FACULTY OF ENGINEERING

Undergraduate programme offered:

Bachelor Programme

1. *Bachelor of Aerospace Engineering*
2. *Bachelor of Civil Engineering*
3. *Bachelor of Agricultural and Biosystems Engineering*
4. *Bachelor of Electrical and Electronic Engineering*
5. *Bachelor of Chemical Engineering*
6. *Bachelor of Computer and Communication Systems Engineering*
7. *Bachelor of Mechanical Engineering*
8. *Bachelor of Process and Food Engineering*

STUDY SCHEME (BACHELOR OF AEROSPACE ENGINEERING)

Notes : L = Lecture , L/T = Tutorial

SEMESTER 1 | ***SEMESTER 2***

1ST YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC3011	*Engineering Mathematics I*	*3*	*0*
EMM3103	*Statics*	*3*	*0*
EAS3411	*Aerospace Materials and Processes*	*2*	*0*
EMM3518	*Computer Aided Engineering Drawing*	*1*	*2*
EAS3623	*Aerospace Electrical and Electronics*	*2*	*1*
PRT2008	*Agriculture and Man*	*2*	*0*
SKP2203	*Islamic Civilization and Asian Civilization*	*2*	*0*
	TOTAL	***15***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
ECC3012	*Engineering Mathematics II*	*3*	*0*
ECC3005	*Computer Programming*	*2*	*1*
EMM3105	*Dynamics*	*3*	*0*
EMM3305	*Fluid Mechanics I*	*3*	*0*
EAS3622	*Avionics*	*2*	*0*
BBI2423	*Academic Interaction and Presentation*	*2*	*1*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***15***	***3***

2ND YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EMM3409	*Strength of Materials I*	*3*	*0*
EAS3521	*Aerothermodynamics*	*3*	*0*
EAS3322	*Vibration*	*3*	*0*
EAS3212	*Aerodynamics I*	*3*	*0*
EAS3931	*Aerospace Laboratory I*	*0*	*1*
BBI2424	*Academic Writing*	*2*	*1*
*QK******	*Kokurikulum/ Co-curriculum*	*0*	*1*
	JUMLAH/ TOTAL	***14***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
EAS3122	*Numerical Analysis for Engineering Applications*	*2*	*0*
EAS3214	*Aerodynamics II*	*3*	*0*
EAS3513	*Propulsion*	*3*	*0*
EAS3811	*Space Mechanics*	*3*	*0*
EAS3932	*Aerospace Laboratory II*	*0*	*1*
SKP2204	*Ethnic Relation*	*2*	*0*
SKP2101	*Malaysian Nationhood*	*3*	*0*
	TOTAL	***16***	***1***

3RD YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC3014	*Engineering Statistics*	*3*	*0*
EAS3215	*Flight Mechanics*	*3*	*0*
EAS3313	*Control Systems*	*3*	*0*
EAS3434	*Aerospace Structures I*	*3*	*0*
EAS3812	*Satellite Technology*	*3*	*0*
EAS3123	*Management of Aerospace and Agriculture Industry*	*2*	*0*
	TOTAL	***17***	***0***

CODE	*COURSE NAME*	*L*	*L/T*
ECV3011	*Engineers and Society*	*2*	*1*
EAS3314	*Aircraft Stability and Control*	*3*	*0*
EAS3435	*Aerospace Structures II*	*3*	*0*
EAS3514	*Space Launch Technology*	*3*	*0*
EAS3723	*Fixed Wing Aircraft Design*	*3*	*0*
EAS3933	*Aerospace Laboratory III*	*0*	*1*
	TOTAL	***14***	***2***

4TH YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EAS4911	*Industrial Training*	*0*	*5*
EAS4949A	*Bachelor's Project*	*0*	*2*
EAS4947	*Aerospace Design Project*	*0*	*4*
*EAS*****	*Elective I*	*3*	*0*
*EAS*****	*Elective II*	*3*	*0*
	TOTAL	***6***	***11***

CODE	*COURSE NAME*	*L*	*L/T*
EAS4949B	*Bachelor's Project*	*0*	*4*
*EAS4****	*Elective III*	*3*	*0*
*EAS4****	*Elective IV*	*3*	*0*
*EAS4****	*Elective V*	*3*	*0*
	TOTAL	***9***	***4***

STUDY SCHEME (BACHELOR OF CIVIL ENGINEERING)

Notes : L = Lecture , L/T = Laboratory/Tutorial

SEMESTER 1

1ST YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECV3111	*Engineering Mechanics*	*3*	*0*
ECV3112	*Civil Engineering Materials*	*2*	*1*
ECV3511	*Geomatics Engineering*	*2*	*1*
ECC3011	*Engineering Mathematics I*	*3*	*0*
SKP2203	*Islamic Civilization and Asian Civilization*	*2*	*0*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***12***	***3***

SEMESTER 2

1ST YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECV3211	*Mechanics of Materials*	*3*	*0*
ECV3311	*Engineering Geology*	*2*	*1*
EMM3518	*Computer Aided Engineering Drawing*	*1*	*2*
ECC3012	*Engineering Mathematics II*	*3*	*0*
BBI2423	*Academic Interaction and Presentation*	*2*	*1*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***11***	***5***

2ND YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECV3212	*Structural Analysis I*	*2*	*1*
ECV3312	*Soil Mechanics I*	*3*	*0*
ECV3411	*Hydraulics I*	*3*	*0*
ECC3005	*Computer Programming*	*2*	*1*
SKP2101	*Malaysian Nationhood*	*3*	*0*
BBI2424	*Academic Writing*	*2*	*1*
	TOTAL	***15***	***3***

2ND YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECV3113	*Integrated Project*	*0*	*1*
ECV3213	*Structural Analysis II*	*3*	*0*
ECV3313	*Soil Mechanics II*	*2*	*1*
ECV3412	*Hydraulics II*	*2*	*1*
ECC3014	*Engineering Statistics*	*3*	*0*
SKP2204	*Ethnic Relation*	*2*	*0*
PRT2008	*Agriculture and Man*	*2*	*0*
	TOTAL	***14***	***3***

3RD YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECV3214	*Reinforced Concrete Structure Design*	*3*	*0*
ECV3413	*Environmental Engineering*	*3*	*1*
ECV3611	*Transportation Engineering*	*3*	*0*
ECV3612	*Traffic Engineering*	*2*	*1*
ECV3711	*Construction Quantity Measurement*	*3*	*0*
	TOTAL	***14***	***2***

3RD YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECV3011	*Engineers and Society*	*2*	*1*
ECV3215	*Design of Steel and Timber Structure*	*3*	*0*
ECV3314	*Foundation Engineering*	*3*	*0*
ECV3414	*Engineering Hydrology*	*3*	*0*
ECV3613	*Highway Engineering II*	*2*	*1*
ECV3712	*Project Management*	*3*	*0*
	TOTAL	*16*	*2*

4TH YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECV3713	*Building Information Modelling for Engineers*	*2*	*1*
ECV4311	*Design of Foundation*	*3*	*0*
ECV4947	*Civil Engineering Design Project*	*0*	*4*
ECV4911	*Industrial Training*	*0*	*5*
ECV4949A	*Bachelor's Project*	*0*	*2*
*ECV*****	*Elective I*	*3*	*0*
	TOTAL	***8***	***12***

4TH YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECV4949B	*Bachelor's Project*	*0*	*4*
*ECV4****	*Elective II*	*3*	*0*
*ECV4****	*Elective III*	*3*	*0*
*ECV4****	*Elective IV*	*3*	*0*
*ECV4****	*Elective V*	*3*	*0*
	TOTAL	***12***	***4***

STUDY SCHEME (BACHELOR OF AGRICULTURAL AND BIOSYSTEMS ENGINEERING)

Notes : L = Lecture , L/T = Laboratory/Tutorial

SEMESTER 1

1ST YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC3011	*Engineering Mathematics I*	*3*	*0*
ECC3005	*Computer Programming*	*2*	*1*
EMM3518	*Computer Aided Engineering Drawing*	*1*	*2*
EMM3103	*Statics*	*3*	*0*
PRT2008	*Agriculture and Man*	*2*	*0*
SKP2204	*Ethnic Relations*	*2*	*0*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***13***	***4***

2ND YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EEE3020	*Electrical and Electronic Technology*	*2*	*1*
EMM3305	*Fluid Mechanics I*	*3*	*0*
EMM3409	*Strength of Materials I*	*3*	*0*
EAB3216	*Biosystems Environment*	*3*	*0*
EAB3312	*Soil Engineering*	*2*	*1*
BBI2424	*Academic Writing*	*2*	*1*
	TOTAL	***15***	***3***

3RD YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EAB3210	*Principles of Heat Transfer*	*3*	*0*
EAB3304	*Hydraulics*	*2*	*1*
EAB3518	*Machine Design*	*2*	*1*
EAB3614	*Control System Engineering*	*3*	*0*
ECV3511	*Geomatics Engineering*	*2*	*1*
EAB3214	*Geographic Information System Technology*	*3*	*0*
	TOTAL	***15***	***3***

4TH YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EAB4911	*Industrial Training*	*0*	*5*
EAB4949A	*Bachelor's Project*	*0*	*2*
EAB4947	*Agricultural and Biosystem Engineering Design Project*	*0*	*4*
EMM3610	*Engineering Economic Analysis*	*3*	*0*
*EAB4****	*Elective I*	*3*	*0*
	TOTAL	***6***	***11***

SEMESTER 2

CODE	*COURSE NAME*	*L*	*L/T*
ECC3012	*Engineering Mathematics II*	*3*	*0*
EMM3105	*Dynamics*	*3*	*0*
EMM3213	*Thermodynamics I*	*3*	*0*
EAB3001	*Workshop Management and Practice*	*0*	*1*
PRT3005	*Crop Production System*	*3*	*0*
BBI2423	*Academic Interaction and Presentation*	*2*	*1*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***14***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
ECC3014	*Engineering Statistics*	*3*	*0*
EAB3208	*Agricultural Waste Management*	*2*	*1*
EAB3303	*Hydrology*	*3*	*0*
EAB3514	*Thermal and Fluid Machines*	*2*	*1*
EAB3612	*Biological System Instrumentation*	*2*	*1*
SKP2103	*Islamic Civilization and Asian Civilization*	*2*	*0*
	TOTAL	***14***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
EAB3011	*Analysis and Design of Structures*	*3*	*0*
EAB3212	*Agricultural Process Engineering*	*2*	*1*
EAB3316	*Irrigation and Drainage Engineering*	*2*	*1*
EAB3516	*Plantation Machinery*	*2*	*1*
SKP2101	*Malaysian Nationhood*	*3*	*0*
	TOTAL	***12***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
EAB4949B	*Bachelor's Project*	*0*	*4*
EAB3014	*Engineering Properties of Agricultural Materials*	*3*	*0*
ECV3011	*Engineers and Society*	*2*	*1*
*EAB4****	*Elective II*	*3*	*0*
*EAB4****	*Elective III*	*3*	*0*
	TOTAL	***11***	***5***

STUDY SCHEME (BACHELOR OF ELECTRICAL AND ELECTRONIC ENGINEERING)

Notes : L = Lecture , L/T = Tutorial

SEMESTER 1 | ***SEMESTER 2***

1ST YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC3011	*Engineering Mathematics I*	*3*	*0*
EEE3121	*Electrical and Electronic Principles*	*3*	*0*
EEE3123	*Computer Programming*	*3*	*1*
SKP2204	*Ethnic Relation*	*2*	*0*
PRT2008	*Agriculture and Man*	*2*	*0*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***13***	***2***

CODE	*COURSE NAME*	*L*	*L/T*
ECC3012	*Engineering Mathematics II*	*3*	*0*
EEE3122	*Semiconductor Devices*	*3*	*0*
EEE3125	*Digital Circuits*	*3*	*0*
EEE3126	*Electric Circuits*	*3*	*0*
EEE3922	*Electrical and Electronics Laboratory I*	*0*	*1*
BBI2423	*Academic Interaction and Presentation*	*2*	*1*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***14***	***3***

2ND YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EEE3130	*Basic Electromagnetism*	*3*	*0*
EEE3127	*Analog Systems*	*3*	*1*
EEE3128	*Digital Systems*	*3*	*1*
BBI2424	*Academic Writing*	*2*	*1*
SKP2101	*Malaysian Nationhood*	*3*	*0*
	TOTAL	***14***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
EEE3124	*Instrumentations and Measurements*	*3*	*0*
EEE3131	*Advanced Electromagnetism*	*3*	*0*
EEE3132	*Microprocessor Technology*	*3*	*1*
EEE3421	*Control Systems*	*3*	*0*
SKP2203	*Islamic Civilization and Asian Civilization*	*2*	*0*
	TOTAL	***14***	***1***

3RD YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EEE3222	*Microelectronic Principles*	*3*	*0*
EEE3322	*Power Electronics*	*3*	*0*
EEE3323	*Electrical Machines and Drives*	*3*	*0*
EEE3422	*Industrial Control Electronics*	*3*	*0*
EEE3521	*Signal Processing*	*3*	*0*
EEE3924	*Electrical Power Engineering Laboratory*	*0*	*1*
EEE3925	*Control Engineering Laboratory I*	*0*	*1*
	TOTAL	***15***	***2***

CODE	*COURSE NAME*	*L*	*L/T*
EEE3324	*Power System Analysis*	*3*	*0*
EEE3522	*Communications Engineering*	*3*	*1*
EEE390X	*Elective Tutorial*	*0*	*1*
ECC3204	*Computer Architecture*	*3*	*0*
ECC3014	*Engineering Statistics*	*3*	*0*
ECC3404	*Multimedia Systems*	*2*	*1*
	TOTAL	***14***	***3***

4TH YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EEE4911	*Industrial Training*	*0*	*5*
EEE4949A	*Bachelor's Project*	*0*	*2*
EEE4947	*Electrical and Electronic Systems Design Project*	*0*	*4*
EEE3326	*Electrical Wiring Design*	*3*	*0*
EEE3327	*Electrical Power Generation and Utilisation*	*3*	*0*
*EEE*****	*Elective I*	*3*	*0*
*EEE*****	*Elective II*	*3*	*0*
	TOTAL	***12***	***11***

CODE	*COURSE NAME*	*L*	*L/T*
ECV3011	*Engineers and Society*	*2*	*1*
EEE4949B	*Bachelor's Project*	*0*	*4*
EEE3320	*High Voltage Engineering*	*3*	*0*
*EEE*****	*Elective III*	*3*	*0*
*EEE*****	*Elective IV*	*3*	*0*
	TOTAL	***11***	***5***

STUDY SCHEME (BACHELOR OF CHEMICAL ENGINEERING)

Notes : L = Lecture , L/T = Laboratory/Tutorial

SEMESTER 1

1ST YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECH3101	*Materials Science*	*3*	*0*
ECH3114	*Material Balance*	*2*	*1*
ECC3011	*Engineering Mathematics I*	*3*	*0*
CHM3010	*Physical and Inorganic Chemistry*	*3*	*1*
SKP2101	*Malaysian Nationhood*	*3*	*0*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***14***	***3***

SEMESTER 2

CODE	*COURSE NAME*	*L*	*L/T*
ECH3115	*Energy Balance*	*2*	*1*
ECC3012	*Engineering Mathematics II*	*3*	*0*
EMM3305	*Fluid Mechanics I*	*3*	*0*
CHM3201	*Organic Chemistry I*	*3*	*1*
BBI2423	*Academic Interaction and Presentation*	*2*	*1*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***13***	***4***

2ND YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECH3116	*Heat and Mass Transfer Processes*	*4*	*0*
ECH3902	*Chemical Engineering Laboratory I*	*0*	*1*
ECH3907	*Computer Aided Chemical Engineering Drawing*	*1*	*2*
EMM3213	*Thermodynamics I*	*3*	*0*
EMM3103	*Statics*	*3*	*0*
SKP2204	*Ethnic Relation*	*2*	*0*
	TOTAL	***13***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
ECH3120	*Chemical Engineering Thermodynamics*	*3*	*0*
ECH3117	*Unit Operation*	*3*	*0*
ECH3119	*Numerical Method and Optimisation Process*	*2*	*1*
ECH3705	*Integrated Project*	*0*	*1*
ECH3904	*Chemical Engineering Laboratory II*	*0*	*1*
ECC3014	*Engineering Statistics*	*3*	*0*
BBI2424	*Academic Writing*	*2*	*1*
	TOTAL	***13***	***4***

3RD YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECH3121	*Process Control and Instrumentation*	*3*	*1*
ECH3118	*Physical Separation Processes*	*3*	*0*
ECH3201	*Biochemical Engineering*	*2*	*1*
ECH3603	*Project Development and Management*	*3*	*0*
ECH3704	*Chemical Engineering Reaction Kinetics*	*3*	*0*
ECH3903	*Engineering Laboratory*	*0*	*1*
	TOTAL	***14***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
ECH3501	*Pollution Control Engineering*	*3*	*0*
ECH3602	*Safety and Risk Assessment*	*3*	*0*
ECH3706	*Process and Plant Design*	*2*	*2*
ECH3905	*Chemical Engineering Laboratory III*	*0*	*1*
ECV3011	*Engineers and Society*	*2*	*1*
ECH3604	*Hazard and Operability Studies*	*3*	*0*
	TOTAL	***13***	***4***

4TH YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECH4901	*Industrial Training*	*0*	*5*
ECH4949A	*Bachelor's Project*	*0*	*2*
ECH3703	*Plant Design Project*	*0*	*4*
ECH4306	*Process and Product Engineering*	*3*	*0*
ECH4305	*Process Design and Integration*	*3*	*0*
SKP2203	*Islamic Civilization and Asian Civilization*	*2*	*0*
	TOTAL	***8***	***11***

CODE	*COURSE NAME*	*L*	*L/T*
ECH4949B	*Bachelor's Project*	*0*	*4*
*E**4****	*Elective I*	*3*	*0*
*E**4****	*Elective II*	*3*	*0*
*E**4****	*Elective III*	*3*	*0*
PRT2008	*Agriculture and Man*	*2*	*0*
	TOTAL	***11***	***4***

STUDY SCHEME (BACHELOR OF COMPUTER AND COMMUNICATION SYSTEMS ENGINEERING)

Notes : L = Lecture , L/T = Laboratory/Tutorial

SEMESTER 1

SEMESTER 2

1ST YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC3011	*Engineering Mathematics I*	*3*	*0*
ECC3005	*Computer Programming*	*2*	*1*
ECC3115	*Electric Circuit Analysis*	*3*	*1*
PRT2008	*Agriculture and Man*	*2*	*0*
SKP2101	*Malaysian Nationhood*	*3*	*0*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***13***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
ECC3012	*Engineering Mathematics II*	*3*	*0*
ECC3116	*Digital Logic*	*3*	*1*
ECC3112	*Engineering Algorithms*	*2*	*1*
BBI2423	*Academic Interaction and Presentation*	*2*	*1*
SKP2203	*Islamic Civilization and Asian Civilization*	*2*	*0*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***12***	***4***

2ND YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC3013	*Engineering Mathematics III*	*3*	*0*
ECC3117	*Electronic Devices and Circuits*	*3*	*1*
ECC3304	*Digital Systems Design*	*3*	*1*
BBI2424	*Academic Writing*	*2*	*1*
SKP2204	*Ethnic Relation*	*2*	*0*
	TOTAL	***13***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
ECC3014	*Engineering Statistics*	*3*	*0*
ECC3118	*Microprocessor*	*3*	*1*
ECC3119	*Electronic Communication Circuits*	*3*	*1*
ECC3120	*Signals and Systems*	*3*	*0*
ECC3121	*Electromagnetic Waves*	*3*	*0*
	TOTAL	***15***	***2***

3RD YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC3113	*Digital Communications*	*3*	*1*
ECC3204	*Computer Architecture*	*3*	*0*
ECC3403	*Digital Signal Processing*	*3*	*0*
ECC3702	*Computer Networks*	*3*	*1*
EMM3612	*Engineering Project Management*	*3*	*0*
	TOTAL	***15***	***2***

CODE	*COURSE NAME*	*L*	*L/T*
ECC3114	*Feedback Control For Computer Systems*	*3*	*0*
ECC3205	*Operating Systems*	*3*	*0*
ECC3303	*Embedded Systems Design*	*2*	*1*
ECC3404	*Multimedia Systems*	*2*	*1*
ECC3603	*Optical Communications*	*3*	*1*
ECC3904	*Seminar*	*0*	*1*
	TOTAL	***13***	***4***

4TH YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC4911	*Industrial Training*	*0*	*5*
ECC4949A	*Bachelor's Project*	*0*	*2*
ECC4947	*Computer and Communication Systems Design Project*	*0*	*4*
ECC4505	*Mobile Radio and Satellite Communications*	*3*	*0*
*ECC4****	*Elective I*	*3*	*0*
*ECC4****	*Elective II*	*3*	*0*
	TOTAL	***9***	***11***

CODE	*COURSE NAME*	*L*	*L/T*
ECC4949B	*Bachelor's Project*	*0*	*4*
ECV3011	*Engineers and Society*	*2*	*1*
*ECC4****	*Elective III*	*3*	*0*
*ECC4****	*Elective IV*	*3*	*0*
*ECC4****	*Free Elective*	*3*	*0*
	TOTAL	***11***	***5***

STUDY SCHEME (BACHELOR OF MECHANICAL ENGINEERING)

Notes : L = Lecture , L/T = Laboratory/Tutorial

SEMESTER 1

1ST YEAR

CODE	*COURSE NAME*	*L*	*L/T*
ECC3011	*Engineering Mathematics I*	*3*	*0*
EMM3103	*Statics*	*3*	*0*
EMM3122	*Engineering Materials*	*3*	*0*
EMM3518	*Computer Aided Engineering Drawing*	*1*	*2*
PRT2008	*Agriculture and Man*	*2*	*0*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***12***	***3***

SEMESTER 2

CODE	*COURSE NAME*	*L*	*L/T*
ECC3012	*Engineering Mathematics II*	*3*	*0*
EMM3105	*Dynamics*	*3*	*0*
EMM3126	*Introduction to Programming Language*	*1*	*2*
EMM3409	*Strength of Materials I*	*3*	*0*
EMM3806	*Mechanical Engineering Laboratory I*	*0*	*1*
BBI2423	*Academic Interaction and Presentation*	*2*	*1*
*QK******	*Co-curriculum*	*0*	*1*
	TOTAL	***12***	***5***

2ND YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EMM3132	*Applied Engineering Mathematics And Statistics*	*3*	*0*
EMM3213	*Thermodynamics I*	*3*	*0*
EMM3305	*Fluid Mechanics I*	*3*	*0*
EMM3410	*Strength of Materials II*	*2*	*1*
EMM3808	*Mechanical Engineering Laboratory II*	*0*	*1*
BBI2424	*Academic Writing*	*2*	*1*
	TOTAL	***13***	***3***

CODE	*COURSE NAME*	*L*	*L/T*
EEE3020	*Electrical and Electronic Technology*	*2*	*1*
EMM3214	*Thermodynamics II*	*3*	*0*
EMM3306	*Fluid Mechanics II*	*3*	*0*
EMM3610	*Engineering Economic Analysis*	*3*	*0*
EMM3722	*/ Manufacturing Technology And Processes*	*3*	*0*
EMM3810	*Mechanical Engineering Laboratory III*	*0*	*1*
SKP2204	*Ethnic Relation*	*2*	*0*
	TOTAL	***16***	***2***

3RD YEAR

CODE	*COURSE NAME*	*L*	*L/T*
EMM3520	*Instrumentation And Control*	*3*	*0*
EMM3507	*Engineering Design I*	*2*	*1*
EMM3524	*Mechanics of Machines*	*3*	*0*
EMM3526	*Computer Aided Engineering*	*1*	*2*
EMM3612	*Engineering Project Management*	*3*	*0*
EMM3614	*Industrial Health and Safety*	*3*	*0*
EMM3812	*Mechanical Engineering Laboratory IV*	*0*	*1*
	TOTAL	***15***	***4***

CODE	*COURSE NAME*	*L*	*L/T*
ECV3011	*Engineers and Society*	*2*	*1*
EMM3218	*Heat Transfer*	*3*	*0*
EMM3509	*Engineering Design II*	*1*	*2*
EMM3528	*Mechanical Vibration*	*3*	*0*
EMM3706	*Production Planning And Automation System*	*3*	*0*
EMM3814	*Mechanical Engineering Laboratory V*	*0*	*1*
	TOTAL	***12***	***4***

4TH YEAR

CODE	*COURSE NAME*	*L*	*L/T*
*EMM*****	*Elective I*	*3*	*0*
*EMM*****	*Elective II*	*3*	*0*
EMM3707	*Manufacturing System Design*	*3*	*0*
EMM4911	*Industrial Training*	*0*	*5*
EMM4947	*Mechanical Engineering Design Project*	*0*	*4*
EMM4949A	*Bachelor's Project*	*0*	*2*
	TOTAL	***9***	***11***

CODE	*COURSE NAME*	*L*	*L/T*
*EMM*****	*Technical Elective III*	*3*	*0*
*EMM*****	*Technical Elective IV*	*3*	*0*
EMM4949B	*Bachelor's Project*	*0*	*4*
SKP2101	*Malaysian Nationhood*	*3*	*0*
SKP2203	*Islamic Civilization and Asian Civilization*	*2*	*0*
	TOTAL	***11***	***4***

STUDY SCHEME (BACHELOR OF PROCESS AND FOOD PROCESSING)

Notes : L = Lecture , L/T = Laboratory/Tutorial

SEMESTER 1

1ST YEAR

CODE	COURSE NAME	L	L/T
ECC3011	Engineering Mathematics I	3	0
EPF3108	Mass and Energy Balance	3	0
PRT2008	Agriculture and Man	2	0
SKP2101	Malaysian Nationhood	3	0
SKP2203	Islamic Civilization and Asian Civilization	2	0
QK*****	Co-curriculum	0	1
	TOTAL	**13**	**1**

SEMESTER 2

1ST YEAR

CODE	COURSE NAME	L	L/T
ECC3012	Engineering Mathematics II	3	0
EMM3305	Fluid Mechanics I	3	0
EMM3518	Computer Aided Engineering Drawing	1	2
EPF3001	Statics and Strength of Materials	3	0
BBI2423	Academic Interaction and Presentation	2	1
SKP2204	Ethnic Relation	2	0
QK*****	Co-curriculum	0	1
	TOTAL	**14**	**4**

2ND YEAR

CODE	COURSE NAME	L	L/T
EEE3020	Electrical and Electronic Technology	2	1
EMM3213	Thermodynamics I	3	0
EPF3109	Numerical and Computer Methods	2	1
EPF3603	Engineering Properties of Biological Material	3	0
BBI2424	Academic Writing	2	1
	TOTAL	**12**	**3**

2ND YEAR

CODE	COURSE NAME	L	L/T
ECC3014	Engineering Statistics	3	0
ECH3120	Chemical Engineering Thermodynamics	3	0
ECH3116	Heat and Mass Transfer Processes	4	0
EPF3104	Food and Process Engineering Laboratory I	0	1
EPF3107	Microbiology and Safe Food Processing	3	0
FST3107	Introduction to Food Chemistry	2	1
	TOTAL	**15**	**2**

3RD YEAR

CODE	COURSE NAME	L	L/T
EPF3105	Food and Process Engineering Laboratory II	0	1
EPF3202	Food Engineering Unit Operations	3	0
EPF3203	Separation Process	3	0
EPF3304	Process Control	3	0
EPF3501	Waste Treatment and Utilisation	3	0
EPF3801	Reaction Kinetics and Reactor Design	3	0
	TOTAL	**15**	**1**

3RD YEAR

CODE	COURSE NAME	L	L/T
ECV3011	Engineers and Society	2	1
EPF3106	Food and Process Engineering Laboratory III	0	1
EPF3502	Occupational Safety and Health In Processing Industries	3	0
EPF4801	Process Equipment Design	3	0
EPF4802	Process and Food Plant Design	3	0
EPF4804	Process Simulation and Optimization	2	1
	TOTAL	**13**	**3**

4TH YEAR

CODE	COURSE NAME	L	L/T
EPF4001	Production and Operation Management	3	0
EPF4947	Process and Food Plant Design Project	0	4
EPF4911	Industrial Training	0	5
EPF4949A	Bachelor's Project	0	2
EPF4***	Elective I	3	0
EPF4***	Elective II	3	0
EPF4***	General Elective I	3	0
	TOTAL	**12**	**11**

4TH YEAR

CODE	COURSE NAME	L	L/T
EPF3701	Packaging Engineering	3	0
EPF4949B	Bachelor's Project	0	4
EPF4***	Elective III	3	0
EPF4***	General Elective I	3	0
EPF4***	General Elective II	3	0
	TOTAL	**12**	**4**

COURSE SYNOPSIS

Department of Aerospace Engineering

EAS3122 Numerical Analysis for Engineering Applications 2 (2+0)

Prerequisite : ECC3012

This course is centered around the application of numerical methods in engineering mathematics problems. It covers linear and nonlinear algebraic equations, eigenvalue problems, ordinary and partial differential equations, vector calculus, and Fourier Transform. The topics are discussed together with computer exercises to reinforce understanding

EAS3123 Management of Aerospace 2 (2+0)

Prerequisite : None

This course provides an overview of the aerospace industry development and management. Topics covers include the global market outlook, maintenance repair overhaul, aerospace manufacturing, system integration, engineering and design services, and education and training. Strategic analysis on local gap case study will also be introduced based on seven enablers: policy, institutional framework, regulatory framework, R&T, investment and funding, human capital, and market

EAS3212 Aerodynamics I 3 (3+0)

Prerequisite : EAS3305

This course covers basic aerodynamics principles for incompressible flow and their applications in aerospace engineering. Emphasis is given on inviscid and viscous effects for a flow over an airfoil and finite wing

EAS3214 Aerodynamics II 3 (3+0)

Prerequisite : EAS3212

This course covers basic aerodynamics principles for compressible flow and their applications in aerospace engineering. Emphasis is given on inviscid and viscous effects for flow at high subsonic and supersonic conditions

EAS3215 Flight Mechanics 3 (3+0)

Prerequisite : EAS3212

The course covers introduction to the subject of flight mechanics through a discussion on aerodynamics forces on aircraft leading to the analysis of the performance during different flight phases such as cruise, take off, landing and turning

EAS3313 Control Systems 3 (3+0)

Prerequisite : ECC3012 and EAS3322

This course covers the basics of control systems. Discussions include mathematical modeling of the systems, characteristics, stability and design of simple control system

EAS3314 Aircraft Stability and Control 3 (3+0)

Prerequisite : EAS3313

This course covers an introduction to system stability, followed by static stability and control. Emphasis is given to aircraft equations of motions, longitudinal and lateral motion and automatic control theory

EAS3411 Aerospace Materials and Processes 2 (2+0)

Prerequisite : None

This course covers an introduction to the fundamental of materials. Emphasis on material's structures, properties and strengthening method as well as advanced engineering materials are included

EAS3322 Vibration 3 (3+0)

Prerequisite : None

The course covers the basic principless of vibration and its applications. Topics include one degree of freedom, multi degrees of freedom systems and continuous systems of damped and undamped systems under free vibration response and harmonic excitation. Emphasis is also given on the design of vibration suppression as well as the experimental modal analysis

EAS3434 Aerospace Structures I 3 (3+0)

Prerequisite : EMM3409

This course covers the fundamental analysis of aircraft basic structures. The principles of aircraft construction, analysis of basic aircraft structures and fatigue analysis are also discussed

EAS3435 Aerospace Structures II 3 (3+0)

Prerequisite : EAS3424

This course covers the analysis of aircraft structures and composites. Emphasis is given on the stress analysis and instability of aerospace structures as well as strength analysis of laminated composites

EAS3513 Propulsion 3 (3+0)

Prerequisite : EAS3521

This course covers the introduction to propulsion in aircraft and spacecraft. Gas turbine engine construction & design, systems & accessories and maintenance & testing are discussed. It also covers the working principle and design of rocket engines

EAS3514 Space Launch Technology 3 (3+0)

Prerequisite : EAS3513

This course covers the rocket launching aspects. Exposures are given on the types, modeling, control and performance of rockets as well as mission planning

EAS3521 Aerothermodynamics 3 (3+0)

Prerequisite : None

This course covers the introduction to engineering technique for solving thermodynamics in aerospace applications. Emphasis is given to application of the heat transfer, first law of thermodynamics, the second law of thermodynamics, and thermodynamics of high-speed gas

EAS3622 Avionics 2 (2+0)

Prerequisite : None

This course covers aircraft avionic systems. Topics include aircraft instrumentation, display, navigation, control, flight management and communication systems

EAS3623 Aerospace Electrical and Electronics 3 (2+1)

Prerequisite : None

This course covers basic concepts of electric and electronic circuits in aerospace engineering. Topics include analogue and digital systems as well as aircraft electrical system

EAS3723 Fixed Wing Aircraft Design 3 (3+0)

Prerequisite : EAS3215

This course covers the principles of conceptual fixed wing aircraft design process. The emphasis includes configuration design, sizing, primary subsystems selection, performance evaluation and cost prediction methods

EAS3811 Space Mechanics 3 (3+0)

Prerequisite : EAS3104

This course covers the study of the motion of man-made objects in space subject to both natural and artificially-induced forces. Emphasis on the fundamentals of astrodynamics, orbit determination, observation and transformation, orbital manoeuvers, and interplanetary trajectory are given

EAS3812 Satellite Technology 3 (3+0)

Prerequisite : None

This course covers the principles of satellite subsystems and their integrated performance in space. Topics include spacecraft environment, space structures, various satellite subsystems, onboard equipment and satellite testing

EAS3931 Aerospace Laboratory I 1 (0+1)

Prerequisite : EAS3411 and EAS3622

This course covers a series of experiments related to basic principles of engineering materials and avionics as well as performing risk assessments and workshop activities

EAS3932 Aerospace Laboratory II 1 (0+1)

Prerequisite : EMM3409, EAS3212, EAS3322 and EAS3521

This course covers a series of experiments related to basic principles of strength of materials, structural dynamics, thermofluid and aerodynamics as well as performing risk assessments and case study

EAS3933 Aerospace Laboratory III 1 (0+1)

Prerequisite : EAS3215, EAS3313, EAS3513 and EAS3802

This course covers a series of experiments related to basic principles of flight mechanics, control, satellite and propulsion systems as well as performing risk assessments and case study

EAS4211 Computational Fluid Dynamics 3 (3+0)

Prerequisite : None

The course covers an introduction to computational fluid dynamics and its applications. Emphasis is given to numerical methods and solution procedures. Application of commercial CFD software are also studied

EAS4212 Fundamentals of Helicopter Flight 3 (3+0)

Prerequisite : None

This course covers an introduction to rotary wing engineering. Emphasis is given to aerodynamics and performance of helicopter as well as flight control law

EAS4311 Flight Dynamics 3 (3+0)

Prerequisite : None

The course begins with an introduction and a review of aircraft equation of motion. Topics of stability and control, longitudinal and lateral dynamics, and handling qualities are discussed

EAS4313 Automatic Flight Control Systems 3 (3+0)

Prerequisite : None

The course covers the topics in automatic flight control using both classical and modern control approaches. Topics include stability augmentation systems, autopilot systems, and navigational systems for both longitudinal and lateral-directional dynamics

EAS4411 Finite Element Analysis 3 (3+0)

Prerequisite : None

This course covers the fundamental concepts, energy and displacement formulations of finite element method. Emphasis is given on the solution of one and two dimensional elements as well as practical applications using finite element commercial software

EAS4413 Experimental Stress Analysis 3 (3+0)

Prerequisite : None

This course covers the fundamental of experimental stress analysis. Topics include fundamental stress and strain concept, followed by discussion on various stress and strain measurement techniques and related instrumentation

EAS4404 Advanced Composite Materials 3 (3+0)

Prerequisite : None

This course presents a comprehensive overview on advanced composite materials covering the basic structures, processes, mechanics and failures

EAS4405 Aeroelasticity 3 (3+0)

Prerequisite : None

This course covers the fundamental principles of aeroelastic phenomena and methods for aeroelastic analysis for both static and dynamics conditions. Topics include divergence, control effectiveness, control reversal, flutter instability, gust response as well as the underlying approaches in current engineering practices

EAS4412 Non-Destructive Testing Techniques 3 (3+0)

Prerequisite : None

The course covers the introduction to NDT for Aerospace Engineering. The topics included are damage detection, Ultrasonic Testing, advanced and other types of NDTs, reliability and applications of NDT in Aerospace Engineering

EAS4511 Air Breathing Engine 3 (3+0)

Prerequisite : None

The course covers the theory and design of air breathing engine. Topics include the components in air breathing engine, functions, design parameters, energy transfer and prediction of performance. Components matching and effect of environment from the air breathing engines are also covered

EAS4512 Solid Propellant Propulsion 3 (3+0)

Prerequisite : None

The course covers the study of solid propellant propulsion in aerospace industry. The solid propellant rocket fundamentals, classifications, combustion, components and motor design, and performance are covered. Hybrid propellant rocket and thrust vector control topics are also included

EAS4703 Aerospace Simulation Modeling 3 (3+0)

Prerequisite : None

This course covers the basic principles of simulation and statistical modeling in solving design problems. Emphasis is given on the techniques for random number generation, design of experiment, statistical data analysis and Monte Carlo simulation

EAS4702 Design Optimization Technique 3 (3+0)

Prerequisite : None

This course covers the basic principles and concepts on both classical and modern methods of engineering design optimization techniques. Emphasis is given on single-variable, multi-variable and heuristic optimization techniques

EAS4811 Aerospace Software Engineering 3 (3+0)

Prerequisite : None

This course covers the development of aerospace software. Approaches on real-time systems for critical applications, failure analysis, and software management are also given

EAS4813 Spacecraft Dynamics and Control 3 (3+0)

Prerequisite : None

This course treats spacecraft dynamics and control. This includes the formulation of equations for the orbital and rotational motion of spacecraft and the use of these equations to formulate and solve spacecraft control problems

EAS4805 Inhabited Space Module 3 (3+0)

Prerequisite : None

This course covers the space station aspects. Emphasis is given on orbit environment, space conditions and human aspect

EAS4911 Industrial Training 5 (0+5)

Prerequisite : After completing 6 semesters

In this course, students will be exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized

EAS4947 Aerospace Design Project 4 (0+4)

Prerequisite : EAS3723

This course features a team based project on the design of aerospace vehicle that relate the system integration between aerodynamics, structures & materials, dynamics & control, propulsion, performance, and internal systems for a given specific mission requirement. The design project activities begin with the conceptual design phase, followed by preliminary and detail design phases. This involves market study, project planning, modelling & simulation, cost analysis, prototype development and testing processes

EAS4949 Bachelor's Project 6 (0+6)

Prerequisite : Final Year Student

This course covers the aspects of planning and executing project. These include title selection, conducting critical review, designing and performing work strategy, collecting and analysing data, documenting and presenting project output

Department of Civil Engineering

ECV3011 Engineers and Society 3 (2+1)

Prerequisite : None

This course covers the engineers' profession, ethic and responsibility in relation to environmental, socio-economic, sustainability, safety and health issues, legal system, contract law, management and entrepreneurship. This course also involves application of engineering knowledge through joined activities with the community

ECV3111 Engineering Mechanics 3 (3+0)

Prerequisite : None

The course covers the principles of statics and dynamics which include forces in beam, frame and truss structures. Analysis in friction, centre of gravity and centroid, and moment of inertia are also discussed

ECV3112 Civil Engineering Materials 3 (2+1)

Prerequisite : None

This course covers types and properties of civil engineering materials used in construction such as aggregates, cement, fresh concrete, and hardened concrete. Masonry and steel are also discussed

ECV3113 Integrated Project 3 (3+0)

Prerequisite : ECV3518

This course requires students to produce creative ideas and solution to a given problem that requires solution in an integrated approach with consideration of cost effectiveness and practicality. Students are required to construct, test and evaluate the model using appropriate theory

ECV3211 Mechanics of Materials 3 (3+0)

Prerequisite : ECV3111

The course covers stress and strain due to load and temperature. Discussion also covers torsion, Mohr's circle, buckling, and plasticity concept

ECV3212 Structural Analysis I 3 (2+1)

Prerequisite : ECV3211

The course covers analysis of determinate structures, which include frames, trusses, arch and cable. It also covers influence lines diagram, principles of virtual work and reciprocal

ECV3213 Structural Analysis II 3 (3+0)

Prerequisite : ECV3212

The course covers analysis of indeterminate structures using various methods such as energy method, slope deflection method, moment distribution method, plastic analysis of structures and matrix method. Usage of software in structural analysis is also introduced

ECV3214 Reinforced Concrete Structure Design 3 (3+0)

Prerequisite : ECV3212

This course covers design of reinforced concrete structure elements including rectangular and flanged beams, solid slabs, columns, pad footing and pile cap. It includes principle of structures, loading systems, use of the code of practices and detailing of reinforcement

ECV3215 Design of Steel and Timber Structure 2 (2+0)

Prerequisite : ECV3212

This course covers design of steel and timber structural members using appropiate design codes. It involves design of laterally restrained and unrestrained steel beams, members in compression and tension, as well as design of timber beams, columns and trusses

ECV3311 Engineering Geology 3 (2+1)

Prerequisite : None

This course covers identifications of minerals and rocks formations. It also covers use of geological information to solve engineering problems

ECV3312 Soil Mechanics I 3 (3+0)

Prerequisite : None

This course covers basic principles of soil mechanics such as physical and mechanical properties of soil. It also covers classification of soils, groundwater and seepage, soil compaction and soil stresses

ECV3313 Soil Mechanics II 3 (2+1)

Prerequisite : ECV3312

This course covers analysis of shear strength, compression, consolidation of soil and basic principles of lateral earth pressure. Types of retaining structure, slope stabilisation, analysis method and safety factor are also discussed

ECV3411 Hydraulics I 3 (3+0)

Prerequisite : None

This course covers basic principles and concepts of fluid mechanics which includes fluid properties, fluid pressure and forces in static and moving fluids. Flow in pipes and fluid machines as well as dimensional analysis are also discussed

ECV3412 Hydraulics II 3 (2+1)

Prerequisite : ECV3411

This course covers analysis of flow in open channels and hydraulic structures, design of water distribution systems as well as hydraulic similitude and models. It includes laboratory works on fluid mechanics and hydraulics

ECV3413 Environmental Engineering 4 (3+1)

Prerequisite : None

This course covers important environmental issues, water and wastewater treatment processes and design of sanitary sewer system. It includes laboratory works on water and wastewater quality

ECV3414 Engineering Hydrology 3 (3+0)

Prerequisite : ECV3411

This course covers the main applications of hydrology in engineering such as the rainfall-runoff relationship, flow routing and frequency analysis. Design of stormwater systems is also discussed

ECV3511 Geomatics Engineering 3 (2+1)

Prerequisite : None

This course covers theoretical and practical aspects of surveying techniques for engineering such as levelling, angle measurement and indirect distance measurement. Topographic surveying, areas and

volumes, construction surveying and road curve preparation are also discussed

ECV3611 Transportation Engineering 3 (3+0)

Prerequisite : None

This course covers the fundamental principles of transportation engineering with focus on the methods and procedures related to the planning, design and maintenance of highway, airport and railway. Transportation impact assessment and concept of sustainable transportation are also discussed

ECV3612 Traffic Engineering 3 (2+1)

Prerequisite : None

This course covers traffic analysis and methods of traffic control which include traffic flow characteristics, traffic control devices, data collection techniques, parking studies and junction systems. It includes practical works on traffic data collection

ECV3613 Highway Engineering 3 (2+1)

Prerequisite : ECV3611

This course covers design and maintenance of highway pavements which includes flexible and rigid pavements. Highway drainage with focus on selection of materials is also discussed

ECV3711 Construction Quantity Measurement 3 (3+0)

Prerequisite : None

This course covers the quantity measurement according to the standard methods. Preparation of bills and document of quantity for construction works are also discussed

ECV3712 Project Management 3 (3+0)

Prerequisite : None

This course covers principles of engineering project management, which involves construction contract, settlement of disputes, planning. Scheduling and project supervision as well as tender estimation and evaluation are also discussed

ECV3713 Building Information Modelling for Engineers 3 (3+0)

Prerequisite : None

The course covers concepts, innovative processes and application of Building Information Modelling in architecture, engineering and construction industries. Computer skills which utilise Building Information Modelling are emphasized

ECV4911 Industrial Training 5 (0+5)

Prerequisite : After completing 6 semesters

In this course, students will be exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized

ECV4947 Civil Engineering Design Project 4 (0+4)

Prerequisite : None

This course covers the integrated design of civil engineering in multidisciplinary orientation. Design processes involving market study, project planning and execution, cost analysis, and preparation of detailed engineering drawing are discussed. Aspects of public health and safety, culture, society, economics, and environment are emphasized

ECV4949 Bachelor's Project 6 (0+6)

Prerequisite : Final Year Student

This course covers the aspects of planning and executing project. These include title selection, conducting critical review, designing and performing work strategy, collecting and analysing data, documenting and presenting project output

ECV4211 Advanced Structural Analysis 3 (3+0)

Prerequisite : ECV3213

This course covers advanced structural analysis on trusses, beams, frames, shells and plates using matrix and finite element methods. It also involves application of finite element software

ECV4212 Design of Tall Buildings 3 (3+0)

Prerequisite : ECV3213

This course covers analysis and design of multi-storey building structures of different systems. It also includes aspects of earthquake engineering

ECV4213 Bridge Engineering 3 (3+0)

Prerequisite : ECV3213

This course covers aspects of planning, design and construction of bridges including its substructure. It also involves analysis of various bridge models with different load arrangement using various methods

ECV4214 Prestress and Precast Structures 3 (3+0)

Prerequisite : ECV3213

This course covers principles and analysis methods of prestress and precast, materials and stress limits, analysis and design of flexural members as well as composite beam. Loss of prestress, ultimate limit state, deflection and design of prestressed and precast structures are also discussed

ECV4215 Structural Dynamics and Earthquake 3 (3+0)

Prerequisite : ECV3213

The course covers the principles of structural dynamics which include forces in dynamics and vibration systems. Basic concept of earthquake engineering and the seismic resistance structure are also discussed

ECV4311 Design of Foundation 3 (3+0)

Prerequisite : ECV3314

This course covers design and evaluation of various foundation systems, such as spread footing, raft foundationa and piles. Soil improvement techniques is also discussed

ECV4312 Retaining Structures 3 (3+0)

Prerequisite : ECV3313

This course covers analysis of lateral pressure and design of retaining structures. It also involves applications of software in analysis and design of retaining structures

ECV4313 Geo-Environmental Engineering 3 (3+0)

Prerequisite : ECV3313

This course covers geotechnical and geo-environmental problems related to soil and contaminants. Containment system and treatment technologies are also discussed

ECV4314 Slope Engineering 3 (3+0)

Prerequisite : ECV3313

This course covers analysis and design of soil and rock slopes for stability as well as erosion protection and rehabilitation works. Besides that, erosion protection using biotechnic method is also emphasised

ECV4315 Tunnel Engineering 3 (3+0)

Prerequisite : ECV3311

This course covers principles of tunneling, ground improvement techniques, design and analyses of tunnel stability. Construction techniques, monitoring of tunnels as well as selected case studies are also discussed

ECV4411 River Engineering 3 (3+0)

Prerequisite : ECV3414

This course covers aspects of engineering related to rivers, such as river stabilisation, estimation of sediment transport and flood control works. It also includes construction of structures in rivers and hydroelectric generation

ECV4413 Groundwater Engineering 3 (3+0)

Prerequisite : ECV3414

This course covers the production and flow of groundwater in different types of aquifers, design of well, transport of contaminants both in the unsaturated and saturated zones. control and remediation techniques are also discussed

ECV4412 Water And Wastewater Treatment 3 (3+0)

Prerequisite : ECV3413

This course covers advanced techniques in water and wastewater treatment. Among the topic discussed includes non-conventional water treatment processes, advanced methods of removing nitrogen and phosphorus, as well as membrane filtration system

ECV4414 Solid Waste Management Engineering 3 (3+0)

Prerequisite : ECV3414

This course covers the characterisation of solid waste, design of sanitary landfill, appropriate technology with recycling and reuse of solid waste. Renewable energy recovery from solid waste is also discussed

ECV4415 Coastal Engineering 3 (3+0)

Prerequisite : ECV3412

This course covers analysis of sea wave mechanics and ocean tide as well as their effects on the coast. An application of engineering techniques for coastal shore protection and restoration is also discussed

ECV4511 Geospatial Engineering 3 (3+0)

Prerequisite : ECV3511

This course covers the use of Geografic Information System (GIS) and Remote Sensing. Global Navigation Satellite System (GNSS) technologies in the civil engineering field are also discussed

ECV4611 Road Transportation System Analysis 3 (3+0)

Prerequisite : ECV3612

This course covers freeway segment, weaving segment and ramp junctions. Travel demand forecasting, travel generation as well as travel distribution are also discussed

ECV4612 Pavement Engineering 3(3+0)

Prerequisite : ECV3613

This course covers the theory, analysis, design, evaluation and rehabilitation of pavemen that cover flexible and rigid pavements. Other pavements are also discussed

ECV4613 Road Construction and Maintenance 3 (3+0)

Prerequiste : ECV3613

This course covers the methods and strategies of road construction and maintenance. Among the topic discussed includes discussion on machines for construction and maintenance of roads

ECV4614 Traffic Safety and Management 3 (3+0)

Prerequisite : ECV3612

This course covers sustainable transport, traffic management, traffic calming and traffic accidents analysis. Traffic safety approach and Intelligent Transport Systems are also discussed

ECV4711 Construction Technology 3 (3+0)

Prerequisite : ECV3712

This course covers discussions on the equipment and machinery for construction works. Current construction technologies including industrialised building system are also discussed

ECV4712 Construction Industry Entrepreneurship 3 (3+0)

Prerequisite : ECV3712

This course covers entrepreneurship and business in construction industry, which cover identification of business opportunities, forecast of cash flow, project financing and project cost control. Financial statements and business ethics are also discussed

Department of Biological and Agricultural Engineering

EAB3001 Workshop Management and Practice 1 (0+1)

Prerequisite : None

This course discusses the identification and management of fabrication workshop, safety in the conduct of the workshop, identify tools and equipment and its functions, identify materials and its functions, basic measurement, basic cutting, basic welding, basic lathe work and the operation and management of the project

EAB3014 Engineering Properties of Agricultural Materials 3 (3+0)

Prerequisite : EMM3409

This course covers material behaviours resulting from its properties and the importance of incorporating these variabilities in the development of a machine or process. Developmental aspects touched on are quality evaluation, measurement of intrinsic properties and consideration of properties in design

EAB3011 Analysis and Design of Structures 3 (3+0)

Prerequisite : EMM3409

This course covers the analysis of concrete structures and the designing of concrete members according to the Eurocodes Practice to meet the requirement of designing the farm structure suitable with local conditions.This course emphasize on the analysis of bending moment, shear force, deflection and internal force of various structure and concrete member design that comply with the principle of Limit State Design

EAB3212 Agricultural Process Engineering 3 (2+1)

Prerequisite : EAB3210

This course covers the application of engineering principles in the processing of agricultural materials. The teaching will focus on analysing, measuring and explaining the operations involved include fluid mechanics, size reduction, material separation processes, conveying systems, heat and mass transfer operations, drying, cooling, freezing, extraction and control elements in the processing of agricultural materials

EAB3216 Biosystems Environment 3 (3+0)

Prerequisite : None

This course covers the interaction between plant and animal kingdoms, environmental factors such as light and radiation, wind and humidity, soil and water that influence the crop growth and development. Students are also exposed to the environmental control for livestock and climatic requirements of crops

EAB3208 Agricultural Waste Management 3 (2+1)

Prerequisite : None

This course covers the principles to evaluate the impact of agricultural waste on the environment and to justify the suitable treatment process either biological processes (aerobic or anaerobic treatment), physical or chemical treatments in order to design the waste treatment system. The treatments of the solid waste and air pollution control related to agricultural industrial activities are also emphasized

EAB3210 Principles of Heat Transfer 3 (3+0)

Prerequisite : EMM3213

This course covers the methods of calculating heat transferred in conduction, convection and radiation, the relationship between heat and temperatures according to the principles of heat transfer and the approaches towards evaluating the need for heat exchangers in the operation of real systems

EAB3214 Geographic Information System Technology 3 (3+0)

Prerequisite : None

This course covers Geographical Information System (GIS) development. Emphisize given among others are GIS data structure, Relational Database Management System , data acquisition and presentation, spatial analysis, and implementation of GIS

EAB3312 Soil Engineering 3 (2+1)

Prerequisite : None

This course covers the classification and physical properties of soils. Emphasize given among others are soil exploration, soil permeability and seepage, stress in soil, soil compaction, compressibility of soil, shear strength of soil and lateral earth pressure

EAB3303 Hidrologi/ Hydrology 3 (3+0)

Prerequisite : None

This course covers the hydrological cycle and statistical methods in hydrology, precipitation and rainfall, interception, surface detention and infiltration, evaporation and evapotranspiration, surface runoff, hydrograph, groundwater and flood routing through reservoirs and channels

EAB3304 Hydraulics 3 (2+1)

Prerequisite : None

This course covers the application of hydraulics flow, losses in pipe flows, pipelines and pipe networks, uniform open channel flows, energy-depth relationships, theory and computations of gradually varied flows and rapidly varied open channel flows

EAB3316 Irrigation and Drainage Engineering 3 (2+1)

Prerequisite : EAB3304

This course covers soil-water-plant-atmosphere relationships for crop irrigation and agricultural drainage. Methods of irrigation and drainage, and system design, operation and management including pump selection are also discussed

EAB3514 Thermal and Fluid Machines 3 (2+1)

Prerequisite : EMM3305

This course covers the principles of operation and performance curves of internal combustion engines, pumps, turbines, boilers, fans and compressors, the measurement of operational inputs and efficiencies and the matching of the performance of a device to the specified task desired

EAB3516 Plantation Machinery 3 (2+1)

Prerequisite : None

This course covers the design of farm machinery and implements and their use in farmwork from land clearing to collection and transportation of farm produce. Farm machinery and implement management in the preparation of a business plan for agricultural production are also discussed

EAB3518 Machine Design 3 (2+1)

Prerequisite : EMM3409

This course covers the philosophy, concepts, procedures, codes and analysis techniques in the design of machines. Various theories that are involved in both static and fatique strength design are discussed. Analysis on strength are specifically explained for various types of beams, columns, flat plates, pressure vessels, shrink fit, connectors and fasterners

EAB3612 Biological System Instrumentation 3 (2+1)

Prerequisite : EEE3020

This course covers the characteristics of instrument and recording system for biology and agriculture. The course discuss on the common circuits for resistive, capacitive and inductive sensors, uncertainty analysis, analog signal conditioning and digital signal conditioning. The course also covers on the measurement instruments, temperature measurements, force, torque and pressure measurements, flow measurements and specialized measurements

EAB3614 Control System Engineering 3 (3+0)

Prerequisite : EAB3612

This course covers the methods of engineering control and machinery system and systems approach. It covers the principles of feedback control, the Laplace transform and inverse Laplace transform, transfer functions, dynamic model and dynamic response. Type of controllers, root locus design and analysis, frequency-response design method and control system design are also discussed

EAB4911 Industrial Training 5 (0+5)

Prerequisite : After completing 6 semesters

In this course, students will be exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized

EAB4947 Agricultural and Biosystem Engineering Design Project 4(0+4)

Prerequisite : None

The course covers the integrated design of agricultural and biosystems engineering in multi-discliplinary orientation. Design processes involving market study, project planning and execution, modelling and simulation, cost analysis and project development are emphasized. Aspects of public health and safety, culture, society, economics and environment are discussed.

EAB4949 Bachelor's Project 6 (0+6)

Prerequisite : Final Year Student

This course covers the aspects of planning and executing project. These include title selection, conducting critical review, designing and performing work strategy, collecting and analysing data, documenting and presenting project output

EAB4214 Unit Operations 3 (3+0)

Prerequisite : None

This course discusses the changes that occur to input materials when going through chemical, physical and biological processes to become final chemical or biological products. Process analysis is made by breaking down the process into separate and distinct steps called unit operations, including scaling

EAB4205 Controlled Environment 3 (3+0)

Prerequisite : None

This course covers skills to plan and design crops and animal production system based on environmental requirements for crops and animals. Emphasis given among others are knowledge on automation controls for higher production

EAB4216 Postharvest System Design 3 (3+0)

Prerequisite : None

This course covers design method of postharvest process flow for grains, vegetables and fruits. It also involves sorting, grading, conveying and storing techniques. Packaging method and postharvest plant layout design are also discussed

EAB4211 Postharvest Engineering 3 (3+0)

Prerequisite : None

This course covers postharvest engineering operation of several crops grains, fruits, vegetables and root crops. This course also discusses crop handling systems and ways to evaluate their effectiveness

EAB4315 Aquacultural Engineering 3 (3+0)

Prerequisite : None

This course covers the learning of biological and technical processes in aquaculture. Enclosed, open and integrated system design and principles in aquaculture production are also discussed

EAB4314 Groundwater 3 (3+0)

Prerequisite : None

This course covers the basic hydraulic aquifer; site investigation of groundwater; design, construction and commissioning of tube wells; principles of groundwater flow, well hydraulic and groundwater pumping test; quality and groundwater pollution and the effects of subsidence to land surface; Modeling techniques and ground water management are also discussed

EAB4308 Soil Erosion and Conservation 3 (3+0)

Prerequisite : None

This course covers principles of soil erosion such as factors that cause soil erosion, types of soil erosion, and mechanics of soil erosion. Models for estimating soil loss, sediment transport and sediment load, and methods control soil erosion and conserve agricultural soils and watersheds are also discussed

EAB4413 Remote Sensing Applications 3 (3+0)

Prerequsiite : None

This course covers the principles and applications of remote sensing. It also discusses satelite data processing methods. Image interpretation skills and spatial data classfication techniques are emphasized. Applications on land, sea and coastal zones are also explained

EAB4416 Precision Farming 3 (3+0)

Prerequisite : None

This course covers various site-specific concepts and sensing methods for precision farming applications. Topics of hetereogenity in fields, sensing by electromagnetic radiation, sensing of natural soil properties, sensing of crop properties, site-specific soil cultivation, sowing, cultivation, fertilizing, weed control, fungicide spraying, recording of yeilds, and information management are also discussed

EAB4312 Land Management 3 (3+0)

Prerequisite : None

This course focuses on the use and management of land resources in the humid tropics . It covers how to organize and classify land resources based on their potential to be used as agricultural land and describe current issues related

EAB4411 Agricultural System Modeling and Analysis 3 (3+0)

Prerequisite : None

This course covers the basic theoretical and development of mathematic models in agricultural systems. The construction of mathematic model, database collection, supporting software and information used to analyse the agricultural systems model simulation are discussed

EAB4412 Intelligent Systems for Agricultural and Biosystems Engineering 3 (3+0)

Prerequisite : None

This course covers applications of Intelligent System in agricultural and biosystems engineering. Techniques of Artificial Neural Network, Support Vector Machine, Fuzzy Logic, Genetic Algorithms, Bayesian and Decision Tree are also discussed. Fundamental techniques of machine vision is introduced at the beginning of the course and then integrated with computer software to design problem solving models in agricultural and biosystem engineering using Intelligent System

EAB4513 Design of Machine Components 3 (3+0)

Prerequisite : None

This course covers the design and selection of machine elements that are commonly used in agricultural machines and implement. The machine elements including axle and shaft, belt drives, chain drives, spur gear, helical gear, bevel gear, worm gear, keys, pins, splines, power screws and threaded fasterners, mechanical springs and coupling are also discussed

EAB4515 Off-Road Vehicles Engineering 3 (3+0)

Prerequisite : None

This course covers design and basic construction of an off-road vehicle. The standard performance of testing procedure for an offroad vehicle and its resultant report are discussed. Analysis on the wheel mechanics for traction and vehicle chassis mechanics for stability are elaborated in detail

EAB4517 Fluid Power 3 (3+0)

Prerequisite : None

This course covers the basics of hydraulics and pneumatics. Emphasize given among others are mechanics of hydraulic fluids, hydraulic prime mover,selections, types and power of hydraulic pumps, hydraulic valvesmotors, cylinders, reservoirs and hoses, hydraulic circuit analysis and design, pneumatics and penumatic factors, selection and power requirement for air compressor and receiver, pneumatic system control components, selection and measurement of pneumatic components, and analysis and design of pneumatic circuits

EAB4516 Automation in Agriculture 3 (3+0)

Prerequisite : None

This course covers on the principles, design and use of automation in agriculture sector. The course covers the components of the design of automation system such as sensor, drive system and actuators, programmable logic controllers (PLC) and microcomputer based controllers. Emphasize given among others are control system, hydraulic and pneumatic circuits controls and the application of automatic controls in agriculture

Department of Electrical and Electronic Engineering

EEE3020 Electrical and Electronic Technology 3 (2+1)

Prerequisite : None

This course covers the basic concept of electrical and electronic systems as well as instrumentations and measurements. It gives introduction to direct current circuit, single-phase and three-phase alternating current circuits, electrical machines, electronic devices and electronic circuits

EEE3121 Electrical and Electronic Principles 3 (3+0)

Prerequisite : None

This course introduces principles of electrical and electronic engineering. It covers circuit quantities and elements, as well as circuit theory. Introduction to electronic and magnetic circuits are also described

EEE3122 Semiconductor Devices 3 (3+0)

Prerequisite : None

This course focuses on three main categories of semiconductor devices, namely junction diode, bipolar transistor and field-effect transistor. Topics such as construction structures, principle of operation and typical characteristics of the devices are also discussed

EEE3123 Computer Programming 4 (3+1)

Prerequisite : None

This course covers computer organisation and techniques to solve problems in C language. Emphasis is given on good programming practices. Topics on data control, arrays and structures are also discussed

EEE3124 Instrumentations and Measurements 3 (3+0)

Prerequisite : None

This course covers principles of measurements, sensors and tranducers. Students are exposed to the design and usage of measurement instruments. Latest technology that uses computerised instrumentation systems as well as systems and management of standards are also introduced

EEE3125 Digital Circuits 3 (3+0)

Prerequisite : None

This course covers number systems and codes, logic functions, logic gates, logic family of integrated circuits and basic logic circuits. The analysis and design of digital circuits such as arithmetic circuits, selector and an encoder is also introduced

EEE3126 Electric Circuits 3 (3+0)

Prerequisite : EEE3121

This course covers analysis techniques for electric circuits with DC and AC sources. Circuit analysis techniques using Laplace transform, two-port and three-port networks and balanced three-phase circuits are also studied. Circuit simulator such as PSPICE is used

EEE3127 Analog Systems 4 (3+1)

Prerequisite : EEE3121

This course covers analysis and design of analog circuits and systems. Amplifier characteristics, transistor biasing techniques, small signal analysis and the concept of feedback are introduced and applied for various types of amplifiers and oscillator. This course also covers operational amplifier and applications such as adder and filter

EEE3128 Digital Systems 4 (3+1)

Prerequisite : EEE3125

This course covers the principles of synchronous and asynchronous digital system. Hardware Descriptive Language (HDL), logic programming. The application of these systems are also been discussed

EEE3130 Basic Electromagnetism 3 (3+0)

Prerequisite : None

The course includes three key elements of basic electromagnetism, ie, vector calculus, electrostatic and magnetostatic fields. Overall use in a variety of engineering applications are also described

EEE3131 Advanced Electromagnetism 3 (3+0)

Prerequisite : EEE3130

This course covers the Maxwell equations, wave electromagnetism, transmission line and electromagnetic compatibility for electromagnetism applications in particular. The usage in general engineering applications is also described

EEE3132 Microprocessor Technology 4 (3+1)

Prerequisite : None

This course covers architecture, operation and programming of microprocessor and interfacing for microprocessor system. Basic concept of microcontroller and its interfacing are also discussed

EEE3222 Microelectronic Principles 3 (3+0)

Prerequisite : EEE3125

This course covers the design and manufacturing of microelectronic circuits. Emphasis is given on the design fundamental of digital and analog circuits using microelectronic technologies such as MOS and bipolar

EEE3322 Power Electronics 3 (3+0)

Prerequisite : EEE3126

This course covers power devices and their applications. Emphasis is given to related circuits such as rectifiers, thyristor commutation, direct current choppers and inverters. Protection of devices is also discussed

EEE3324 Power System Analysis 3 (3+0)

Prerequisite : EEE3126

This course covers network modelling, load flow and power system control. Non-symmetrical fault and power system stability are also studied

EEE3323 Electrical Machines and Drives 3 (3+0)

Prerequisite : EEE3130

This course covers the construction, operation, control and drives of various electrical machine. Topics on magnetic circuit and transformer are introduced. Among the electrical machines discussed are dc machines, induction machines, synchronous machines, single phase motor and special machines

EEE3320 High Voltage Engineering 3 (3+0)

Prerequisite : None

The course covers generation and measurement of high voltage, electrostatic fields and field stress control, electrical breakdown in gases, solids and liquids, non destructive insulation test techniques, overvoltages and insulation

EEE3326 Electrical Wiring Design 3 (3+0)

Prerequisite : None

This course covers electrical wiring design from power system distribution. Wiring specification, protection system, special circuit and electric motor wiring are emphasised in designing the wiring system

EEE3421 Control Systems 3 (3+0)

Prerequisite : ECC3012

This course covers system modeling and analysis in time and frequency domains. Control system design is also introduced

EEE3422 Industrial Control Electronics 3 (3+0)

Prerequisite : None

This course covers devices and components in industrial control. The usage of Programmable Logic Controllers is emphasized

EEE3521 Signal Processing 3 (3+0)

Prerequisite : None

This course covers various types of signal and transform theory in signal processing. Analysis of analog and digital filters design are emphasized

EEE3522 Communications Engineering 4 (3+1)

Prerequisite : None

This course covers fundamental concepts of communications engineering. Topics discussed include noise, amplitude modulation (AM), angle modulation, angle receiver and frequency modulation (FM) stereo, digital modulation, and optical fibre communications

EEE3922 Electrical and Electronics Laboratory I 1 (0+1)

Prerequisite : None

This course covers topics on measurement of electrical quantities using the oscilloscope and meters, the use of function generator and any other basic equipment. Emphases are given to safety procedures when working in the electrical and electronics laboratories, measurement techniques, equipment calibrations and techniques on how to perform good practical works

EEE3924 Electrical Power Engineering Laboratory 1 (0+1)

Prerequisite : None

This course covers experiments related to electrical power engineering such as rectifiers, choppers and inverters. Experiments on various equipment and machine such as transformers, direct current (DC) machine, alternating current (AC) machine and generator are also covered

EEE3925 Control Engineering Laboratory I 1 (0+1)

Prerequisite : EEE3421

This course covers experiments on various techniques of analyses of open- and closed-loop control systems, process control and direct current (DC) servo. Software is also used to analyse the systems. Programming and applications of programmable logic controller are introduced

EEE3926 Microelectronics Laboratory 1 (0+1)

Prerequisite : EEE3128

This course covers integrated circuits design which involves circuit simulation, layout design, placement, routing and verification of cells. It includes logic design using hardware description language and development of prototypes and testing. Design and analysis of semiconductor devices are also introduced

EEE3927 Power System and Machine Laboratory 1 (0+1)

Prerequisite : None

This course covers experiments on various aspects of electrical power systems. Experiments related to power systems including transmission line characteristics, ground leakage protection, power factor correction, power quality measurement, three phase generator and alternating current (AC) filter. Simulation of power system and machine are also conducted

EEE3928 Control Engineering Laboratory II 1 (0+1)

Prerequisite : EEE3421

This course covers experiments in various control systems design. Experiments involve the use of microcontroller and modern approaches in control system

EEEE4223 VLSI Systems Design 3 (3+0)

Prerequisite : None

This course covers system design procedure, basic circuit concept, scaling of integrated circuit and digital subsystem design. Practical considerations and issues on testability are discussed. Students are also exposed to computer aided design tools for designing VLSI circuits and systems

EEEE4224 Integrated Circuit Fabrication Technology 3 (3+0)

Prerequisite : None

This course covers semiconductor properties and process involved in the fabrication of integrated circuits which include crystal growth, doping of impurity atoms, formation of thin films, lithographic processes and packaging

EEEE4225 Microsystems and Sensors 3 (3+0)

Prerequisite : None

This course covers categorization, design and applications of sensors. Emphases are given on the sensors, fabrication process and the design of microsystem and sensors

EEE4226 Analog Integrated Circuit Design 3 (3+0)

Prerequisite : None

The course covers device models and basic circuits for analog integrated circuit design. Emphases are given on the analysis and design of amplifiers and various signal processing blocks

EEE4227 Testing and Reliability Engineering 3 (3+0)

Prerequisite : None

This course covers principles of production, productivity and product life cycle. Assembly of products, its quality control and analysis and principles of product reliability will also be discussed. Testing engineering which includes the principles of testability and design for testability is discussed

EEE4228 Advanced Semiconductor Devices 3 (3+0)

Prerequisite : None

This course covers semiconductor devices in the category of optoelectronics and high frequency devices such as microwave transistors, hetero-junction bipolar transistors, microwave tunnel diodes, microwave field effect transistors, transferred electron devices (TEDs) and avalanche transit-time devices. Topics such as device structure, principle of operation and typical characteristics are discussed

EEE4325 Power System Protection 3 (3+0)

Prerequisite : None

This course covers protective relaying, simple protective devices, instrument transformers, overcurrent, undervoltage, differential and distance protection. Substation automation techniques, protection signaling and pilot protection are also discussed. Overall protection of transmission lines, generators, transformers, motors and busbars are described

EEE3327 Electrical Power Generation and Utilisation 3 (3+0)

Prerequisite : None

This course covers methods of power generation including thermal, hydro, diesel, gas and nuclear power plants. The utilisation of electrical power in lighting, electrolytic process, electrical pulling and electrical heating are discussed

EEE4328 Industrial Drives 3 (3+0)

Prerequisite : None

The course covers analysis and design of electrical drives operation and control. It includes introduction of electrical drives and its dynamics as well as characteristics and control methods of variou types of motors such as direct current (DC), induction, synchronous and special motors

EEE4329 Power System Operation and Control 3 (3+0)

Prerequisite : None

The course covers the production and transfer of energy in power systems, flow of reactive power, and economic operation of power systems. For these, power system control methods, energy accounting on interconnected operations, communications in power systems, which include supervisory control and data acquisition (SCADA) system are discussed

EEE4321 Electric Power Quality 3 (3+0)

Prerequisite : None

This course covers definition of electric power quality, and sources of power quality problems such as voltage sags and interruption, transient overvoltages, harmonics, and long-duration voltage variations. Studies on wiring and grounding techniques to overcome power quality problems as well as method of monitoring of power quality are emphasised

EEE4423 Control System Design 3 (3+0)

Prerequisite : None

This course covers dynamic process and design of control system in time and frequency domains. Lyapunov stability analysis is introduced. Computer aided analysis and design are also introduced

EEE4424 Intelligent Control System 3 (3+0)

Prerequisite : None

This course covers various intelligent control system algorithms. Comparison between modern and classical control is outlined. Soft-computing techniques that mimic biological systems and human reasoning are introduced

EEE4425 Embedded Control System 3 (3+0)

Prerequisite : None

This course covers software and hardware for embedded system. Topics discussed include real time system concept and design, and embedded system design issues

EEE4426 Industrial Process Control 3 (3+0)

Prerequisite : None

This course covers principles of control, control types, basic elements for systems component, measurement, manipulation, processes characteristics, continuous process control and controller design. Practical applications of control system are emphasised in assignments

EEE4427 Multivariable Control Systems 3 (3+0)

Prerequisite : None

The course covers linear equations and matrices, continuous and discrete time state-space dynamic systems, controller and estimator design, optimal control and application of multivariable system. Practical applications of control system are emphasised in assignments

EEE4911 Industrial Training 5 (0+5)

Prerequisite : After completing 6 semesters

In this course, students will be exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized

EEE4947 Electrical and Electronic Systems Design Project 4 (0+4)

Prerequisite : None

The course covers electrical and electronic engineering oriented capstone design project for multi-disciplinary including the aspect of planning and executing project for conducting critical review, practice engineering ethics, market survey and cost analysis, prototype development and testing. Public health and safety, cultural, society, economy and environmental aspect are also emphasized

EE4949 Bachelor's Project 6 (0+6)

Prerequisite : Final Year Student

This course covers the aspects of planning and executing project. These include title selection, conducting critical review, designing and performing work strategy, collecting and analysing data, documenting and presenting project output

Department of Chemical & Environmental Engineering

ECH3101 Materials Science 3 (3+0)

Prerequisite : None

This course covers the introduction to the concept of molecules and bonding, properties and types of materials, and issues related to engineering and material sciences. The course encompasses on advanced materials and the issues of economy, society and environment

ECH3120 Chemical Engineering Thermodynamics 3 (3+0)

Prerequisite : EMM3213

This course covers the application of thermodynamics concepts as well as criteria and behaviors of substances in chemical engineering applications. Volumetric properties of pure substances, thermodynamics properties of various phases and chemical equilibrium concepts are discussed

ECH3121 Process Control and Instrumentation 4 (3+1)

Prerequisite : ECC3012 and ECH3119

This course covers the concepts and mechanisms of chemical process control and instrumentations which include process dynamics, process control instrumentations and design. Stability testing of a process control system is emphasized

ECH3114 Material Balance 3 (2+1)

Prerequisite : None

This course covers the chemical engineering principles and process industries. The calculation techniques, knowledge related to stoichiometry and chemical reactions in processes as well as the use of software in calculating material balances are emphasized. The course develops students' ability to design specific process and the processing plant

ECH3115 Energy Balance 3 (2+1)

Prerequisite : ECH3114

This course covers the chemical engineering principles and process industries. The calculation techniques, knowledge related to stoichiometry and chemical reactions in processes as well as the use of software in calculating material and energy balances are emphasized. The course develops students' ability to design specific process and the processing plant

ECH3116 Heat and Mass Transfer Processes 4 (4+0)

Prerequisite : None

This course encompasses the principles of heat transfer by conduction, convection and radiation as well as the procedure to design heat exchanger. Heat transfer processess involving boiling and condensation are included. Mass transfer process and phase equilibrium are discussed

ECH3117 Unit Operation 3 (3+0)

Prerequisite : ECH3114

This course covers the descriptions on mass transfer principles that occur in various phases. The conceptual design and methods of mass transfer unit operations are included

ECH3118 Physical Separation Processes 3 (3+0)

Prerequisite : None

This course covers the principle, operation and design of separation processess in chemical engineering. Material balances, heat and mass transfer processes and related engineering technologies are included

ECH3119 Numerical Method and Optimisation Process 3 (2+1)

Prerequisite : ECC3011

The course encompasses the concepts of numerical techniques and optimization process in chemical engineering problems by constructing algorithm using programming language. Concepts such as algorithm accuracy and stability as well as error and convergence analysis are introduced

ECH3201 Biochemical Engineering 3 (2+1)

Prerequsiite : None

This course covers the relationship and applications of biological system in biochemical engineering and related industries. The concepts of conventional biological systems and downstream processing are integrated with engineering design in the production of bioproduct

ECH3501 Pollution Control Engineering 3 (3+0)

Prerequisite : None

This course covers the principles of environmental engineering and related management aspects. The characteristics and types of pollutants, their effects to the environment and health and the required treatment methods are discussed

ECH3602 Safety and Risk Assessment 3 (3+0)

Prerequisite : None

This course covers the concept of safety and risk assessment in chemical plants. Awareness and knowledge related to accidents that can occur in industrial premises, the dangers of process materials, hazards identification and analysis techniques, and safety design are embedded

ECH3603 Project Development and Management 3 (3+0)

Prerequisite : None

This course covers the concepts of developing and managing a project. Factors such as costings, budgeting, monitoring the development levels of a project and identifying the availability of alternative projects are also emphasized. Malaysia Government Regulations on incentives, project development and management are also encompassed

ECH3604 Hazard and Operability Studies 3 (3+0)

Prerequisite : None

This course covers the knowledge on safety in the design and operations of plant and processes. Hazard and Operability Studies (HAZOP) is used as a method to identify deviations from processes or equipment, their respective causes and consequences. The roles, functions and integrities of the safety instrument are also evaluated

ECH3706 Process and Plant Design 4 (2+2)

Prerequisite : ECH3117

This course encompasses on chemical engineering plant design concepts that include process and equipment design, mechanical design and equipment selection. Safety evaluation, sensitivity analysis and engineering economic feasibilibity study are also emphasized

ECH3703 Plant Design Project 4 (0+4)

Prerequisite : ECH3706

The students are expected to produce a project proposal which is moderated by their supervisor. For each proposed project, the students must carry out the plant and equipment design, draw the detailed engineering drawings, conduct the economic analysis for the whole process, and prepare the safety frameworks for selected process and equipment

ECH3704 Chemical Engineering Reaction Kinetics 4 (0+4)

Prerequisite : ECH3114

This course covers the basic concepts in reaction kinetics and reactor design. Main contents discussed include types and analysis of reactors, design concepts of reactors for various systems and reaction systems with and without catalysts

ECH3705 Integrated Project 4 (0+4)

Prerequisite : ECH3115

This course encompasses the design of chemical engineering operation unit using software packages. The application of chemical engineering principles including mass and energy balance analysis, separation process principles and costing

analysis are emphasized

ECH3902 Chemical Engineering Laboratory I 1 (0+1)

Prerequisite : None

This course covers the basic applications of chemical engineering fundamentals related to fluid mechanics and thermodynamics. Measuring, recording and analyzing data as well as manipulating experimental parameters are emphasized

ECH3903 Material Engineering Laboratory 1 (0+1)

Prerequisite : None

This course covers the operating methods for analytical equipment that are used to do material analyses and characterizations. Methods used to calibrate equipment are also conducted

ECH3904 Chemical Engineering Laboratory II 1 (0+1)

Prerequisite : ECH3902

This course covers the heat and mass transfer phenomena that occur in various chemical engineering unit. Measuring, recording and analyzing data as well as manipulating experimental parameters are also emphasized

ECH3905 Chemical Engineering Laboratory III 1 (0+1)

Prerequisite : ECH3904

This course covers the analyses on mass separation phenomena occurs in chemical engineering unit operations. Chemical reactions that occur in various reactors are encompassed

ECH3907 Computer Aided Chemical Engineering Drawing 2 (0+2)

Prerequisite : None

This course covers the use of computer aided engineering drawing techniques for basic chemical engineering drawings. Identification and sketching of piping system and accessories are emphasized. The course covers basic engineering drawings in 2D and 3D

ECH4901 Industrial Training 5 (0+5)

Prerequisite : After completing 6 semesters

In this course, students are exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied beforehand on current practices at the workplace. Problem solving and communication skills are also emphasized

ECH4949 Bachelor's Project 6 (0+6)

Prerequisite : Final Year Student

This course covers the aspects of planning and executing project. They include selecting title, conducting critical review, designing and performing work strategy, collecting and analysing data, documenting and presenting project output

ECH4201 Recovery Processes 3 (3+0)

Prerequisite : None

This course covers the concept of recovery and product purification from technology and engineering perspectives. The principles, operations and applications of downstream processings, recovery processes, purification operations and product polishing processes are emphasized

ECH4202 Bioreactor Engineering Design 3 (3+0)

Prerequisite : None

This course covers the design concepts, operations of bioreactor and the support system. The application of transport phenomena principles that encompass on heat and mass transfer is elucidated

ECH4203 Fermentation Technology 3 (3+0)

Prerequisite : None

This course covers the topics on fermentation technology and its applications in product formation, strain development and cell culture process. Elements related to the economy of the processes and products combined with future development strategies are also covered

ECH4204 Pharmaceutical Engineering 3 (3+0)

Prerequisite : None

This course covers the fundamental of pharmaceutical engineering including the physical and chemical properties of pharmaceutical products, the pharmaceutical plant and process design, as well as the quality assurance and compliance of pharmaceutical plant and its products

ECH4205 Product Design and Safety 3 (3+0)

Prerequisite : None

This course covers the concepts in product design that emphasizes on the roles of ideas, customer needs, selection criteria and process development in product manufacturing. Product safety aspects related to acts, standards, halal issues and testing methods are discussed

ECH4303 Petroleum and Natural Gas Engineering 3 (3+0)

Prerequisite : None

This course covers the policy and overall perspective of the position of petroleum and gas industry in the current economics trend. Detailed descriptions on the feedstocks, products, processing techniques, transportation and transmission of petrolea, natural gas and the associated products from the source to the consumers are discussed

ECH4304 Advanced Fluid Mechanics for Chemical Engineers 3 (3+0)

Prerequisite : EMM3305

This course covers the advanced chemical engineering fluid mechanics methods. Descriptions and analyses on boundary layer phenomena, fluid flows, approximations of Navier-Stokes equation as well as computational methods are emphasized

ECH4305 Process Design and Integration 3 (3+0)

Prerequisite : ECH3116

This course covers the chemical process integration concepts, concepts of pinch technology, the designs of major unit operations networks and the utility system networks in the processing plants

ECH4306 Process and Product Engineering 3 (3+0)

Prerequisite : None

This course covers the aspects on product development, processing and manufacturing. Elements that are emphasized include provision of targeted product specification, manufacturing and processing of products, synthesis of specialty fine chemicals and economic analysis

ECH4308 Advanced Process Control 3 (3+0)

Prerequisite : None

This course covers the design and implementation of advance process control concepts with the emphasis on methods and techniques that have had significant impact on industrial practices. Multi-Input-Multi-Output systems, digital control system, advance modelling techniques, model predictive control and artificial intelligence techniques are emphasized

ECH4401 Polymer Engineering 3 (3+0)

Prerequisite : None

This course covers the concepts of polymer engineering that include the syntheses, properties, characterizations, processings and applications of polymers and copolymers. Entrepreneurship opportunities in polymer engineering field are discussed

ECH4402 Particle Technology 3 (3+0)

Prerequisite : None

This course covers the theory and equipment design technique for particle processing, storage and transportation. The characteristics, properties and behaviours of solid particles at various conditions are deliberated

ECH4404 Nanomaterials Processing 3 (3+0)

Prerequisite : None

This course covers the synthesis and processing concept of nanoparticles and nanomaterials. Relationship between the growth methods with the properties and characteristics of the nanomaterials are included. The application of nanomaterial as smart material is discussed

ECH4405 Electrochemical Engineering 3 (3+0)

Prerequisite : None

This course covers the principles of process and engineering design of electrochemical cells. The transport processes and chemical reactions in the electrochemical cells as well as various types of application of electrochemistry in industries are elucidated

ECH4406 Materials Analysis 3 (3+0)

Prerequisite : None

This course covers the theoretical aspects and analytical techniques used for physical and chemical characterization of materials. The principles and operations of the analytical equipment, sample preparation methods and calibration procedures are included

ECH4501 Management and Utilisation of Waste 3 (3+0)

Prerequisite : None

This course covers the description and discussion on environmental regulation and waste management. The characteristics of various wastes, waste management techniques and its disposal methods as well as alternatives technologies through reuse concepts are explained

ECH4503 Air Pollution Engineering 3 (3+0)

Prerequisite : None

This course covers the discussion on air pollutions. Acts and regulations related to environment, effects of pollutants on human and surroundings as well as methods used to measure and control the air pollution rate are the main focus

ECH4504 Solid Waste Engineering 3 (3+0)

Prerequisite : None

This course covers various aspects related to the different types and methods in handling the municipal solid waste. The importance of regulations and acts as well as solid waste management through various techniques are included

ECH4505 Green Engineering 3 (3+0)

Prerequisite : None

This course focuses on the sustainable development and green engineering. Emphasis is on green design concepts that evaluate risks, life cycle analysis and application of building blocks in green design

ECH4506 Renewable Energy 3 (3+0)

Prerequisite : None

This course covers various technologies to generate renewable energy. Governmental policies and incentives, environmental, economical and geographical elements are elucidated

ECH4507 Water Engineering 3 (2+1)

Prerequisite : None

This course covers various important aspects in water engineering. Processes and procedures for water treatment as well as evaluation and determination of water quality are conducted. Compliances to water standards are discussed

ECH4508 Wastewater Engineering 3 (3+0)

Prerequisite : None

This course covers the waste water pollutants, pollution control and its treatment methods. Sewage treatment and disposal methods as well as waste water reusage are discussed

ECH4509 Toxic and Hazardous Waste Management 3 (3+0)

Prerequisite : None

This course covers the aspects related to toxic and hazardous wastes management and its monitoring. The comprehensive waste management concepts and relevant laws are elucidated. Case studies on mismanagement of toxic and hazardous wastes and the impacts are discussed

Department of Computer and Communication Systems Engineering

ECC3005 Computer Programming 3 (2+1)

Prerequisite : None

This course covers an introduction to computer organization, problem solving techniques and program development. It emphasizes on good programming practice. Selection and control structures, functions, arrays, dynamic memory allocation, strings and files are also discussed

ECC3011 Engineering Mathematics I 3 (3+0)

Prerequisite : None

This course covers functions, complex numbers, matrices, sequences and series, limits and continuity, differentiation, and integration. Among the topics discussed include various types and characteristics of functions, concepts of complex numbers, matrices, sequences and series, and various techniques for differentiation and integration for various engineering applications

ECC3012 Engineering Mathematics II 3 (3+0)

Prerequisite : None

This course covers ordinary differential equation, Laplace Transform, and partial differential equation. Emphasis given includes solving ordinary and partial differential equations using numerical methods and Laplace Transform

ECC3013 Engineering Mathematics III 3 (3+0)

Prerequisite : ECC3012

This course covers complex functions, vector calculus, Fourier series and Fourier Transform for various fields of engineering applications. Emphasis given includes mapping, differentiation of complex functions, complex series and contour integration, Fourier series expansion as well as Green, Gauss and Stoke theorems.

ECC3014 Engineering Statistics 3 (3+0)

Prerequisite : None

This course covers the fundamental of statistics, elements of probability theory, random variables, sampling theory, hypothesis testing and linear regression, and correlation. Emphasis given includes discrete distribution, continuos distribution and also confidence interval for the mean and variance

ECC3112 Engineering Algorithms 4 (3+1)

Prerequisite : ECC3005

This course covers a systematic study of algorithms in engineering problems. This includes the algorithm analysis, data structure, fundamental algorithms for sorting and searching, hashing, graphs and algorithm design an optimization

ECC3113 Digital Communications 4 (3+1)

Prerequisite : ECC3120

This course covers the transmission and reception of data by means of digital techniques. This includes modulation techniques, diversity and Multiple Input Multiple Output (MIMO), source coding, channel coding and detection

ECC3114 Feedback Control For Computer Systems 3 (3+0)

Prerequisite : None

This course covers the feedback control in computer systems. Emphasis on the feedback, stability and uncertainty techniques of computers systems are also given

ECC3115 Electric Circuit Analysis 4 (3+1)

Prerequisite : None

This course covers basic concepts of electrical circuit and electrical circuit analysis, which include capacitive, inductive, resistorcapacitor and resistor-inductor circuits, alternate-current analysis, three phase circuit as well as two-port network. First-order resistorinductor and resistor-capacitor circuits, and power calculation of alternate current circuits are also emphasized

ECC3116 Digital Logic 4 (3+1)

Prerequisite : None

This course covers three main elements related to digital logic, which are the fundamentals of digital logics, their operations and applications. Digital operation covers basic operation, logic simplification and the design of combinational logic. The logic system applications include flip-flops and clock circuitry, digital arithmetic, counters and registers, Medium Scale Integrated (MSI) and Large Scale Integrated (LSI) logic circuits, integrated logic families, and method of interfacing between integrated circuit logic families and the analog system

ECC3117 Electronic Devices and Circuits 4 (3+1)

Prerequisite : ECC3110

The course covers methods of analyzing and designing simple electronic circuits. An overview of semiconductors and p-n junctions, devices like junction diodes, bipolar junction transistor and field effect transistor are studied together with simple circuits

ECC3118 Microprocessor 4 (3+1)

Prerequisite : ECC3116

This course covers microprocessor architecture, bus, memory system and assembly language programming. Interfacing with peripheral devices, interrupt system and current microprocessors are also discussed

ECC3119 Electronic Communication Circuits 4 (3+1)

Prerequisite : ECC3117

This course covers main elements in the analogue electronic communication system which emphasizes various types of transmission and reception circuits. Signal and noise, amplitude and frequency modulations as well as Single Sideband (SSB) communications circuit are also discussed

ECC3120 Signals and Systems 3 (3+0)

Prerequisite : ECC3013

This course covers methods based on mathematical functions for developing and analyzing various signals and systems in the field of computer and communication systems engineering. This course takes into account the time and frequency domains using Fourier transform, Laplace and Z

ECC3121 Electromagnetic Waves 3 (3+0)

Prerequisite : ECC3013

This course covers an introduction on the important concepts of physical and mathematical method used in all wave phenomena. It also explains the concept of static and varying electromagnetic fields in free space and in materials with some of their applications. Calculations of simple electromagnetic waves and fields are also explained

ECC3204 Computer Architecture 3 (3+0)

Prerequisite : ECC3118 / EEE3132

This course covers general architecture and organization of computer. This includes basic components and functions involved in computer processes. Emphasis is also given on development and differences between various modern computer systems

ECC3205 Operating Systems 3 (3+0)

Prerequisite : ECC3204

This course covers the principles of modern operating systems including process management, file system, memory management, kernel and device drivers. The issue of deadlock and techniques to handle it are elaborated. Security concepts pertaining to operating systems are discussed. Multi-core and multi-processor operating system issues are also discussed

ECC3303 Embedded Systems Design 3 (2+1)

Prerequisite : ECC3118

This course covers the main elements of embedded systems design. Emphasis given includes hardware and firmware design, hardware selection, hardware testing, development tools and software,

firmware development and firmware debugging. Project management elements such as project initiation, planning, cost, management, and implementation of the project are applied in the development of embedded systems projects

ECC3304 Digital Systems Design 4 (3+1)

Prerequisite : ECC3116

This course covers design and analysis of synchronous and asynchronous sequential systems using Field Programmable Gate Array (FPGA) devices. Emphasis given includes implementation technologies, Hardware Description Language (HDL) aspects, simulation, synthesis and digital system testing

ECC3401 Digital Signal Processing 3 (3+0)

Prerequisite: ECC3120

This course covers the fundamental principles and applications of digital signals and systems as well as various Discrete Fourier Transform and Z-Transform. Emphasis on design techniques and digital filter analysis are also given. This course also covers a discussion on engineering applications using digital signal processing

ECC3404 Multimedia Systems 3 (2+1)

Prerequisite : ECC3005 / EEE3123

This course covers basic characteristics and development of multimedia systems. Emphasize given among others are audio, image, video, graphics, text, multimedia compression technique and synchronization

ECC3603 Optical Communications 4 (3+1)

Prerequisite : None

This course covers the physical layer issues of optical communication links including optical fiber elements and functions. Optical communication system designs are emphasized

ECC3702 Computer Networks 4 (3+1)

Prerequisite : None

This course covers the main principles and technology in computer networks. It comprises data link layer, network, transport and application layers in the context of connection performance and reliability

ECC3904 Seminar 1 (0+1)

Prerequisite : None

This course covers seminar activities involving industries and government agencies related to computer and communication technologies. Matters pertaining to entrepreneurship, leadership, and professional ethics are emphasized

ECC4911 Industrial Training 5 (0+5)

Prerequisite : After completing 6 semesters

In this course, students will be exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized

ECC4947 Computer and Communication Systems Design Project 4 (0+4)

Prerequisite : None

The course covers computer and communication systems engineering oriented capstone design project for multi-disciplinary. Design processes involving market study, project planning and execution, modelling and simulation, cost analysis, prototype development and testing are discussed. Aspects of public health and safety, culture, society, economics, and environment are emphasized

ECC4949 Bachelor's Project 6 (0+6)

Prerequisite : Final Year Student

This course covers the aspects of planning and executing project. These include title selection, conducting critical review, designing and performing work strategy, collecting and analysing data, documenting and presenting project output

ECC4208 Advanced Programming 3 (3+0)

Prerequisite : ECC3005

This course covers professional programming methods based on object-oriented programming for application development. Emphasis is given on multithreading, networking, database connectivity, remote object and socket programming. The development of mobile application is also discussed along with the example of applications

ECC4207 Web and Database 3 (3+0)

Prerequisite : ECC3005

This course covers internet programming language which include Hypertext Markup Language (HTML) and cascading Style Sheet (CSS). Client-server programming techniques are also elaborated. This course also covers database concepts, relational models of database, query languages and processing. Designing and security aspects of database are also discussed

ECC4209 Computer System Administration 3 (3+0)

Prerequisite : ECC3205

This course covers the essentials of modern system administration. This includes storage management and disaster recovery, users and groups management, network access and server security, file sharing and document management, server virtualization and cloud computing, performance monitoring and optimization, configuration management and system automation

ECC4306 Artificial Intelligence 3 (3+0)

Prerequisite : ECC3112

This course covers the principles and basic theory of artificial intelligence including different methods such as fuzzy logic, neural network and genetic algorithm. It also discusses the applications of the artificial intelligence method in various fields as well as formulation of problem and assessment of artificial intelligence

ECC4307 Autonomous Robots 3 (3+0)

Prerequisite : EEE3132/ECC3118

This course covers introduction to robot, sensor, measurement and perception, object location, manipulator position, manipulator movement, task planning and robotics learning. Robot programming, movement and appliactions are also discussed

ECC4305 System-On-Chip 3 (3+0)

Prerequisite : None

This course focuses on the hardware-software co-design strategies for system-on-chip (SoC). This includes the co-design methodologies, control and data flow, hardware - software partitioning, intellectual

property (IP) core integration, implementation strategies, functional verification and performance evaluation and case study of a real SoC design

ECC4403 Imaging System 3 (3+0)

Prerequisite : ECC3403

This course focuses on principles of human vision, image sensors, image displays, elements of a digital image processing system and compression used in image and video system. Digital image processing concepts in time domain and frequency domain as well as the application of digital image processing in various fields are also discussed

ECC4505 Mobile Radio and Satellite Communications 3 (3+0)

Prerequisite : ECC3113

This course covers mobile radio system, cellular mobile radio design, technology and applications of satellite communication, design techniques of cellular system architecture and mobility management.

Orbital system satellite and its calculation for propagation as well as link budget for satellite system are also explained

ECC4508 Antenna and Propagation 3 (3+0)

Prerequisite : ECC3121

This course covers the theory and principle of designing different types of antenna, antenna measurement techniques and on the propagation of waves as well as techniques to design few types of antenna. Wave propagation model and its parameter are aslo explained

ECC4506 Access Network Technologies 3 (3+0)

Prerequisite : None

This course covers access network technologies including wireless, wired, fiber optic, radio-over-fiber and free space optic. Architecture mobile access technology planning are also discussed

ECC4507 Radio Frequency and Microwave Techniques 3 (3+0)

Prerequisite : ECC3121/ EEE3109

This course covers the theory, analysis and design of transmission lines, microwave such as S-Parameter, Smith chart, propagation along the transmission lines and impedance matching techniques. This course also explain types of transmission line and its calculation by using theoretical method and Smith chart. The importance of matching network and its calculation is explained at the end of the course. With this knowledge, this course prepares students for more advanced environment in communication technology

ECC4602 Photonic Devices 3 (3+0)

Prasyarat : ECC3603

This course covers the main devices of photonic technology which emphasizes various applications particularly in the field of communications. Emphasis given includes basic operation, characteristics, design, and applications for each devices

ECC4706 Core Network Technologies 3 (3+0)

Prasyarat : ECC3603

This course covers various technologies and systems used in the core networks . Topics discussed include digital core networks, transmission media, legacy technology, standard for SDH, IP based core networks and MPLS. Designs of the advanced core network technologies are also discussed

ECC4705 Internet of Things (IoT) 3 (3+0)

Prerequisite : None

This course covers the subject of Internet of Things (IoT) as a paradigm to connect a myriad of objects or things that enables intelligent environments and applications. It covers communications between machines and man, and between machines and machines including the protocol stack, communications infrastructure, security and devices. Applications development is discussed and concluded with the illustration of IoT applications

ECC4707 Computer and Network Security 3 (3+0)

Prerequisite : ECC3205

This course covers the topics on computer and network security as well as techniques of encryption and decryption. Operating system, program, network and database securities as well as advanced security techniques are also discussed

Department of Mechanical and Manufacturing Engineering

EMM3122 Engineering Materials I 2 (2+0)

Prerequisite : None

This course covers the engineering materials with the emphasis on mechanical and physical properties of materials. In addition, this course discusses alloy solidification, phase diagrams, heat treating metal alloys, non-metallic materials, failure in ferrous materials, corrosion and metal protection and material examination techniques

EMM3126 Introduction to Programming Language 3 (1+2)

Prerequisite : None

This course covers the applications of computer programming principles with programming tools and high level programming languages for solving mechanical engineering problems. Topics are including the structure of the program, various calculative equations, data arrays, data analysis methods, microprocessors programming, graphical user interface, and modelling and simulation

EMM3103 Statics 3 (3+0)

Prerequisite : None

This course covers the basic concepts, theories and methods of solving static problems. Emphasis given on scalar and vector, force system, equilibrium of particle, equilibrium of rigid body, structural analysis, friction and centroid and moment of inertia

EMM3105 Dynamics 3 (3+0)

Prerequisite : None

This course covers basic concept, theories and methods to solving dynamics problems with emphasis on the planar kinematic and kinetics of a particle, and rigid bodies

EMM3132 Applied Engineering Mathematics And Statistics 3 (2+1)

Prerequisite : None

This course covers complex variables functions, vector calculus, sampling theory and linear regression and correlation. Emphasis given includes mapping, Fourier series expansion, sampling distribution and also confidence interval for the mean and variance

EMM3213 Thermodynamics I 3 (2+1)

Prerequisite : None

This course covers the basic concepts, theories and methods of solving problems related to thermodynamics. Topics discussed are the first law of thermodynamics, non-flow processes, flow processes, flow processes in practice, the second law of thermodynamics and corollaries of the second law

EMM3214 Thermodynamics II 3 (3+0)

Prerequisite : None

This course covers the basic concepts, theories and methods of solving applied thermodynamics problems with the emphasis on gas and vapor power cycles in internal combustion engine and gas turbine power plant. The concept of heat transfer is also discussed fundamentally. Application to reversed Carnot cycle in heat pump, refrigeration and the mechanisms of air-conditioning system and cooling tower

EMM3218 Heat Transfer 3 (3+0)

Prerequisite : None

This course covers the basic concepts, theories and methods of solving problems related to heat transfer. Emphasis is given to heat transfer by conduction, convection and radiation

EMM3305 Fluid Mechanics I 3 (3+0)

Prerequisite : None

This course covers the theory of fluid mechanics with emphasis on static, kinematics and fluid dynamics as well as introduction of pump and turbine. It also discusses the energy equation, pressure, momentum due to the fluid flow, dimensional analysis, flow in pipes and boundary layer theory

EMM3306 Fluid Mechanics II 3 (3+0)

Prerequisite : None

This course covers the study of differential analysis of fluid flow, approximate solution of the Navier-Stokes equation, compressible flow and turbomachinery. It also covers the lubrication application and an introduction to Computational Fluid Dynamics (CFD).

EMM3409 Strength of Materials I 3 (3+0)

Prerequisite : None

This course covers the basic concepts, theories and methods for solving strength of materials problems with emphasis on the mechanical properties of materials, tensile, compression, bending, torsion and stress. In addition, the course also discusses the uniaxial pressure, beam deflection and transformation of stress and strain

EMM3410 Strength of Materials II 3 (3+0)

Prerequisite : None

This course covers detail concepts, theories and methods for solving strength of materials problems with the emphasis on the bending, buckling, torsion of non-circular shaft and thermal stresses. It also discusses the failure of fracture, fatigue, creep and stress application plane

EMM3507 Engineering Design I 3 (2+1)

Prerequisite : None

This course covers the basic concepts of machine component design from the load identification stage, shaft, bearing until the assembly stage. It also emphasizes the importance of patents and intellectual property in terms of the law and filing process

EMM3509 Engineering Design II 3 (1 + 2)

Prerequisite : None

This course covers the design of the power transmission system components with the emphasis on sustainable design methods. Computer aided engineering (CAE) will be introduced fundamentally. Students will be given a project in which students need to take into account all aspects of design components

EMM3518 Computer Aided Engineering Drawing 3 (1+2)

Prerequisite : None

This course is an introduction to engineering drawings with greater emphasis on practicality. It includes engineering drawings using a variety of tools, techniques, sketching, geometric construction, multiview projections and auxiliary views, pictorial projections, intersection, dimensioning and tolerancing (GDT) and the working drawings in 2D and 3D using computer-aided drawing (CAD). The course also emphasizes the international standards and conventions used by engineers

EMM3520 Instrumentation And Control 3 (3+0)

Prerequisite : None

This course covers the concepts and methods of instrumentation and control with emphasis on constructing appropriate system models. In addition, it also identifies effective instrument selection, stability analysis and improvement of the control system

EMM3524 Mechanics of Machines 3 (3+0)

Prerequisite : None

This course introduces the type of mechanism that normally exist in machine structure. It covers the basic concepts, theories and methods for solving mechanics of machines problems with the emphasis on kinematics and kinetic of machinery

EMM3526 Computer Aided Engineering 3 (2+1)

Prerequisite : None

This course covers the basic concepts and theories related to Computational Fluid Dynamics (CFD) and Finite Element Method (FEM). Emphasis is given to the use of CFD and FEM software to solve engineering problems. Students will be exposed on the use of Computer Numerical Control (CNC) machines, which covers part of the Computer Aided Manufacturing (CAM)

EMM3528 Mechanical Vibration 3 (3+0)

Prerequisite : None

This course covers the fundamental study of undamped and damped vibration system, free and forced vibrations of one degree of freedom system, vibration isolation, and transient vibration. In addition, this course also covers the study of vibration system with two or more degrees of freedom, properties of vibrating systems such as orthogonality and modal matrix, Lagrange‟s Equation, analysis of continuous systems and random vibrations

EMM3610 Engineering Economic Analysis 3 (3+0)

Prerequisite : None

This course covers the systematic evaluation of the costs and benefits associated with engineering projects. It covers concepts such as the time value of money, methods of discounted cash flow and financial decision making within engineering environment

EMM3612 Engineering Project Management 3 (3+0)

Prerequisite : None

This course covers the aspects of project management in organization and the correct leadership techniques. It includes procedures to initiate the project, planning and scheduling methods, developing the network, identifying the critical path, project control and closure

EMM3614 Industrial Health and Safety 3 (3+0)

Prerequisite : None

This course covers the concepts and methods of safety and health in the industry. Emphasis are given on the sources of hazards and ist control and solutions

EMM3706 Production Planning And Automation System 3 (3+0)

Prerequisite : None

This course covers the concept of production planning and automation in the industry that includes automatic machines and automated production lines. In addition, it also describes on storage system, forecasting, aggregate planning, material resource planning and capacity planning

EMM3707 Manufacturing System Design 3 (3+0)

Prerequisite : None

This course covers the components and manufacturing systems for discrete and continuous product. Topics to be discussed include the role of the manufacturing industry, manufacturing strategy, manufacturing systems, flexible manufacturing systems, quality and manufacturing system modeling and the latest manufacturing system

EMM3722 Manufacturing Technology And Processes 3 (3+0)

Prerequisite : None

This course covers the concepts and applications of manufacturing processes in the manufacturing industry. It includes formation process of metallic and non-metallic materials

EMM3806 Mechanical Engineering Laboratory I 1 (0+1)

Prerequisite : None

This course covers the experimental investigations and application of concepts which are related to field of Engineering Materials, Strength of Materials and Statics. It provides an introduction to the selection of materials, mechanical properties of materials, measuring stress and strain and rigid body balance

EMM3808 Mechanical Engineering Laboratory II 1 (0+1)

Prerequisite : None

This course covers the experimental investigations and application of concepts which are related to field of Fluid Mechanics, Thermodynamics and Strength of Materials. It provides an introduction to properties of fluid, solid and gas, the use of Bernoulli's principle, pressure and balance, torsion and stress

EMM3810 Mechanical Engineering Laboratory III 1 (0+1)

Prerequisite : None

This course covers the experimental investigations and application of concepts which are related to field of Fluid Mechanics and Thermodynamics. It provides an introduction to the properties fluid flow, turbines and pumps, bomb calorimeter, air-conditioning and refrigeration cycle, combustion and operation of engines

EMM3812 Mechanical Engineering Laboratory IV 1 (0+1)

Prerequisite : None

This course covers the practical and the application of concepts which are related to field of Manufacturing Technology and Processes, Heat Transfer and Mechanics of Machines in solving engineering problems. It provides an introduction to the techniques of welding, molding, injection techniques, heat transfer, static and dynamic balance, vibration, torque, gear system, gyroscopes and a swirling shaft rotation

EMM3814 Mechanical Engineering Laboratory V 1 (0+1)

Prerequisite : None

This course covers the practical and the application of concepts which are related to field of Instrumention and Control and Production, Planning and Automation System in solving engineering and design problems. It provides an introduction to measurement systems, control systems, pneumatic, electro-pneumatic and hydraulic

EMM4911 Industrial Training 5 (0+5)

Prerequisite : After completing 6 semesters

In this course, students will be exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized

EMM4947 Mechanical Engineering Design Project 3 (0+3)

Prerequisite : None

This course covers the integrated design of mechanical engineering in multidisciplinary orientation. Design processes involving market study, project planning and execution, modelling and simulation, cost analysis, prototype development and testing are discussed. Aspects of public health and safety, culture, society, economics, and environment are emphasized

EMM4949 Bachelor's Project 6 (0+6)

Prerequisite : Final Year Student

This course covers the aspects of planning and executing project. These include title selection, conducting critical review, designing and performing work strategy, collecting and analysing data, documenting and presenting project output

EMM4209 Internal Combustion Engine 3 (3+0)

Prerequisite : None

This course covers introduction to internal combustion engine with the emphasis on the engine cycle, fuel, fuel production and air pollution. Additional topics include cooling system and lubrication system

EMM4212 Building Environment And Services 3 (3+0)

Prerequisite : None

This course covers basic buiding services for a building that encompass the knowledge from mechanical engineering descipline. Topics to be discussed include utilities, air conditioning, fire fighting, transportation, maintenance and green technology

EMM4303 Tribologi/ Tribology 3 (3+0)

Prerequisite : None

This course covers the concepts and methods related to the friction, wear and lubrication. It also discusses the theory of friction, surface analysis, the properties of tribology, tribology unit, the friction of solid materials, the properties of lubricant and lubrication regime

EMM4405 Fabrication and Characterization of Composite Materials 3 (3+0)

Prerequisite : None

This course covers the fabrication and characterization of composite materials with the emphasis on polymer matrix composites, metal matrix, ceramic matrix and composite materials testing. The course also includes natural fibre composites, joints of composite materials, nanocomposites, recycles of composite materials and the uses of composites

EMM4412 Total Quality Control 3 (3+0)

Prerequisite : None

This course evaluates advanced materials like ceramic, composite, electronic, nano material, polymer etc that can be used in various applications such as mechanical, aerospace, manufacturing and medical. In addition, this course studies materials selection, economic issues, environment and society in materials science and engineering

EMM4509 Robot Dynamics 3 (3+0)

Prerequisite : None

This course covers the kinematics, dynamic analysis and force of robot manipulator arm with emphasis on constructing appropriate transformation matrix. Trajectory planning to control movement of robot manipulator is emphasized

EMM4512 Finite Element Method In Engineering Analysis 3 (3+0)

Prerequisite: None

This course include analysis various problems in engineering using finite element method. It covers mathematical model, finite element method formulation, finite element of various dimensions, pre and post processing, linear structure, thermal-fluid and nonlinear structure application

EMM4607 Total Quality Control 3 (3+0)

Prerequisite : None

This course covers the concepts and methods of controlling the quality of goods, services and processes. Topics to be discussed include the quality and competitiveness, the basis of improved quality, control charts, sampling, processing, design of experiment, reliability and application of control charts

EMM4608 Industrial Management 3 (3+0)

Prerequisite : None

This course covers the methods of industrial management for individual and group. Topics to be discussed are the concept of management, planning, control, organization, motivation, work performance and project management

EMM4711 Tool Engineering 3 (3+0)

Prerequisite: None

This course covers the elements of tooling engineering and variety of processes used to design and fabricate moulds and dies for plastic and metal products. Topics to be discussed include the tools selection, component systems in plastic injection moulding and sheet metal working, and the latest technology in rapid tooling

EMM4713 Operations Research 3 (3+0)

Prerequisite : None

This course covers the concepts and methods with emphasis on the construction of linear model to achieve optimum results in operations research, linear programming model, transhipment problems and tasks

EMM4715 Powder Metallurgy 3 (3+0)

Prerequisite : None

This course covers the whole process of manufacturing powder metallurgy to produce powder compact component. Emphasis given on powder properties, powder compaction, sintering, post sintering treatment and design consideration

EMM4718 Human Responses To Vibration 3 (3+0)

Prerequisite : None

This course covers the fundamental study of human responses to vibration. It emphasizes on the basic concepts of whole-body vibration, vibration discomfort, hand-transmitted vibration, and health effects of vibration on human. In addition, this course also focuses on the whole-body biodynamics, biodynamics of human hand, and the method of measuring the level of vibration exposure on the human body and hands

Department of Process and Food Engineering

EPF3001 Statics and Strength of Materials 2 (2+0)

Prerequisite : None

This course covers the basic concepts, theories and methods of solving mechanics problems involving materials using the konsep of mechanics of solid materials. Emphasis is given on the implementation of algebra and vector calculus to solve problems related to force system, structural analysis, unaxial and biaxial

EPF3104 Food and Process Engineering Laboratory I 1 (0+1)

Prerequisite : None

This course covers practicals on the characterization of engineering properties of biological materials, basics of fluid mechanics, physical unit operations and strength of materials related to food processing operation and system

EPF3105 Food and Process Engineering Laboratory II 1 (0+1)

Prerequisite : None

This course covers practicals on heat and mass transfer operations happened and related to food processing operation and system

EPF3106 Food and Process Engineering Laboratory III 1 (0+1)

Prerequisite : None

This course covers practicals on process control, instrumentation and simulation, as well as bioreactor system, packaging, membrane separation, freeze drying and distillation for various food processing applications

EPF3107 Microbiology and Safe Food Processing 3 (3+0)

Prerequisite : None

This course covers principles and practices of food safety and safe processing of foods. The teaching focuses on appropppriate approach to control biological, chemical and physical hazard contaminants. The student is also given the opportunity to analyze hazard during the case study

EPF3108 Mass and Energy Balance 3 (3+0)

Prerequisite : None

This course introduces basic principles of calculations in process and food engineering. It covers the basic concepts, the use of various process variables and balance calculations related to food processing.

EPF3109 Numerical and Computer Methods 3 (3+0)

Prerequisite : ECC3012

This course covers an introduction to algorithmic and numerical solution of engineering problems. Emphasize is given on applications and implementing numerical methods with application software. The student is required to apply common numerical methods for solving nonlinear equations, system of linear equations, curve fitting, interpolation, numerical differentiation, numerical integration, ordinary and differential equations

EPF3202 Food Engineering Unit Operations 3 (3+0)

Prerequisite : None

This course covers the concept of unit operations related to physical properties of food engineering. This course involves understanding the correlations of heat transfer, mass transfer and equipment design

EPF3203 Separation Process 3 (3+0)

Prerequisite : None

This course covers the principles and design of separation unit operations. The student is introduced to the separation operation and design of separation unit operation equipments including for food and bio materials

EPF3304 Process Control 3 (3+0)

Prerequisite : None

This course covers the basic consept in process control and instrumentation process engineer. It encompasses types of control, selection of suitable control mode based on objective and process, control analysis as well as computer simulation

EPF3501 Waste Treatment and Utilisation 3 (3+0)

Prerequisite : None

This course covers the basic principles of waste treatment and utilization, Emphasis is also given on wastes pollution control for food, biological and post- harvest in industrial and agricultural sector

EPF3502 Occupational Safety And Health In Processing Industries 3 (3+0)

Prerequisite : None

This course covers the principles and practices of occupational safety and health. Emphasis given include in the context of Malaysian legal requirements, their relation to the industry and their effects to the safety and health of the workers, nearby communities and others who are impacted by the workplace environment

EPF3603 Engineering Properties of Biological Material 2 (2+0)

Prerequisite : None

This course covers the importance of engineering properties based on various physical properties of biological materials. It emphasizes on application of engineering properties in handling processing and storage structures. It also relates the importance of engineering properties on the analysis and design of various bio-material process and food engineering systems

EPF3701 Packaging Engineering 3 (3+0)

Prerequisite : None

This course covers the functions, design concepts, materials and equipments in packaging. Emphasis given also includes descriptions of the packaging quality control in context of Malaysian and international standards

EPF3801 Reaction Kinetics and Reactor Design 3 (3+0)

Prerequisite : None

This course covers various types of reactors design. This includes batch and recycle, analysis for non-ideal reactor, and biological system reaction

EPF4001 Production and Operation Management 3 (3+0)

Prerequisite : None

This course covers the basic theories and concepts on managing and planning projects and operations. Emphasis is given on the design strategy and analysis until financial planning

EPF4911 Industrial Training 5 (0+5)

Prerequisite : After completing 6 semesters

In this course, students are exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized

EPF4949 Bachelor's Project 6 (0+6)

Prerequisite : Final Year Student

This course covers the aspects of planning and executing project. These include title selection, conducting critical review, designing and performing work strategy, collecting and analysing data, documenting and presenting project output

EPF4601 Plantation Crops Processing 3 (3+0)

Prerequisite : None

This course covers the introduction, harvesting, processing methods, fruits handling, quality control and productions of products from the main plantation crops in Malaysia, It also includes the plasntation crops such as palm oil, rice, rubber, tea, cocoa, pineapple, black pepper, coffee and coconut

EPF4602 Bio-Material Polymer Technology 3 (3+0)

Prerequisite : None

This course covers the technology of bio-material polymer processing, standard test, bio-material polymer characteristics, processing and its application in life. Amongst the topics discussed are types of bio-material polymer, polymerization techniques, polymer molecule, chemical-physical, rheological and thermal characteristics, operation analysis, bio-material polymer processing and easily degradable material

EPF4605 Pharmaceutical Technology 3 (3+0)

Prerequisite : None

This course covers the fundamental principles and technology in the pharmaceutical processing and manufacturing. Pharmaceutical dosage design and the suitability of the processing equipments are also covered in this course

EPF4607 Biological Process Engineering 3 (3+0)

Prerequisite : None

This course covers variety of biological products, bio-analysis methods, enzymatic process, microbial fermentation process and bioreaction kinetic. It also includes bioreactor design and bioseparation process

EPF4608 Palm Oil Processing 3 (3+0)

Prerequisite : None

This course covers the introduction to the palm oil industries in Malaysia and worldwide, primary and secondary processing operations of palm oil products, the machinery and equipments used in the operations and the utilisation of energy in the processing plant

EPF4702 Fabricated Food Technology 3 (3+0)

Prerequisite : None

This course covers basic principles, characterisations and processing technologies of fabricated food. This also include protein, carbohydrates, fats and others

EPF4703 Food Engineering Systems 3 (3+0)

Prerequisite : None

This course covers the essential and ancillary systems in food processing plant. Emphasis is also given on pumps, piping, electrical, food processing systems using heat, heat removal, drying, evaporation and materials handling

EPF4704 Food Extrusion Technology 3 (3+0)

Prerequisite : None

This course covers the principles, system and extrusion process design. Emphasis given include solving problems in extruder scale-up and optimization of operating variables for food applications

EPF4705 Powder Technology 3 (3+0)

Prerequisite : None

This course covers the evaluation of powder characteristics, handling, processing, flow and powder preparation as well as its application. Amongst the topic discussed are powder classification, powder flow, pneumatic flow, granulation, size reduction, fluidization, and dust hazard

EPF4706 Rice Processing 3 (3+0)

Prerequisite : None

This course covers the fundamental principles and technology of rice processing from harvesting to packaging. Emphasis is given on rice milling, quality and grading, rice products, and wastes and by-products from rice processing

EPF4709 Food Plant Cleaning and Sanitation 3 (3+0)

Prerequisite : None

This course covers principles and practices of cleaning and sanitation in the food processing industry. The teaching focuses on key components and cleaning process to achieve food safety system requirement

EPF4801 Process Equipment Design 3 (3+0)

Prerequisite : None

This course covers process equipment design to meet the performance and economic specifications. Emphasis is given on design procedures, materials and equipment selections

EPF4802 Process and Food Plant Design 3 (3+0)

Prerequisite : None

This course covers process and plant design procedures, mass and energy balance, material and equipment selection, and economic evaluation

EPF4804 Process Simulation and Optimization 3(2+1)

Prerequisite : None

This course covers the development of mathematical model for processes and optimization, and application of computer simulation software. Emphasis are also on theintegrationprocess and optimization process in computer aided process plant design

EPF4947 Process and Food Plant Design Project 4 (0+4)

Prerequisite : EPF4802

This course covers the aspects of design project for the process and food engineering discipline which simulates the design procedures in process industry. The skills and knowledge that the student learned from earlier food and process engineering fundamental courses enable for them to complete the plant design. The students is required to execute the planning and economics of food or bio-material process plant design. All aspects of the safe design of a process plant is also covered in this project. Team work is emphasized throughout the implementation of design project, also require documenting and presenting project output

EPF4806 Processing Machinery Dynamics 3 (3+0)

Prerequisite : None

This course covers the process dynamics in bio-materials and food processing machinery. This involves the mechanics in the unit operations involved in the processing, material properties during processing in the machine, and the application of knowledge solid mechanics and fluid mechanics for bio-materials and food processing machinery

EPF4807 Processing Machinery Elements Design 3 (3+0)

Prerequisite : None

This course covers the elements available inside bio-materials and food machinery. This involves stress analysis and non-linear behaviour of bio-materials and food to select suitable elements for machinery design

EPF4808 Processing Machinery System and Automation 3 (3+0)

Prerequisite : None

This course covers processing system and automation for processing machinery. It includes conventional and modern manufacturing systems, automation in machine movement, materials handling between production lines, quality assurance; and maintenance system for bio-materials and food machinery system