre-requisite
1	EECE 6111	Performance Modelling of Computer Systems	3	NA
2	EECE 6112	Computer Network security	3	
3	EECE 6121	Advanced topics in software engineering	3	
4	EECE 6122	Distributed Multimedia System	3	
5	EECE 6123	Computer vision and image processing	3	
6	EECE 6124	Real-time computing systems	3	
7	EECE 6125	Advanced computer architecture	3	
8	EECE 6126	Human computer interaction	3	
9	EECE 6127	Neural Networks and Systems	3	
10	EECE 6128	Fault tolerant computing	3	
11	EECE 6171	Selected topics in Computer and Information Eng.	3	
12	EECE 6201	Digital Communications	3	
13	EECE 6202	Information Theory and Coding	3	
14	EECE 6203	Wireless Communication Systems	3	
15	EECE 6211	Optical Communications	3	
16	EECE 6212	RF Design and Microwave Systems	3	
17	EECE 6221	Adaptive Signal Processing	3	
18	EECE 6222	Image Processing	3	
19	EECE 6223	Antenna Engineering	3	
20	EECE 6224	Mobile Communications	3	
21	EECE 6225	Satellite Communications	3	
22	EECE 6226	Radar Systems and Remote Sensing	3	
23	EECE 6227	Speech and Audio Processing	3	
24	EECE 6171	Selected Topics in Communication Engineering	3	
25	EECE 6301	Circuits, Signals and Filters	3	
26	EECE 6302	Digital System Design	3	
27	EECE 6303	Semiconductor Devices	3	
28	EECE 6311	Electronic Instrumentation	3	
29	EECE 6312	Integrated Circuit Technology	3	

30	EECE 6321	Electro-Optics	3	
31	EECE 6322	Industrial Electronics	3	
32	EECE 6323	Biomedical Electronic and Systems	3	
33	EECE 6324	Advanced Topics in VLSI Design	3	
34	EECE 6325	Analog Circuit Design	3	
35	EECE 6326	Quantum Electronics	3	
36	EECE 6327	Microelectromechanical Sensors, Actuators and Systems	3	
37	EECE 6371	Selected Topics in Electronic Engineering	3	

C. UNIVERSITY REQUIRED COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research & Coursework Only				
1	RKGS 6000	Values, Technology and Society	3	NA
2	EECE 6950	Research Methodology & Seminar	3	
Research Only				
1	RKGS 6001	Values, Technology and Society	0	NA
2	EECE 6951	Research Methodology & Seminar	0	

D. RESEARCH COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research (21 Credit Hours)				
1	EECE 6994	Research Proposal	0	NA
2	EECE 6998	Dissertation	21	EECE 6994
Research only (42 credit hours)				
1	EECE 6994	Research Proposal	0	NA
2	EECE 6999	Thesis	42	EECE 6995
3	EECE 6995	Comprehensive Exam	0	EECE 6994
Coursework only (12 credit hour)				
1	EECE 6997	Project Paper	12	NA

Note: NA (not applicable)

MASTER OF SCIENCE IN ELECTRONIC ENGINEERING (MSEE)

A. CORE COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
1	EECE 6301	Circuits, Signals and Filters (C&W)	3	NA
2	EECE 6302	Digital System Design (C&W)	3	
3	EECE 6303	Semiconductor Devices.(C&W)	3	
4	EECE 6311	Electronic Instrumentation (W)	3	
5	EECE 6312	Integrated Circuit Technology.(W)	3	

B. ELECTIVE COURSES**Select 2 courses for Mixed Mode (C); select 3 courses by Coursework Only (W) Mode**

No.	Course Code	Course Title	Credit Hours	Pre-requisite
1	EECE6311	Electronic Instrumentation	3	NA
2	EECE6312	Integrated Circuit Technology.	3	
3	EECE 6111	Performance Modelling of Computer Systems	3	
4	EECE 6112	Computer Network security	3	
5	EECE 6121	Advanced topics in software engineering	3	
6	EECE 6122	Distributed Multimedia System	3	
7	EECE 6123	Computer vision and image processing	3	
8	EECE 6124	Real-time computing systems	3	
9	EECE 6125	Advanced computer architecture	3	
10	EECE 6126	Human computer interaction	3	
11	EECE 6127	Neural Networks and Systems	3	
12	EECE 6128	Fault tolerant computing	3	
13	EECE 6171	Selected topics in Computer and Information Eng.	3	
14	EECE 6201	Digital Communications	3	
15	EECE 6202	Information Theory and Coding	3	
16	EECE 6203	Wireless Communication Systems	3	
17	EECE 6211	Optical Communications	3	
18	EECE 6212	RF Design and Microwave Systems	3	
19	EECE 6221	Adaptive Signal Processing	3	
20	EECE 6222	Image Processing	3	
21	EECE 6223	Antenna Engineering	3	
22	EECE 6224	Mobile Communications	3	
23	EECE 6225	Satellite Communications	3	
24	EECE 6226	Radar Systems and Remote Sensing	3	
25	EECE 6227	Speech and Audio Processing	3	
26	EECE 6271	Selected Topics in Communication Eng.	3	
27	EECE 6301	Circuits, Signals and Filters	3	
28	EECE 6302	Digital System Design	3	
29	EECE 6303	Semiconductor Devices	3	
30	EECE 6311	Electronic Instrumentation	3	
31	EECE 6312	Integrated Circuit Technology	3	
32	EECE 6321	Electro-Optics	3	
33	EECE 6322	Industrial Electronics	3	
34	EECE 6323	Biomedical Electronic and Systems	3	
35	EECE 6324	Advanced Topics in VLSI Design	3	
36	EECE 6325	Analog Circuit Design	3	
37	EECE 6326	Quantum Electronics	3	
38	EECE 6327	Microelectromechanical Sensors, Actuators and Systems	3	
39	EECE 6371	Selected Topics in Electronic Engineering	3	

C. UNIVERSITY REQUIRED COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research & Coursework Only				
1	RKGS 6000	Values, Technology and Society	3	NA
2	EECE 6950	Research Methodology & Seminar	3	
Research Only				
1	RKGS 6001	Values, Technology and Society	0	NA
2	EECE 6951	Research Methodology & Seminar	0	

D. RESEARCH COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research (21 Credit Hours)				
1	EECE 6994	Research Proposal	0	NA
2	EECE 6998	Dissertation	21	EECE 6994
Research only (42 credit hours)				
1	EECE 6994	Research Proposal	0	NA
2	EECE 6999	Thesis	42	EECE 6995
3	EECE 6995	Comprehensive Exam	0	EECE 6994
Coursework only Mode (12 credit hours)				
1	EECE 6997	Project Paper	12	NA

Note: NA (not applicable)

MASTER OF SCIENCE IN MANUFACTURING ENGINEERING (MSMFG)

A. CORE COURSES

No.	Course Code	Course Title	Credit Hours	Pre-requisite
1	MANU 6002	Bulk Deformation and Net Shape Manufacturing	3	NA
2	MANU 6003	Production System Analysis	3	
3.	MANU 6004	Design for Manufacturing	3	

B. ELECTIVE BY SPECIALIZATION

Select 2 courses for Mixed Mode, Select 5 courses by Course Mode

No.	Course Code	Course Title	Credit Hours	Pre-requisite
Manufacturing Technology				
1	MANU 6011	Advanced Machining Processes	3	NA
2	MANU 6012	Advanced Metal Cutting	3	
3	MANU 6013	Micro-Meso-Manufacturing	3	

4	MANU 6014	Precision Manufacturing	3	
5	MANU 6015	Advanced Computer Aided Manufacturing	3	
6	MANU 6016	Manufacturing Automation and Robotics	3	
7	MANU 6017	Computer Integrated Manufacturing System	3	
Manufacturing System				
1	MANU 6041	Engineering Cost Analysis	3	NA
2	MANU 6042	Engineering Project Management	3	
3	MANU 6043	Quality Systems and Management	3	
4	MANU 6044	Strategic Management for Manufacturing	3	
5	MANU 6045	Production Scheduling and Sequencing	3	
6	MANU 6046	Human Factor Engineering	3	
7	MANU 6047	Supply Chain Management	3	

C. UNIVERSITY REQUIRED COURSE

No	Course Code	Course Title	Credit Hours	Pre-requisite
1	RKGS 6000	Values, Technology and Society (For W&C)	3	NA
2	RKGS 6001	Values, Technology and Society (For T)	0	
3	MANU 6950	Research Methodology and Seminar (For W&C)	3	
4	MANU 6951	Research Methodology and Seminar (For T)	0	

D. RESEARCH COURSES

No	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research (21 Credit Hours)				
1	MANU 6994	Research Proposal	0	NA
2	MANU 6998	Dissertation	21	MANU 6994
Research only (42 credit hours)				
1	MANU 6994	Research Proposal	0	NA
2	MANU 6999	Thesis	42	MANU 6995
3	MANU 6995	Comprehensive Exam	0	MANU6994
Course Mode (12 Credit Hours)				
1	MANU 6997	Project Paper	12	NA

Note: NA (not applicable)

MASTER OF SCIENCE IN MATERIAL ENGINEERING (MSMAT)

A. CORE COURSES

No	Course Code	Course Title	Credit Hours	Pre-Requisite
1	MATR 6002	Advanced Materials Characterizations	3	NA
2	MATR 6003	Contemporary Materials for Engineering Applications	3	
3	MATR 6004	Advanced Metallic Materials	3	

B. ELECTIVE BY SPECIALIZATION

Select 2 courses for Mixed Mode, Select 5 courses by Course Mode

No	Course Code	Course Title	Credit Hours	Pre-Requisite
<i>Modern Materials and Processing</i>				
1	MATR 6011	Advanced Composite Materials	3	NA
2	MATR 6012	Corrosion Processes and Protection	3	
3	MATR 6013	Biocomposites	3	
4	MATR 6014	Advanced Photovoltaic Materials and Solar Cells	3	
5	MATR 6015	Modern Welding Technology	3	
6	MATR 6016	Modelling and Computer Simulation of IC Manufacturing Processes	3	
7	MATR 6017	Advanced Polymer Synthesis and Processing	3	
<i>Characterization of Materials</i>				
1	MATR 6041	Thin Films	3	NA
2	MATR 6042	Nondestructive Testing of Materials	3	
3	MATR 6043	Bioceramics	3	
4	MATR 6044	Advanced Ceramics	3	
5	MATR 6045	High-Performance Polymeric Materials	3	
6	MATR 6046	Surface Engineering for Tribological Applications	3	
7	MATR 6047	Microstructural Control	3	
8	MATR 6048	Advanced Thermodynamics of Materials	3	

C. UNIVERSITY REQUIRED COURSE

No	Course Code	Course Title	Credit Hours	Pre-requisite
1	RKGS 6000	Values, Technology and Society (For W &C)	3	

2	RKGS 6001	Values, Technology and Society (For T)	0	NA
3	MATR 6950	Research Methodology and Seminar (For W&C)	3	
4	MATR 6951	Research Methodology and Seminar (For T)	0	

D. RESEARCH COURSES

No	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research (21 Credit Hours)				
1	MATR 6994	Research Proposal	0	NA
2	MATR 6998	Dissertation	21	MATR 6994
Research only (42 credit hours)				
1	MATR 6994	Research Proposal	0	NA
2	MATR 6999	Thesis	42	MATR 6995
3	MATR 6995	Comprehensive Exam	0	MATR 6994
Course Mode (12 Credit Hours)				
1	MATR 6997	Project Paper	12	NA

Note: NA (not applicable)

MASTER OF SCIENCE IN MECHATRONICS ENGINEERING (MSMCT)

A. CORE COURSES

No	Course Code	Course Title	Credit Hours	Pre-Requisite
1	MCTE 6102	Mechatronics System Design	3	NA
2	MCTE 6222	System Dynamics and Control	3	
3	MCTE 6212	Advanced Instrumentation and Measurement	3	

B. ELECTIVE BY SPECIALIZATION

Select 2 courses for Mixed Mode, Select 5 courses by Course Mode

No	Course Code	Course Title	Credit Hours	Pre-requisite
<i>Instrumentation and Control</i>				
1	MCTE 6101	Modeling and Simulation	3	NA
2	MCTE 6104	Advanced Control System	3	
3	MCTE 6108	Intelligent Machines	3	
4	MCTE 6110	Digital Control System Design	3	
5	MCTE 6211	Industrial Sensing Systems	3	
6	MCTE 6213	Advanced Digital Signal Processing	3	
7	MCTE 6214	Nonlinear and Adaptive Control	3	
8	MCTE 6555	Advanced Topics in Mechatronics	3	

Robotics and Automation				
1	MCTE 6103	Microprocessors in Mechanical Systems	3	NA
2	MCTE 6107	Mechanical Vibration	3	
3	MCTE 6109	Advanced Topics in Robotics	3	
4	MCTE 6210	Power Electronics Systems and Design	3	
5	MCTE 6106	Machine Vision	3	
6	MCTE 6112	Active Control of Vibration	3	
7	MCTE 6311	Autonomous Agent Systems	3	
8	MCTE 6555	Advanced Topics in Mechatronics	3	

C. UNIVERSITY REQUIRED COURSE

No	Course Code	Course Title	Credit Hours	Pre-requisite
1	RKGS 6000	Values, Technology and Society (For W &C)	3	NA
2	RKGS 6001	Values, Technology and Society (For T)	0	
3	MCTE 6950	Research Methodology and Seminar (For W &C)	3	
4	MCTE 6951	Research Methodology and Seminar (For T)	0	

D. RESEARCH COURSES

No	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research (21 Credit Hours)				
1	MCTE 6994	Research Proposal	0	NA
2	MCTE 6998	Dissertation	21	MCTE 6994
Research only (42 credit hours)				
1	MCTE 6994	Research Proposal	0	NA
2	MCTE 6999	Thesis	42	MCTE 6995
3	MCTE 6995	Comprehensive Exam	0	MCTE 6994
Course Mode (12 Credit Hours)				
1	MCTE 6997	Project Paper	12	NA

Note: NA (not applicable)

MASTER OF SCIENCE IN MECHANICAL ENGINEERING (MSME)

A. CORE COURSES

Select 3 courses for Mixed Mode, Select 5 courses by Course Mode

No	Course Code	Course Title	Credit Hours	Pre-Requisite
1	MECH 6561	Advanced Fluid Dynamics (C &W)	3	

2	MECH 6521	Structural Analysis (C&W)	3	NA
3	MECH 6525	Heat and Mass Transfer (C&W)	3	
4	MECH 6539	Applied Engineering Mathematics (W)	3	
5	MECH 6401	Applied Finite Element Methods (W)	3	

B. ELECTIVE BY SPECIALIZATION

Select 2 courses for Mixed Mode, Select 3 courses by Course Mode

No	Course Code	Course Title	Credit Hours	Pre-Requisite
Structure				
1	MECH 6501	Smart Structures	3	NA
2	MECH 6503	Composites Structures	3	
3	MECH 6527	Biomechanics	3	
4	MECH 6529	Applied Elasticity	3	
5	MECH 6531	Applied Plasticity	3	
6	MECH 6505	Micro-Electromechanical System (MEMS)	3	
7	MECH 6507	Nanotechnology	3	
8	MECH 6402	Advanced Vibration	3	
9	MECH 6401	Applied Finite Element Methods	3	
10	MECH 6539	Applied Engineering Mathematics	3	
11	MECH 6533	Special Topics in Mechanical Engineering	3	
Aerospace				
1	MECH 6503	Composites Structures	3	NA
2	MECH 6523	Experimental Fluid Dynamics	3	
3	MECH 6513	Modern Control Systems	3	
4	MECH 6517	Combustion	3	
5	MECH 6519	Propulsion Systems	3	
6	MECH 6511	Computational Fluid Dynamics	3	
7	MECH 6401	Applied Finite Element Methods	3	
8	MECH 6539	Applied Engineering Mathematics	3	
9	MECH 6533	Special Topics in Mechanical Engineering	3	
Thermofluid and Renewable Energy				
1	MECH 6523	Experimental Fluid Dynamics	3	
2	MECH 6517	Combustion	3	
3	MECH 6511	Computational Fluid Dynamics	3	

4	MECH 6509	Renewable Energy	3	NA
5	MECH 6510	Solar Energy System	3	
6	MECH 6537	Two Phase Flow and Heat Transfer	3	
7	MECH 6539	Applied Engineering Mathematics	3	
8	MECH 6533	Special Topics in Mechanical Engineering	3	

C. UNIVERSITY REQUIRED COURSE

No	Course Code	Course Title	Credit Hours	Pre-requisite
1	RKGS 6000	Values, Technology and Society (For W& C)	3	NA
2	RKGS 6001	Values, Technology and Society (For T)	0	
3	MECH 6950	Research Methodology and Seminar (For W &C)	3	
4	MECH 6951	Research Methodology and Seminar (For W &C)	0	

D. RESEARCH COURSES

No	Course Code	Course Title	Credit Hours	Pre-requisite
Coursework and Research (21 Credit Hours)				
1	MECH 6994	Research Proposal	0	NA
2	MECH 6998	Dissertation	21	MECH 6994
Research only (42 credit hours)				
1	MECH 6994	Research Proposal	0	NA
2	MECH 6999	Thesis	42	MECH 6995
3	MECH 6995	Comprehensive Exam	0	MECH 6994
Course Mode (12 Credit Hours)				
1	MECH 6997	Project Paper	12	NA

Note: NA (not applicable)

Ph.D. (ENGINEERING) by Research only

The doctorate programme offered by the Kulliyah of Engineering is by research only. The minimum study period for the degree is two years with normal duration of three years (six semesters full-time). A student must perform an independent investigation in the form of a thesis. Upon admission to and enrollment in the Kulliyah of Engineering, all Ph.D. students are eligible to select their research topics and supervisors. Six months after registration, students need to sit for the Comprehensive Examination to defend the research proposal. After passing the Comprehensive Examination, student registers for thesis and continue his/her research work. However, students need to complete all pre-requisite courses (if any as specified by the department) before registering for Comprehensive Examination. Other graduation requirements for the PhD programmes are (i) Research Methodology and Seminar, and (ii) RKGS 7000 Values, Technology and Society. In both courses, students must show satisfactory performance.

