

**ISSAM FARES UNIVERSITY
INSTITUTE OF TECHNOLOGY**

INSTITUTE LIST

OFFICERS OF THE INSTITUTE

Salem, Elie	President of the University
Bashour, Tali'	Honorary Vice President for Medical Studies in the US
Nahas, Georges	Vice-President for Planning and Educational Relations
Karam, Nadim	Vice President for Health and Community Relations
Najjar, Michel	Vice President for Development, Administration and Public Affairs
Khalil, Elias	Director, Issam M. Fares University Institute of Technology
Moubayed, Walid	Dean of Admissions and Registration
Ayoub, Olga	Librarian

INSTITUTE STAFF

Jamil, Jalil	Assistant to the Director
Antoun, Sally	Laboratory Assistant
Elias, Camelia	Administrative Assistant
Khoury, Joanna	Administrative Assistant
Wehbeh, Laura	System Administration
Abboud, Anis	Hardware Application Specialist
Ibrahim, Nicole	Secretary
Hanna, Inaam	Receptionist
Sahmarani, Sary	Administrative Assistant, Comptroller
Georges, Marie-Louise	Administrative Assistant, Admissions and Registration
Koury, Habib	Administrative Assistant, Admissions and Registration
Atieh, Ghassan	Maintenance
Abdallah, Jean	Program Coordinator

INSTITUTE MEMBERS

Abboud, Mahassen	D.E.A, French Literature, Lebanese University, Lebanon
Abdallah-Raad, Josiane	M.A., English Linguistics, USEK, Lebanon
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Bakhit, Wael	Ph.D., Management and Finance, University of Perpignan, France

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Cambris, Najib	M.S., Aircraft Maintenance, Northrop University, USA
Cheikh, Rola	M.B.A., Business Administration, L.A.U., Lebanon
El Balaa, Rodrigue	Ph.D., Agricultural Sciences, INPL, France
Fares, Roula	Ph.D., Applied Mathematics, University of Jean Monet, France
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Ghosn, Sally-Anna	D.E.A., Translation, USEK, Lebanon
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Imad, Rodrigue	Ph.D., Telecom Engineering, Telecom Bretagne, France
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Jreige, Joceline	M.S., Management Information, Lebanese University, Lebanon
Jreige, Nassim	D.E.A., Finance, USEK, Lebanon
Kanaan, Mohamad	Ph.D., Electronics and Optoelectronics, University of Limoges, France,
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Karanouh, Sultan	B.S., Aircraft, Aeronautical Engineering, Embry-Riddle Aeronautical University, Florida, USA
Khalil, Dalia	T.D., English Literature (Linguistics), Lebanese University, Lebanon
Khalil, Elias	Ph.D., Physics. University of Montpellier, France
Khoury, Diana	Diplome, Human Resources, Tafe College, Australia

Kobrossi, Aline	M.B.A., Business Administration, ULF, Lebanon
Maarawi, Sonia	Diplome, Civil Engineering, Lebanese University, Lebanon
Makary, Vera	Ph.D., Nuclear Physics, University of Pierre and Marie Curie Paris 6- CEA /Sac Lay, France
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Merhabi, Dunia	M.A., French Literature, USEK, Lebanon.
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Michael, Joyce	M.S., Computer Science, USEK, Lebanon
Nachar, Rabih	M.S., Computer Engineering, University of Balamand, Lebanon
Naja, Ziad	Ph.D., Telecom Engineering, University of Paris Sud 11, France
Nasr, Nathalie	M.A., English Literature, Lebanese University, Lebanon
Nasr, Sandra	Master, Interior Architecture, Lebanese University, Lebanon
Nehme, Anita	D.E.A., Socio-Economy, University of Lumière 2 Lyon, France
Nehme, Gaby	Ph.D., Mechanical Engineering, University of Texas, USA
Nehme, Salem	T.D., English literature, Lebanese University, Lebanon
Raad, Robert	Ph.D., Electrical Engineering, University of Laval, Canada
Serhan, Carole	M.B.A, Business Administration, University of Balamand, Lebanon
Shanbour, Ibrahim	Ph.D., Electrical Engineering, St. Petersburg, Russia
Sheikh, Hussam	Ph.D., Mechanical Engineering, University of Nantes, France
Tanous, Camille	M.S., Mechanical Engineering, MC Neese State University, USA
Wehbe, Yara	M.A., English Language Teaching, University of Balamand, Lebanon
Wehbe, Simon	D.E.A., Mathematics, University of Cergy Pontoise, France

PROGRAMS OF STUDIES

The Institute of Technology includes the following programs:

- *Aircraft Maintenance Technology
- *Mechatronics Engineering Technology
- *Telecommunications and Networks Engineering Technology
- *Business Management and Administration
- *Agricultural Engineering Technology
- *Civil Engineering and Construction Technology
- *Information Technology

The Institute offers a three year program leading to the University Diploma of Technology (UDT).

The award of the University Diploma of Technology indicates that the graduate is ready to begin professional practice. The graduate may apply to advanced study leading to a Master's Degree in related fields, provided he/she has obtained a cumulative general average of at least 80 in the undergraduate studies; final decision on acceptance to the Master's Degree program resides with the Admissions Committee of the Institute, and successful completion of required remedial courses.

1. ADMISSION REQUIREMENTS

Admission to the undergraduate program in the Institute of Technology is normally restricted to the first year. However, in exceptional cases, and with the approval of the Admissions Committee, students transferring from other accredited institutions may be considered for admission on an individual basis provided the following requirements are satisfied:

- a-Enrollment quotas are not filled.
- b-The applicant attended an accredited institution of higher education and obtained a minimum average of 70 in at least 20 transferable credits or, has successfully completed one year of study.
- c-The applicant's Baccalaureate qualifies him/her for admission to the University.
- d-The applicant satisfies the University admission requirements concerning language proficiency.
- e-The Institute Admissions Committee has evaluated the applicant's qualifications for academic success in scientific subjects and approved the transfer admission.

2. ACADEMIC RULES AND REGULATIONS

A. GRADUATION REQUIREMENTS

Refer to the Graduation Requirements in the General Section.

B. DEAN'S HONOR LIST

To be placed on the Dean's Honor List at the end of a given Fall or Spring semester, a student must:

- a- Be registered for at least 12 credits,
- b- Not be on Probation,

- c- Have a semester average of at least 85 or above or be ranked in the top 10% of the class and have a semester average of at least 80,
- d- Have no failing, withdrawals, repeated or incomplete grades,
- e- Have no disciplinary in his record,
- f- Be deemed worthy by the Dean to be placed on the Honor List.

C. CHANGE OF MAJOR

To transfer from any other Institute of the University of Balamand to the Institute of Technology, the student must have a cumulative average of at least 70 to be eligible for consideration by the Admissions Committee of the Institute. The Institute Admissions Committee grants the final approval.

3-LABORATORY CHARGES

A. SUPPLIES

Each student taking laboratory subjects must furnish, at his/her expense, the necessary notebooks, blank forms, lab coat, and similar supplies. For regular students taking prescribed laboratory work, no charge is made for normal amounts of expendable material used in connection with laboratory subject. Expendable materials are those that are necessarily consumed or rendered unfit for further use in the normal conduct of a laboratory test. If an excessive amount of expendable material is required because of carelessness on the part of the student, the cost of the additional material will be charged to the student or group responsible.

B. DAMAGES

Students will be charged for damage to instruments caused by lack of care. The amount of the charge will be the actual cost of repair, and if the damage results in total loss of the apparatus, adjustment will be made in light of the condition of the instruments. Where there is danger of costly damage, an instructor will be asked to check the set up. When a group does laboratory work, charges for breakage will be divided among the members of the group concerned. The amount of the charge will be stated at the time or as soon as it can be determined.

AIRCRAFT MAINTENANCE (AVIONICS OPTION)

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 211	Aviation Mathematics	3
ACMN 212	Basic Aviation Physics	3
ACMN 213	Electrical Engineering Fundamentals	3
ACMN 214	Basic Aeronautics and Aerodynamics	3
AVEN 211	Aviation English I	2
COMP 211	Computer Techniques I	1
Total		15

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 221	Electronic Fundamentals	3
ACMN 222	Materials and Hardware	3
ACMN 223	Maintenance Practices I	3
ACMN 224	Technical Drawing I	1
ACMN 226	Aviation Mathematics II	3
AVEN 221	Aviation English II	2
COMP 221	Computer Techniques II	1
Total		16

ACMN 225	Industrial Training I	6
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SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 231	Human Factors & Regulatory Frameworks	3
ACMN 234	Digital Techniques and Instrumentation	3
ACMN 235	Maintenance Practices II	3
ACMN 236	Technical Drawing II	1
ACMN 237	Aircraft Aerodynamics and Structures	3
ACMN 238	Propulsion I	3
AVEN 231	Aviation English III	1
Total		17

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 244	Propellers	3
ACMN 245	Maintenance Practices III	3
ACMN 246	Avionics Lab I	3
ACMN 247	Aircraft Systems	3
ACMN 248	Propulsion II	3
AVEN 241	Aviation English IV	1
Total		16

ACMN 255 Industrial Training II 6

SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 311	Lebanese Aviation Regulations	3
ACMN 312	Helicopter Studies I	3
ACMN 313	Piston Engine Aeroplanes I	3
ACMN 314	Maintenance Planning and Scheduling	3
ACMN 315	Reciprocating Engines	3
AVEN 311	Aviation English V	1
Total		16

SEMESTER 6

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 324	Graduation Project	3
ACMN 325	Modern Avionics Systems	3
ACMN 326	Avionics Lab II	3
AVEN 312	Aviation English VI	1
	Elective	3
Total		13

Total Credits **105**

ELECTIVES

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 323	Maintenance Organization Management	
ACMN 327	Aviation Mathematics III	3
ACMN 331	Aircraft Interiors	3
ACMN 332	CAD/CAM	3
ACMN 334	Aircraft Smart Materials	3

AIRCRAFT MAINTENANCE
(AIRFRAMES AND ENGINES OPTION)

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 211	Aviation Mathematics	3
ACMN 212	Basic Aviation Physics	3
ACMN 213	Electrical Engineering Fundamentals	3
ACMN 214	Basic Aeronautics and Aerodynamics	3
AVEN 211	Aviation English I	2
COMP 211	Computer Techniques I	1
Total		15

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 221	Electronic Fundamentals	3
ACMN 222	Materials and Hardware	3
ACMN 223	Maintenance Practices I	3
ACMN 224	Technical Drawing I	1
ACMN 226	Aviation Mathematics II	3
AVEN 221	Aviation English II	2
COMP 221	Computer Techniques II	1
Total		16

ACMN 225	Industrial Training I	6
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SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 231	Human Factors & Regulatory Frameworks	3
ACMN 232	Turbine Aeroplane Aerodynamics	3
ACMN 233	Gas Turbine Engines I	3
ACMN 234	Digital Techniques and Instrumentation	3
ACMN 235	Maintenance Practices II	3
ACMN 236	Technical Drawing II	1
AVEN 231	Aviation English III	1
Total		17

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 241	Turbine Aeroplane Structures	3
ACMN 242	Turbine Aeroplane Systems	3
ACMN 243	Gas Turbine Engine II	3
ACMN 244	Propellers	3
ACMN 245	Maintenance Practices III	3
AVEN 241	Aviation English IV	1
Total		16

ACMN 255	Industrial Training II	6
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SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 311	Lebanese Aviation Regulations	3
ACMN 312	Helicopter Studies I	3
ACMN 313	Piston Engine Aeroplanes I	3
ACMN 314	Maintenance Planning and Scheduling	3
ACMN 315	Reciprocating Engines	3
AVEN 311	Aviation English V	1
Total		16

SEMESTER 6

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 321	Helicopter Studies II	3
ACMN 322	Piston Engine Aeroplanes II	3
ACMN 324	Graduation Project	3
AVEN 312	Aviation English VI	1
	Elective	3
Total		13

Total Credits **105**

ELECTIVES

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
ACMN 323	Maintenance Organization Management	3
ACMN 327	Aviation Mathematics III	3
ACMN 331	Aircraft Interiors	3
ACMN 332	CAD/CAM	3
ACMN 334	Aircraft Smart Materials	3

MECHATRONICS ENGINEERING TECHNOLOGY

ENGLISH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
TELT 211	Programming I	2
TELT 212	Computer & Internet	1
TELT 213	Digital Electronics	3
MECT 211	Calculus I	3
MECT 212	General Physics	2
MECT 213	Electrical Circuits I	3
UIOT 213	General English I ^(*)	3
Total		17

(*) Based on the placement level, the student can replace this course with any elective course.

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 221	Linear Algebra	3
MECT 222	Sensors	2
MECT 223	Electrical Circuits II	3
MECT 224	Industrial Automation I	2
TELT 221	Programming II	2
TELT 222	Microcontroller Systems Architecture	2
UIOT 223	General English II ^(*)	3
Total		17

(*) Based on the placement level, the student can replace this course with any elective course.

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 231	Probabilities	2
MECT 232	Optoelectronics	2
MECT 233	Electrical Circuits III	3
MECT 234	Linear Systems	2
TELT 231	Signal Processing	2
UIOT 233	General English III ^(*)	2
	Elective course: TELT 232 or MECT 235	3
Total		16

(*) Based on the placement level, the student can replace this course with any elective course.

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 241	Calculus II	2
MECT 242	Control Systems	2
MECT 243	Mechatronics I	3
MECT 244	Methodology	1
MECT 245	CAD design	1
TELT 224	Local Area Networks	2
UIOT 243	General English IV(*)	2
	Elective course: MECT 246 or TELT 223	3
Total		16

(*) Based on the placement level, the student can replace this course with any elective course.

MECT250	Training I	4
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SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 311	Robotics	2
MECT 312	Digital Signal Processing (DSP)	3
MECT 313	Mechatronics II	3
TELT 234	IP Technology	2
UIOT 350	Labor Law	1
UIOT 313	General English V	2
	Elective course: MECT 314 or MECT 315	3
Total		16

SEMESTER 6**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 323	Mechatronics III	3
MECT 324	Renewable Energy	3
UIOT 323	General English VI	2
UIOT 390	Graduation Project	3
	Elective course: MECT 325 or TELT 241	3
Total		14

MECT350	Training II	4
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Total credits **104**

(**) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.

ELECTIVES

SEMESTER 3

Course Code

MECT 235
TELT 232

Course Title

Science of Materials
Analysis and Design of Logic Systems

SEMESTER 4

Course Code

MECT 246
TELT 223

Course Title

Dynamics
Analog Communications

SEMESTER 5

Course Code

MECT 314
MECT 315

Course Title

Industrial Automation II
Thermodynamics

SEMESTER 6

Course Code

MECT 325
TELT 241

Course Title

Fluid Mechanics
Java

MECHATRONICS ENGINEERING TECHNOLOGY

FRENCH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
TELT 211	Programming I	2
TELT 212	Computer & Internet	1
TELT 213	Digital Electronics	3
MECT 211	Calculus I	3
MECT 212	General Physics	2
MECT 213	Electrical Circuits I	3
UIOT 211	English I	2
UIOT 212	Culture & Communication I	1
Total		17

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 221	Linear Algebra	3
MECT 222	Sensors	2
MECT 223	Electrical Circuits II	3
MECT 224	Industrial Automation I	2
TELT 221	Programming II	2
TELT 222	Microcontroller Systems Architecture	2
UIOT 221	English II	2
UIOT 222	Culture & Communication II	1
Total		17

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 231	Probabilities	2
MECT 232	Optoelectronics	2
MECT 233	Electrical Circuits III	3
MECT 234	Linear Systems	2
TELT 231	Signal Processing	2
UIOT 231	English III	1
UIOT 232	Culture & Communication III	1
	Elective course: TELT 232 or MECT 235	3
Total		16

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 241	Calculus II	2
MECT 242	Control Systems	2
MECT 243	Mechatronics I	3
MECT 244	Methodology	1
MECT 245	CAD Design	1
TELT 224	Local Area Networks	2
	Elective course: MECT 246 or TELT 223	3
	Elective course: UIOT 241 or UIOT 242	2
Total		16
MECT 250	Training	4

SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 311	Robotics	2
MECT 312	Digital Signal Processing (DSP)	3
MECT 313	Mechatronics II	3
TELT 234	IP Technology	2
UIOT 350	Labor Law	1
	Elective course: MECT 314 or MECT 315	3
	Elective course: UIOT 311 or UIOT 312	2
Total		16

SEMESTER 6**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 323	Mechatronics III	3
MECT 324	Renewable Energy	3
UIOT 390	Graduation Project	3
	Elective course: MECT 325 or TELT 241	3
	Elective course: UIOT 321 or UIOT 322	2
Total		14
MECT 350	Training II	4

() Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.**

Total credits 104

ELECTIVE :

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>
MECT 235	Science of Materials
TELT 232	Analysis and Design of Logic Systems

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>
MECT 246	Dynamics
TELT 223	Analog Communications
UIOT 241	English IV
UIOT 242	Culture & Communication IV

SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>
MECT 314	Industrial Automation II
MECT 315	Thermodynamics
UIOT 311	English V
UIOT 312	Culture & Communication V

SEMESTER 6

<u>Course Code</u>	<u>Course Title</u>
MECT 325	Fluid Mechanics
TELT 241	Java
UIOT 321	English VI
UIOT 322	Culture & Communication VI

TELECOMMUNICATIONS & NETWORKS ENGINEERING TECHNOLOGY -ENGLISH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
TELT 211	Programming I	2
TELT 212	Computer & Internet	1
TELT 213	Digital Electronics	3
MECT 211	Calculus I	3
MECT 212	General Physics	2
MECT 213	Electrical Circuits I	3
UIOT 213	General English I ^(*)	3
Total		17

(*) Based on the placement level, the student can replace this course with any elective course.

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 221	Linear Algebra	3
MECT 223	Electrical Circuits II	3
TELT 221	Programming II	2
TELT 222	Microcontroller Systems Architecture	2
TELT 223	Analog Communications	3
TELT 224	Local Area Networks	2
UIOT 223	General English II ^(*)	3
Total		18

(*)Based on the placement level, the student can replace this course with any elective course.

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 231	Probabilities	2
TELT 231	Signal Processing	2
TELT 232	Analysis and Design of Logic Systems	3
TELT 233	Digital Communications	2
TELT 234	IP Technology	2
UIOT 233	General English III ^(*)	2
	Elective course: MECT 232 or TELT 235	2
Total		15

(*) Based on the placement level, the student can replace this course with any elective course.

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 241	Calculus II	2
MECT 244	Methodology	1
MECT 245	CAD Design	1
TELT 241	Java	3
TELT 242	Information Theory	3
TELT 243	Switching in Local Networks	2
UIOT 243	General English IV ^(*)	2
	Elective course: TELT 244 or TELT 245	2
Total		16

(*) Based on the placement level, the student can replace this course with any elective course.

TELT 250	Training I	4
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SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
TELT 311	Operating Systems	2
TELT 312	Internet technology	3
TELT 313	Network security	3
TELT 314	Satellites and Radars	3
TELT 317	Laws and Economics of Networks	1
UIOT 313	General English V	2
UIOT 350	Labor Law	1
	Elective course: TELT 315 or TELT 316	2
Total		17

SEMESTER 6**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
TELT 321	Wireless LAN	3
TELT 322	Mobile Networks	3
UIOT 323	General English VI	2
UIOT 390	Graduation project	3
	Elective course: TELT 324 or TELT 325 or TELT 326	2
Total		13
TELT 350	Training II	4
Total credits		104

(**) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.

ELECTIVES

SEMESTER 3 :

<u>Course Code</u>	<u>Course Title</u>
MECT 232	Optoelectronics
TELT 235	Microwave

SEMESTER 4:

<u>Course Code</u>	<u>Course Title</u>
TELT 244	Fixed Telephony
TELT 245	Antennas and Propagation

SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>
TELT 315	Wide Area Network (WAN)
TELT 316	Networks Administration and Supervision

SEMESTER 6:

<u>Course Code</u>	<u>Course Title</u>
TELT 324	Transport of Multimedia Streams over IP
TELT 325	Transmission Standards
TELT 326	Database Principles

TELECOMMUNICATIONS & NETWORKS ENGINEERING

FRENCH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
TELT 211	Programming I	2
TELT 212	Computer & Internet	1
TELT 213	Digital Electronics	3
MECT 211	Calculus I	3
MECT 212	General Physics	2
MECT 213	Electrical Circuits I	3
UIOT 211	English I	2
UIOT 212	Culture & Communication I	1
Total		17

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 221	Linear Algebra	3
MECT 223	Electrical Circuits II	3
TELT 221	Programming II	2
TELT 222	Microcontroller Systems Architecture	2
TELT 223	Analog Communications	3
TELT 224	Local Area Networks	2
UIOT 221	English II	2
UIOT 222	Culture & Communication II	1
Total		18

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 231	Probabilities	2
TELT 231	Signal Processing	2
TELT 232	Analysis and Design of Logic Systems	3
TELT 233	Digital Communications	2
TELT 234	IP Technology	2
UIOT 231	English III	1
UIOT 232	Culture & Communication III	1
	Elective course: MECT 232 or TELT 235	2
Total		15

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 241	Calculus II	2
MECT 244	Methodology	1
MECT 245	CAD Design	1
TELT 241	Java	3
TELT 242	Information Theory	3
TELT 243	Switching in Local Networks	2
	Elective course: TELT 244 or TELT 245	2
	Elective course: UIOT 241 or UIOT 242	2

Total **16**

TELT 250 Training I 4

SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
TELT 311	Operating Systems	2
TELT 312	Internet technology	3
TELT 313	Network security	3
TELT 314	Satellites and Radars	3
TELT 317	Laws and Economics of Networks	1
UIOT 350	Labor Law	1
	Elective course: TELT 315 or TELT 316	2
	Elective course: UIOT 311 or UIOT 312	2

Total **17**

SEMESTER 6**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
TELT 321	Wireless LAN	3
TELT 322	Mobile Networks	3
UIOT 390	Graduation project	3
	Elective course: TELT 324 or TELT 325 or TELT 326	2
	Elective course: UIOT 321 or UIOT 322	2

Total **13**

TELT 350 Training II 4

Total credits **104**

(**) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.

ELECTIVES

SEMESTER 3 :

<u>Course Code</u>	<u>Course Title</u>
MECT 232	Optoelectronics
TELT 235	Microwave

SEMESTER 4 :

<u>Course Code</u>	<u>Course Title</u>
UIOT 241	English IV
UIOT 242	Culture & Communication IV
TELT 244	Fixed Telephony
TELT 245	Antennas and Propagation

SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>
UIOT 311	English V
UIOT 312	Culture & Communication V
TELT 315	Wide Area Network (WAN)
TELT 316	Networks Administration and Supervision

SEMESTER 6

<u>Course Code</u>	<u>Course Title</u>
UIOT 321	English VI
UIOT 322	Culture & Communication VI
TELT 324	Transport of Multimedia Streams over IP
TELT 325	Transmission Standards
TELT 326	Database Principles

BUSINESS MANAGEMENT AND ADMINISTRATION FRENCH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course</u>	<u>Credit</u>
BUST 212	Accounting I	3
BUST 213	Microeconomics	3
BUST 214	Financial Mathematics	3
BUST 215	Management Information I	2
UIOT 217	Business English I	2
UIOT 218	Culture & Communication I	2
Total		15

SEMESTER 2

<u>Course Code</u>	<u>Course</u>	<u>Credit</u>
BUST 221	Accounting II	3
BUST 222	Management Principles & Leadership	3
BUST 223	Analytical Accounting	2
BUST 224	Statistics & Probabilities	2
BUST 225	Management Information II	2
UIOT 227	Business English II	2
UIOT 228	Culture & Communication II	2
Total		16

SEMESTER 3

<u>Course Code</u>	<u>Course</u>	<u>Credit</u>
BUST 231	Macroeconomics	3
BUST 232	Advanced Accounting	3
BUST 233	Contracts & Obligations	2
BUST 234	Financial Analysis	3
UIOT 237	Business English III	2
UIOT 238	Culture & Communication III	2
Total		15

SEMESTER 4

<u>Course Code</u>	<u>Course</u>	<u>Credit</u>
BUST 341	Marketing Principles	3
BUST 342	Accounting Standards	2
BUST 343	Companies Accounting	2
BUST 344	Financial Management	3
BUST 345	Labor Law	2
BUST 346	Taxation	2
UIOT 247	Business English IV	1
UIOT 248	Culture & Communication IV	1
Total		16

BUST 250	Training I	4
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SEMESTER 5

<u>Course Code</u>	<u>Course</u>	<u>Credit</u>
BUST 351	Human Resources Management	3
BUST 352	Management Control & Budget	3
BUST 353	International Trading	3
BUST 354	International Finance	3
UIOT 317	Business English V	1
UIOT 318	Culture & Communication V	1
	Elective Course	2
Total		16

SEMESTER 6**

<u>Course Code</u>	<u>Course</u>	<u>Credit</u>
BUST 361	Production Management	2
BUST 362	Banking & Finance	2
BUST 363	Auditing	2
BUST 364	Business Policies	2
UIOT 328	Culture & Communication VI	1
UIOT 390	Graduation Project	3
	Elective Course	2
Total		14

BUST350	Training II	4
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Total credits **100**

(**) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.

ELECTIVES

SEMESTER 5

<u>Course Code</u>	<u>Course</u>
BUST 357	Business Evaluation
BUST 358	Trading Law

SEMESTER 6

<u>Course Code</u>	<u>Course</u>
BUST 367	Financial Communications
BUST 368	Sales Management

AGRICULTURE ENGINEERING TECHNOLOGY

FRENCH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 221	Biology I	3
AGRT 223	General Chemistry	2
AGRT 224	Organic and Analytical Chemistry	2
AGRT 227	Applied Calculus	2
AGRT 228	Microbiology and Immunology I	1
AGRT 230	Computer Tools	1
AGRT 231	Applied Physics	1
AGRT 232	General Physics	2
UIOT 215	English I	1
UIOT 216	Expression & Communication I	2
Total		17

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 222	Biology II	2
AGRT 229	Biology II Lab	2
AGRT 234	Biochemistry	3
AGRT 235	Biochemistry Lab	2
AGRT 236	Adaptation to the professional environment	1
AGRT 242	Statistics	2
AGRT 246	Food Industry Engineering	2
UIOT 225	English II	1
UIOT 226	Expression & Communication II	1
Total		16

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 259	Agrophysiology	2
AGRT 263	Data Analysis – Methodology	2
AGRT 264	Biotechnologies	2
AGRT 265	Natural and Transformed ecosystems	2
AGRT 267	Genetics applied to agriculture	2
AGRT 268	Professional Objectives & Business Training	1
AGRT 271	Quality - Supply Chain	2
AGRT 272	Soils - plants - climate system	2
UIOT 235	English III	1
UIOT 236	Expression & Communication III	1
Total		17

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 273	Management - Development	2
AGRT 274	From the organism to the Agro-system	3
AGRT 275	Agricultural economy	1
AGRT 276	Business economy and management	3
AGRT 277	Agricultural engineering	3
AGRT 279	Physiology & Production	3
UIOT 246	Expression & Communication IV	2
Total		17
AGRT 250	Training I	4

SEMESTER 5 (ANIMAL PRODUCTION)

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 320	Farm and Territorial Analysis	3
AGRT 323	Supply Chain Management	3
AGRT 324	Business and Project Management	3
AGRT 328	Development and Quality Control	3
AGRT 330	Computer tools	1
AGRT 331	Tutored projects	2
UIOT 316	Expression & Communication V	2
Total		17

SEMESTER 5 (FOOD INDUSTRY)

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 311	Detailed Biochemistry	2
AGRT 312	Detailed Physiochemistry	2
AGRT 313	Law and Legislation	1
AGRT 314	Business & Accounting	2
AGRT 315	Microbiology & Bioproduction	2
AGRT 316	Optional Module I	2
AGRT 317	Optional Module II	2
AGRT 319	Tutored Project	2
UIOT 316	Expression & Communication V	2
Total		17

SEMESTER 5 (PLANT PRODUCTION)

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 324	Business and Project Management	3
AGRT 325	Rural Development	3
AGRT 326	Economic and Social Development	3
AGRT 327	Diagnostics & Analysis	2
AGRT 332	Quality Development	2
AGRT 338	From diagnostics to projects	2
UIOT 316	Expression & Communication V	2
Total		17

SEMESTER 6 (ANIMAL PRODUCTION)**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 321	Technico-economical analysis	2
AGRT 333	Biological engineering	3
AGRT 334	Food Systems	2
UIOT 390	Graduation project	3
UIOT 326	Expression and communication VI	2
Total		12

SEMESTER 6 (FOOD INDUSTRY)**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 342	Total quality management	2
AGRT 343	Marketing, packaging & conditioning	2
AGRT 345	Organizing, production management - Planning	3
UIOT 390	Graduation project	3
UIOT 326	Expression & Communication VI	2
Total		12

SEMESTER 6 (PLANT PRODUCTION)**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 329	Business Knowledge	2
AGRT 333	Biological engineering	3
AGRT 340	Sustainable development	2
UIOT 390	Graduation project	3
UIOT 326	Expression & Communication VI	2
Total		12

AGRT 350	Training II	4
Total credits		104

() Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.**

CIVIL ENGINEERING AND CONSTRUCTION TECHNOLOGY – FRENCH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 211	Statics	3
CIVT 212	Principles of Programming	2
CIVT 213	Dynamics	3
MECT 211	Calculus I	3
TELT 212	Computer & Internet	1
UIOT 211	English I	2
UIOT 212	Culture & Communication I	1
Total		15

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 221	General Applied Chemistry	3
CIVT 222	Science of Materials	3
CIVT 223	Mechanics of Materials	3
CIVT 224	Technical Drawing	2
MECT 221	Linear Algebra	3
UIOT 221	English II	2
UIOT 222	Culture & Communication II	1
		17

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 231	Thermodynamics	3
CIVT 232	Fluid Mechanics	3
CIVT 233	Theory of Structures I	3
CIVT 234	Workshop Technology	2
MECT 231	Probabilities	2
UIOT 231	English III	1
UIOT 232	Culture & Communication III	1
Total		15

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 241	HVAC Principles & Equipment	3
CIVT 242	Topography & Surveying	3
CIVT 243	Soil Mechanics & Foundation	3
CIVT 244	Reinforced Concrete I	3
MECT 241	Calculus I	2
	Elective course: UIOT 241 or UIOT 242	2
Total		16
CIVT 250	Training I	4

SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 311	Steel Design	3
CIVT 312	Constructuion Materials & Methods	3
CIVT 313	Transportation Engineering	3
CIVT 314	Construction Planning & Scheduling	3
UIOT 351	Legislation & Law	2
	Elective course: UIOT 311 or UIOT 312	2
	Elective course: CIVT 315 or CIVT 316	3
Total		19

SEMESTER 6**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 321	Reinforced Concrete II	3
CIVT 322	Sanitary Engineering	3
UIOT 390	Graduation Project	3
	Elective course: UIOT 321 or UIOT 322	2
	Elective course: CIVT 323 or CIVT 322	3
Total		14
CIVT 350	Training II	4
Total credits		104

(**) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.

INFORMATION TECHNOLOGY
FRENCH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 211	End User Computing	3
INFT 212	Introduction to Business	2
INFT 213	Discrete Mathematics	3
INFT 214	Math II	3
INFT 215	Programming I	2
UIOT 211	English I	2
UIOT 212	Culture & Communication I	1
Total		16

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 221	Operating System	3
INFT 222	Open Source Software	3
INFT 223	Programming II	2
INFT 224	Human Computer Interaction	2
INFT 225	Programming Methodology	2
UIOT 221	English II	2
UIOT 222	Culture & Communication II	1
Total		15

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 231	Networking Principles & Design	3
INFT 232	Web Programming	3
INFT 233	Database	3
INFT 234	Computer Graphics	3
INFT 235	Object-Oriented Programming	3
UIOT 231	English III	1
UIOT232	Culture & Communication III	1
Total		17

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 241	Systems Analysis & Design	3
INFT 242	Software Processing	2
INFT 243	Switching in LANs	2
INFT 244	Java Technology	2
INFT 245	Multimedia Programming	2
INFT 246	Database Systems Management	3
	Elective course: UIOT 241 or UIOT 242	2
Total		16
INFT 250	Training I	4

SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 311	Software Quality	3
INFT 312	Digital Logic	3
INFT 313	Platform Technologies	3
INFT 314	Security Issues & Principles	3
INFT 315	Technical Support	3
	Elective course: UIOT 311 or UIOT 312	2
Total		17

SEMESTER 6**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 321	Network Configuration	3
INFT 322	Digital Media Development	3
INFT 323	Systems Administration	3
INFT 324	Graduation Project	3
	Elective course: UIOT 321 or UIOT 322	2
Total		14
INFT 350	Training II	4
Total credits		103

(**) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training 2.

ELECTIVES:

SEMESTER 4:

<u>Course Code</u>	<u>Course Title</u>
UIOT 241	English IV
UIOT 242	Culture & Communication IV

SEMESTER 5:

<u>Course Code</u>	<u>Course Title</u>
CIVT 315	Plans & Specifications
CIVT 316	Engineering Economy
UIOT 311	English V
UIOT 312	Culture & Communication V

SEMESTER 6:

<u>Course Code</u>	<u>Course Title</u>
CIVT 323	Construction estimating
CIVT 325	Electrical engineering
UIOT 321	English VI
UIOT 322	Culture & Communication VI

INFORMATION TECHNOLOGY

ENGLISH TRACK

SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 211	End User Computing	3
INFT 212	Introduction to Business	2
INFT 213	Discrete Mathematics	3
INFT 214	Math II	3
INFT 215	Programming I	2
UIOT 213	English I ^(*)	3
Total		16

(*)Based on the placement level, the student can replace this course with any elective course.

SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 221	Operating System	3
INFT 222	Open Source Software	3
INFT 223	Programming II	2
INFT 224	Human Computer Interaction	2
INFT 225	Programming Methodology	2
UIOT 223	General English II ^(*)	3
Total		15

(*)Based on the placement level, the student can replace this course with any elective course.

SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 231	Networking Principles & Design	3
INFT 232	Web Programming	3
INFT 233	Database	3
INFT 234	Computer Graphics	3
INFT 235	Object-Oriented Programming	3
UIOT 233	General English III ^(*)	2
Total		17

(*)Based on the placement level, the student can replace this course with any elective course.

SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 241	Systems Analysis & Design	3
INFT 242	Software Processing	2
INFT 243	Switching in LANs	2
INFT 244	Java Technology	2
INFT 245	Multimedia Programming	2
INFT 246	Database Systems Management	3
UIOT 243	General English IV ^(*)	2
Total		16

(*) Based on the placement level, the student can replace this course with any elective course

INFT 250	Training I	4
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SEMESTER 5

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 311	Software Quality	3
INFT 312	Digital Logic	3
INFT 313	Platform Technologies	3
INFT 314	Security Issues & Principles	3
INFT 315	Technical Support	3
UIOT 313	General English V ^(*)	2
Total		17

(*) Based on the placement level, the student can replace this course with any elective course

SEMESTER 6**

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 321	Network Configuration	3
INFT 322	Digital Media Development	3
INFT 323	Systems Administration	3
INFT 324	Graduation Project	3
UIOT 323	General English VI ^(*)	2
Total		14

(*) Based on the placement level, the student can replace this course with any elective course

INFT 350	Training II	4
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Total credits 103

() Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.**

COURSE DESCRIPTIONS

ACMN 211 AVIATION MATHEMATICS

3.0: 3 cr. E

Arithmetical terms and signs, methods of multiplication and division, factors and multiples, fractions and decimals, weights, measures and conversion factors, ratio and proportion, averages and percentages, areas and volumes, squares, cubes, square and cube roots, evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions, linear equations and their solutions, indices and powers, negative and fractional indices, binary and other applicable numbering systems, simultaneous equations, second degree equations with one unknown, logarithms, simple geometrical constructions, graphical representation; nature and use of graphs, graphs of equations\functions.

ACMN 212 BASIC AVIATION PHYSICS

3.0: 3 cr. E

Nature of matter: the chemical elements, elements of theory of stress, strain and elasticity: tension, compression, shear and torsion, linear movement, rotational movement, periodic motion, heat, efficiency, momentum, conservation of momentum, impulse, gyroscopic principles, friction: nature and effects, Bernoulli's Theorem, Venturi, temperature, heat definition, heat capacity, specific heat, heat transfer, first and second law of thermodynamics, gases: ideal gases laws, specific heat at constant volume and constant pressure, thermal energy, heat of combustion, nature of light, speed of light, laws of reflection and refraction, wave motion, sound: speed of sound, production of sound.

ACMN 213 ELECTRICAL ENGINEERING FUNDAMENTALS

3.0: 3 cr. E

Structure and distribution of electrical charges, static electricity and distribution of electrical charges, electro static laws of attraction and repulsion, Coulomb's law, conduction of electricity in solids, liquids, gases and vacuum, production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion, construction and basic chemical action, Ohm's law, Kirchoff's Voltage and Current Laws, resistance and affecting factors, resistors in series and in parallel, dissipation of power by resistor, power formula, operation and function of a capacitor, capacitor types, construction and function, theory of magnetism, magnetization and demagnetization, electromagnets construction and principles of operation, hand clasp rules, Fraday's Law, factors affecting mutual inductance, Lenz's law and polarity determining rules, principle uses of inductors, construction and purpose of components in DC generator, AC theory, phase voltage current relationships, Transformers construction and operation, operation, application and uses of low pass, high pass, band pass and band stop filters. AC generators, single-phase, two-phase and three phase alternators, construction, principles and characteristics of single- and poly-phase AC synchronous and induction motors.

ACMN 214 BASIC AERONAUTICS AND AERODYNAMICS

3.0: 3 cr. E

Physics of the atmosphere, International Standard Atmosphere, application to aerodynamics, flow around a body, boundary layer, laminar and turbulent flow, free-stream flow, relative airflow, up- and down-wash, stagnation, vortices, camber, chord, mean aerodynamic chord, profile drag, induced drag, center of pressure, angle of attack, wash in and wash out, fineness ratio, wing shape and aspect ratio, thrust, weight and aerodynamic resultant, generation of lift and drag, angle of attack, lift and drag coefficients, polar curve, stall, airfoil contamination including ice, snow and frost, Theory of Flight, relationship between lift, weight, thrust, and drag, glide ratio, steady, stable flights, performance, turns, load factor and its effects on stall, flight envelope and structural limitations, lift augmentation, longitudinal, lateral and directional stability (passive and active).

ACMN 221 ELECTRONIC FUNDAMENTALS

3.0: 3 cr. E

Semiconductors, diodes, symbols, characteristics and principles, series and parallel operation, Materials, electron configuration, electrical properties, P and N type materials, PN junction, development of a potential across a PN junction in different biased conditions, Diode parameters, Detailed operation and characteristics of silicon controlled rectifiers, Transistors, symbols, component description and orientation, characteristics and properties, construction and operation of PNP and NPN type transistors, oscillators, description and operation of logic circuits, linear circuits and operational amplifiers connection methods, open and closed loop systems.

ACMN 222 MATERIALS AND HARDWARE

3.0: 3 cr. E

Ferrous aircraft materials, characteristics, properties and identification of common alloy steels used in aircraft, Non-Ferrous aircraft materials, characteristics, properties and identification of common non-ferrous materials used in aircraft, Composites and non-metallic aircraft materials, characteristics, properties and identification of common alloy steels used in aircraft, Wooden structures, construction methods, characteristics, properties and types of wood and glue used in aeroplanes, preservation and maintenance of wooden structures, types of defects and repair, characteristics, properties and types of fabrics used in aeroplanes, inspection methods, types of defects and repair, Corrosion, formation, identification, causes.

ACMN 223 MAINTENANCE PRACTICES I

3.0: 3 cr. E

Safety Precautions-Aircraft and Workshop, precautions when working with electricity, gases, oils and chemicals, remedial action in case of emergency, knowledge of extinguishing agents. Workshop Practices: Care of tools, control of tools, Tools: operation and use of measuring tools, lubrication equipment and methods, general electrical test equipment. Engineering Drawings, Diagrams and Standards, ATA 100 and other applicable standards including AN, MS, NAS and MIL, wiring diagrams, schematic diagrams. Fits and Clearances, Riveting, inspection of riveted joints. Pipes and Hoses: inspection and testing, installation and clamping. Springs: inspection and testing. Sheet Metal, Soldering and Bonding: Methods and inspection.

ACMN 224 TECHNICAL DRAWING I

1.0: 1 cr. E

Equipment and basic drawing procedures, lettering and symbols, drafting geometry and single-view drawing, orthographic projection, dimensions, auxiliary views, sectional views, pictorial drawing (isometric and perspective), threads, weldments, developments, introduction to descriptive geometry, introduction to computer drafting, working drawings.

ACMN 225 INDUSTRIAL TRAINING I

1.0: 1 cr. E

Minimum of ten weeks (350 hours) full-time work placements at an aviation maintenance approved by the department. Training programmes for individual students should be agreed and approved by the department. A training report must be submitted at the end of the internship detailing the responsibilities, tasks and learnt experiences of the trainee.

ACMN 226 AVIATION MATHEMATICS II

3.0: 3 cr. E

This course is divided in two parts described hereunder.

Part I: Matrices and Determinants

Linear Simultaneous Equations, Matrix Arithmetic, Eigenvalues and Eigenvectors, Coordinate Transformation, Determinants, Properties, Properties of Determinants and Numerical Solution of Linear Equations.

Part II: Differential Equations

Notation and Definitions, Laplace Transforms, Solving linear first order ODE with constant coefficients. The general linear second order ODE and reduction of order. Solving linear second order ordinary differential

equations with constant coefficients. Orthogonal functions, Basic examples of partial differential equations (PDEs) and their solution. Laplace's equation, the diffusion equation and the wave equation, by separation of variables.

ACMN 231 HUMAN FACTORS AND REGULATORY FRAMEWORKS

3.0: 3 cr. E

Importance of human factors in aviation, human error and incidents, "Murphy's Law", Human performance and limitations, Social psychology, individual and group responsibility, peer pressure, factors affecting performance, Physical environment, climate and temperature, motion and vibration, working environment, Tasks, Communication, Human error, error types in maintenance tasks, implications, avoiding and managing errors, Hazards in the workplace, role of ICAO, role of EASA, maintenance staff certification, approved maintenance organizations, JAR-OPS-Commercial Air Transportation, Air Operators Certificates, responsibilities of air operators, Maintenance programmes, checks and inspections, manufacturer's service information, Maintenance documentation, maintenance manuals, structural repair manual, illustrated parts catalogue, etc.

ACMN 232 TURBINE AEROPLANE AERODYNAMICS

3.0: 3 cr. E

Theory of Flight, Aeroplane Aerodynamics and Flight Controls, operation and effect of roll control: High lift devices, Drag inducing devices, spoilers, lift dumpers, speed brakes, Effects of wing fences, Boundary layer control, Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, mass balance, control surface bias, aerodynamic balance panels, High speed flight, speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, Factors affecting airflow in engine intakes of high speed aircraft, Effects of sweepback on critical Mach number.

ACMN 233 GAS TURBINE ENGINES I

3.0: 3 cr. E

Fundamentals: Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle, force, work, energy, velocity, acceleration, construction and operation of turbojets, Engine Performance, engine efficiencies, by-pass ratio, engine pressure ratio, flat rating and limitations. Inlets: Compressor inlet ducts, inlet configurations, ice protection. Compressors: Axial and centrifugal types, operation and applications, air flow control. Combustion Section: Construction and operational principles. Turbine Section: Operation, characteristics of turbine blading, Exhaust: Constructional features and operational principles. Bearings and Seals. Lubricants and Fuels: Properties and specifications, safety precautions. Lubrication Systems: Operation, layout and components. Fuel Systems: Operation of engine control and metering systems. Air Systems: Operation of engine air distribution and anti-ice control, Starting and Ignition Systems: Operation and components, maintenance and safety requirements. Engine Indicating Systems: Exhaust Gas Temperature.

ACMN 234 DIGITAL TECHNIQUES AND INSTRUMENTATION

3.0: 3 cr. E

Electronic Instrument Systems: Typical arrangements and cockpit layout. Numbering Systems: binary, octal, hexadecimal, conversions. Data Conversion: Analogue data, digital data. Data Buses: Operation in aircraft systems. Logic Circuits: logic gate symbols. Basic Computer Structure: Terminology. Microprocessors. Electrostatic Sensitive Devices: Special handling of components, risk and damage awareness. Software Management Control: Awareness of restrictions, Electromagnetic Environment: Influence of EMC, EMI, HIRF, lightning and lightning protection on maintenance of electronic systems. Typical Electronic/Digital Aircraft Systems: General arrangement.

ACMN 235 MAINTENANCE PRACTICES II

3.0: 3 cr. E

Avionics General Test Equipment: Operation, function and use. Electrical Cables and Connectors: Continuity, insulation and bonding techniques, wiring protection techniques, looming and loom support, cable clamps, protective sleeving, shielding. Bearings: Testing, cleaning, inspection, lubrication, defects and causes. Transmissions: Inspection of gears, backlash, belts, pulleys, chains and sprockets. Inspection of jack screws,

levers and push-pull rod systems. Control Cables: Swagging of end fittings, inspection and testing, Bowden cables, aircraft flexible control systems. Composite and Non-metallic Materials Handling: Bonding practices, environmental conditions, inspection methods.

ACMN 236 TECHNICAL DRAWING II

1.0: 1 cr. E

3-D CAD: Geometric solids, angled surfaces, curved surfaces. Pictorial Illustration: Perspective, rendering. Working Drawings: Industrial manufacturing, details, assemblies. Product Design Drawings, aircraft and spacecraft, mechanical systems, gears and cams.

ACMN 237 AIRCRAFT AERODYNAMICS AND STRUCTURES

3.0: 3 cr. E

Theory of Flight, Aeroplane Aerodynamics and Flight Control: Roll control, ailerons and spoilers, pitch control, elevators and stabilators, variable incidence stabilizers, and canards, yaw control, rudder limiters, Control using elevons, ruddervators, high lift devices, slots, slats flaps, drag inducing devices, spoilers, lift dumpers, speed brakes, operation and effects of trim tabs, servo tabs, control surface bias. High Speed Flight: Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number. Rotary Wing Aerodynamics: Terminology, operation and effect of cyclic, collective and anti-torque controls. Aircraft Structures: Fundamentals of structural systems, zonal and station identification, electrical bonding, lightning strike protection provision.

ACMN 238 PROPULSION I

3.0: 3 cr. E

Constructional arrangement and operation of turbojet, Fundamentals: Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle. Engine Performance. Inlets: Compressor inlet ducts Compressors: Axial and centrifugal types, operation and applications, air flow control. Combustion Section: Construction and operational principles. Turbine Section: Operation, characteristics of turbine blading, blade disk attachments, nozzle guide vanes, blade stress and creep. Exhaust: Constructional features and operational principles. Bearings and Seals. Lubricants and Fuels: Properties and specifications. Lubrication Systems: Operation, layout and components. Fuel Systems: Operation of engine control and metering systems. Air Systems: Operation of engine air distribution and anti-ice control. Starting and Ignition Systems: Operation and components, maintenance and safety requirements. Engine Indicating Systems: Exhaust Gas Temperature.

ACMN 241 TURBINE AEROPLANE STRUCTURES

3.0: 3 cr. E

Airworthiness requirements for structural strength, structural classification Zonal and station identification systems. Drains and ventilation provisions, system installation provisions, Lightning strike protection provision, Construction methods of stressed skin fuselage, Structure assembly techniques. Methods of surface protection, Airframe symmetry, methods of alignment and symmetry checks. Fuselage (ATA 52/53/56) Construction and pressurization sealing, wing. Seat installation and cargo loading system, doors and emergency exits: construction, mechanisms. Windows and windscreen construction and mechanisms. Wings (ATA 57) construction. Stabilizers (ATA 55): construction and control surface attachment. Flight control surfaces (ATA 55/57): construction and attachment. Nacelles/Pylons (ATA 54): Construction, firewalls, engine mounts.

ACMN 242 TURBINE AEROPLANE SYSTEMS

3.0: 3 cr. E

Air supply: sources. Air-conditioning systems, air cycle and vapor cycle machines, distribution systems, Pressurization systems. Safety and warning devices. Instrument systems (ATA 31): Pitot-static systems, Gyroscopic systems: artificial horizon, attitude director, Compasses: direct reading, remote reading. Avionic systems: layouts and operation of auto flight, communications and navigation systems. Electrical Power: Battery installation and operation. Equipment and Furnishings (ATA 25): Emergency equipment requirements, galley installation, cargo handling and retention equipment, air stairs. Fire Protection (ATA 26): Fire and smoke detection, Flight Controls (ATA 27): Fuel Systems (ATA 28): System layout, Hydraulic Power (ATA 29): System layout, Ice and Rain Protection (ATA 30): Ice formation, classification and detection, anti-icing systems. Landing Gear (ATA 32): Construction and shock absorption. Lights (ATA 33): External lights including

navigation. Emergency lights. Oxygen (ATA 35): Cockpit and cabin system layout. Pneumatic/Vacuum (ATA 36): Systems layout. Water/Waste (ATA 38): System layout. On Board Maintenance Systems (ATA 45): Central maintenance computers, data loading systems, electronic library systems, printing, structure monitoring.

ACMN 243 GAS TURBINE ENGINES II

3.0: 3 cr. E

Power Augmentation Systems: Water injection. Turbo-prop Engines: Gas coupled/free turbine and gear coupled turbines, Turbo-shaft Engines: Arrangements. Auxiliary Power Units: Purpose. Power plant Installation: Firewalls. Fire Protection Systems: Operation of detection and extinguishing systems. Engine Monitoring and Ground Operation: Procedures for starting and ground run-up. Engine Storage and Preservation: Preservation and depreservation of engines, accessories and systems.

Pre-requisite: ACMN 233

ACMN 244 PROPELLERS

3.0: 3 cr. E

Fundamentals: Blade element theory. Propeller Construction: Methods and materials used in construction of composite and metal propellers. Pitch Control: Speed control and pitch change methods, Propeller Synchronization: Synchronizing and synchrophasing equipment. Ice Protection: Fluid and electrical de-icing equipment. Storage and Preservation: Static and dynamic balancing. Propeller Storage and Preservation.

ACMN 245 MAINTENANCE PRACTICES III

3.0: 3 cr. E

Aircraft Weight and Balance, aircraft weighing. Aircraft Handling and Storage: Aircraft taxiing/towing and safety precautions. Disassembly, Inspection, Repair and Assembly Techniques: Types of defects, visual inspection techniques. General repair methods, structural repair manual, ageing, fatigue and corrosion control programmes. Non-destructive testing techniques including dye penetration. Disassembly and re-assembly techniques, trouble shooting. Abnormal Events: Inspections following lightning strikes. Maintenance Procedures: Planning, modifications procedures.

ACMN 246 AVIONICS LAB I

3.0: 3 cr. E

In addition to the introduction of measurement theory, accuracy and precision concepts, error analysis and data handling, this course includes experiments in the field of avionics designed to consolidate classroom learning and workshop skills. Experiments include Pitot-static systems, conventional navigation and communication instrumentation.

ACMN 247 AIRCRAFT SYSTEMS

3.0: 3 cr. E

Autoflight (ATA 25): Fundamentals of automatic flight control including principles and terminology, command signal processing, Landing Systems: Principles, categories, modes of operation, Communication/Navigation (ATA 23/34): Radio wave propagation. Doppler navigation, flight director systems, area navigation (RNAV), flight management systems (FMS), Traffic alert and collision avoidance system (TCAS). Electrical Power (ATA 24): Batteries installation and operation, DC and AC power generation. Equipment and Furnishings: Electronic emergency equipment. Flight Controls (ATA 27): Primary controls, Fly-by-wire systems. Instrument Systems: (ATA 31) Classification. Lights (ATA 33): External lights including navigation, anti-collision, landing, taxi, ice. Internal lights including cabin, cockpit, cargo. Emergency lights. On Board Maintenance Systems (ATA 45): Central maintenance computers, data loading systems, electronic library systems, printing, structure monitoring.

ACMN 248 PROPULSION II

3.0: 3 cr. E

Electronic engine control and fuel monitoring systems (FADEC). Engine Indicating Systems: Exhaust gas temperature/interstage turbine temperature systems, engine speed, engine thrust indication, engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems, oil pressure and temperature, fuel pressure, temperature and flow, manifold pressure, engine torque, propeller speed.

Pre-requisite: ACMN 238

ACMN 255 INDUSTRIAL TRAINING II**6 cr. E**

Minimum of ten weeks (350 hours) full-time work placements at an aviation maintenance approved by the department. Training programmes for individual students should be agreed and approved by the department. A training report must be submitted at the end of the internship detailing the responsibilities, tasks and learnt experiences of the trainee.

ACMN 311 LEBANESE AVIATION REGULATIONS**3.0: 3 cr. E**

Lebanese Civil Aviation Safety Act, role of the Lebanese Civil Aviation Authority, Lebanese Aviation Regulations (LARS): Part I: General Provisions, Part II: Aircraft Identification, Registration and Operation, Part III: Aerodromes, Part IV: Personnel Licensing, Part V: Airworthiness, Airworthiness Standards, Flight Authority, Approved Maintenance Organizations, Amateur Built Aircraft, Aeronautical Products Distribution, Maintenance Requirements, Service Difficulty Reporting, Airworthiness Directives, Part VI: General Operating and Flight Rules, Part VII: Commercial Air Services. The course includes site visits to the LCAA headquarters to understand and appreciate its roles and responsibilities..

ACMN 312 HELICOPTER STUDIES I**3.0: 3 cr. E**

Theory of Flight-Rotary Wing Aerodynamics: Terminology. Flight Control Systems: Cyclic control, function and construction of blade dampers, construction and attachment, manual, hydraulic and fly-by-wire. Blade Tracking and Vibration Analysis: Rotor alignment, Main and tail rotor tracking, static and dynamic balancing, vibration types, vibration reduction methods, ground resonance. Transmissions: Gear boxes, main and tail rotors, clutches, free wheel units and rotor brake.

ACMN 313 PISTON ENGINE AEROPLANES I**3.0: 3 cr. E**

Revision of the Theory of Flight, Aeroplane Aerodynamics and Flight Controls as applied to piston engine aeroplanes. Piston Engine Aeroplane Structures: classification and zonal identification, drains and ventilation provisions, system installation provisions, lightning strike protection, aircraft bonding, construction methods, surface protection, airframe symmetry. Fuselage, wings, stabilizers, nacelles and pylons.

ACMN 314 MAINTENACE PLANNING AND SCHEDULING**3.0: 3 cr. E**

General outline of Production Planning and control, standard terminology, Maintenance philosophies and concepts, Planning methods and standards, Production forecasting, Materials Routing, Production methods and standards, Manpower planning, Production scheduling and control, Production performance analysis, Computer applications in aircraft maintenance engineering.

ACMN 315 RECIPROCATING ENGINES**3.0: 3 cr. E**

Fundamentals: Mechanical, thermal and volumetric efficiencies, operating principles of 2-stroke, 4-stroke, Otto and Diesel. Engine Performance: Power calculation and measurement, factors affecting engine power, mixtures/leaning, detonation and pre-ignition. Engine Construction: Crank case, crank shaft. Engine Fuel Systems: Carburettors, types, construction and operation principles. Fuel Injection Systems: Types construction and operational principles. Electronic Engine Control: Operation, fuel metering systems. Starting and Ignition Systems: Starting systems. Induction, Exhaust and Cooling Systems: Construction and operation, Supercharging/Turbocharging: Principles and purpose. Lubricants and Fuels: Properties and specifications. Lubrication Systems: Operation, layout, components. Engine Indication Systems: Engine speed. Powerplant Installation: Firewall configurations. Engine Monitoring and Ground Operation: Starting and ground run-up procedures. Engine Storage and Preservation: Preservation and depreservation of engines, accessories and systems.

ACMN 321 HELICOPTER STUDIES II**3.0: 3 cr. E**

Helicopter Structures: classification and zonal identification, drains and ventilation provisions, system installation provisions, lightning strike protection, construction methods, surface protection, airframe symmetry.

Helicopter Systems: Airconditioning, instruments and avionics, electrical power, equipment and furnishings, fire protection, fuel systems, hydraulic power, ice and rain protection, landing gear, lights, pneumatic/vacuum.

ACMN 322 PISTON ENGINE AEROPLANES II **3.0: 3 cr. E**

Piston Engine Aeroplane Systems: Airconditioning, instruments and avionics, electrical power, equipment and furnishings, fire protection, fuel systems, hydraulic power, ice and rain protection, landing gear, lights, pneumatic/vacuum.

ACMN 323 MAINTENACE ORGANIZATION MANAGEMENT **3.0: 3 cr. E**

This course deals with the integration of production, marketing, financial and behavioral models within the framework of an aircraft maintenance organization. The course relies on examples from the maintenance industry by examining case studies delivered through seminars and presentations of aircraft maintenance industrialists.

ACMN 324 GRADUATION PROJECT **3 cr. E**

A group project directed at implementing major maintenance or modification tasks on aircraft, their systems or components to the required safety and regulatory standards. The project culminates in the fulfillment, reporting and presentation of the tasks performed.

ACMN 325 MODERN AVIONICS SYSTEMS **3.0: 3 cr. E**

The course looks at the newly emerging technologies in aircraft navigation and communication systems. Through course work and directed research projects, it examines the development, airworthiness and safety requirements of modern equipment such as satellite navigation, ground proximity warning systems (GPWS), weather radar, traffic collision and avoidance systems (TCAS), reduced vertical separation minima (RVSM) systems.

ACMN 326 AVIONICS LAB II **3.0: 3 cr. E**

This course includes experiments in the field of avionics designed to consolidate classroom learning and workshop skills. Experiments include modern navigation and communication instrumentation.

ACMN 327 AVIATION MATHEMATICS III **3.0: 3 cr. E**

This course is divided into five parts, described below.

Part I: Basic Statistics: Definition of statistics, Population and sample, Statistical variables: Graphs: line diagram and histogram. Cumulative frequency, Cumulative distribution function and ascending cumulative curve. Mean, mode, median.

Part II: Correlation and Linear Regression: Graphical illustration of possible link which can exist between two quantitative variables. Definition and interpolation of the covariance. Determination of the linear regression line by ordinary mean square error method.

Part III: Elements of combinatory analysis and probability: Arrangement, Permutation and Combination: Definitions and properties.

Part IV: Usually distribution and numerical tables: Discrete and continuous random variables.

Part V: Estimation and parametric test: Point estimation of percentage, mean and variance. Confidence interval of percentage, mean and variance. Comparison of two independent samples, of two variances, of two paired samples, of observed mean to a value of reference, of two proportions, of observed proportion to a reference one. Pearson's correlation test.

ACMN 331 AIRCRAFT INTERIORS**3.0: 3 cr. E**

Documentation, removal and installation of aircraft interior components. Correct work techniques including interior photography prior to removal, assessment of safety and emergency equipment. Component installation including wall materials, insulation air ducts, lighting, flooring furniture, galleys, lavatories, accessories, etc. The course also includes the fabrication techniques for aircraft interiors such as seats, window covering, curtains, floor covering and general upholstery skills as well as heavy material sewing.

ACMN 332 CAD/CAM**0.3: 3 cr. E**

Terminology, concepts and building blocks of computer aided design and manufacture. Curve and surface display and manipulation. Data file structures and interfacing between CAD and CAM demonstrated by the manufacture of sample parts and components on CNC machine.

ACMN 333 AIRCRAFT SMART MATERIALS**3.0: 3 cr. E**

characteristics, design considerations, maintenance practices & repair procedures. Use of composite materials in modern aircraft structures. The use of FML (fiber metal laminate) on the Airbus A-380. Topics include: composites materials currently in use, thixotropic bonding paste, epoxies, etc., basic laminate design, understanding the essential theory behind the function and construction of a fiber laminate aircraft structure, health and safety considerations for any person or A.M.O. engaged in composite structures repair, shop practices and quality control methods, vacuum bagging and tooling, damage assessment and N.D.T. methods for detecting faults in composites laminates.

AGRT 221 BIOLOGY I**3.0: 3 cr. F**

This course covers cellular biology (organization & functioning of the eukaryote cells, biological membranes and animal and plant tissues. Population biology includes formal and molecular genetics. Histotechnology and interpretation of histological tissues. Taxonomy, structural and functional anatomy. Development biology (fertilization, embryogenesis, cellular differentiation. Animal and plant physiology.

AGRT 222 BIOLOGY II**2.0: 2 cr. F**

Animal physiology (experimental techniques on whole animals and isolated organs, studying major organic functions and their regulations). Animal cells culture. Plant Physiology (plant experimental techniques). Plant cells culture.

Basic microbiology including organization and functioning of prokaryotes and viruses, notions of bacterial taxonomy, nutrition and bacterial growth. Fundamental immunology (the immune system and its responses). Basic techniques in microbiology (culture media, sterilization techniques, observation, etc.) numbering bacterial population and immunological techniques.

Prerequisite: AGRT 221

AGRT 223 GENERAL CHEMISTRY**2.0: 2 cr. F**

The atom, chemical links, solutions chemistry, equilibrium and kinetics, practical applications of chemistry to equilibrium and chemical kinetics. The objectives are to know the basics of chemistry to understand its implications in the different domains of agriculture. To be capable of using laboratory equipment in chemical chemistry and using chemistry experimental methods, to analyze, interpret and present obtained results.

AGRT 224 ORGANIC AND ANALYTICAL CHEMISTRY**2.0: 2 cr. F**

Names in organic chemistry, stereochemistry, functional groups, organic synthesis and common analytical techniques in chemistry. The objective is to know the fundamental basics of organic and analytical chemistry and their use in agriculture.

AGRT 227 APPLIED CALCULUS**2.0: 2 cr. F**

This course includes fundamental notions concerning functions, integrals, differential calculus, probability applied to experimental biology problems. The objective is to be capable of using mathematical tools in the field of agriculture.

AGRT 228 MICROBIOLOGY AND IMMUNOLOGY I**1.0:1 cr. F**

Basic microbiology including organization and functioning of prokaryotes and viruses, notions of bacterial taxonomy, nutrition and bacterial growth. Fundamental immunology (the immune system and its responses). Basic techniques in microbiology (culture media, sterilization techniques, observation, etc.) numbering bacterial population and immunological techniques.

AGRT 229 MICROBIOLOGY AND IMMUNOLOGY II**2.0:2 cr. F**

Includes dissections of whole animal and organs as well as animal and plant tissues preparations. It also includes basic immunological techniques and immunological reactions.

AGRT 230 COMPUTER TOOLS**1.0:1 cr. F**

This course contains notions on computer environment and networks, the use of the internet and its applications and the study of main programs: spreadsheets, text handling, data bases, etc.

The objective is to become capable of creating and using a document, tables, graphs and data bases, to know how to manage a disk space and to know how to research and transmit information through the internet.

AGRT 231 APPLIED PHYSICS**1.0:1 cr. F**

This course includes the application of ionizing beams in biology, the application of electricity and electronics in optical measuring for an instrumental approach. Moreover, it allows the use of basic equipment in the different fields of physics (electricity, electronics, fluid mechanics and thermodynamics).

The objective is to know the basics of physics and to understand its implications in the different fields of agriculture, to be capable of using basic equipment in physics and to know and master the specific risks of this discipline.

AGRT 232 GENERAL PHYSICS**2.0: 2 cr. F**

This course includes notions of metrology, units and dimensions. Basic concepts include fluid mechanics, thermodynamics, electricity, optical studies, as well as experiments in the different fields of physics (Electricity, electronics, fluid mechanics and thermodynamics).

The objective is to know the basics of physics to understand its implications in the different fields of agriculture, to become able to use the measuring methods of physics, to know how to interpret, and present obtained results.

AGRT 234 BIOCHEMISTRY**3.0: 3 cr. F**

Protein structure and enzymology, nucleic acid structure, genome transmission and expression. Definition and application of molecular biology tools. Initiation to biometric techniques.

AGRT 235 BIOCHEMISTRY LAB**2.0: 2 cr. F**

Security measures in chemistry and biochemistry labs. Extraction, separation, purification and identification techniques. Fundamental analytical techniques. The objective is to know and master the risks specific to this science, master the techniques and methodologies necessary to lab practice of chemistry and biochemistry. Knowing how to analyse, and present obtained results.

AGRT 236 ADAPTATION TO THE PROFESSIONAL ENVIRONMENT**1.0: 1 cr. F**

A specialized program for every structure. Local adaptation to the professional environment. Every structure defines its ability and the necessary know how to obtain this module.

AGRT 242 STATISTICS**2.0: 2 cr. F**

Fundamental basics for descriptive statistics and its application to biology. The objective is to understand and be able to use for a results presentation basic statistics.

Parametric and non parametric statistical tests of significance and of comparison. Applied computer science. The objective is to know which statistical test is to be used considering realized observations. Using computer programs to conduct statistical tests on experimental data.

AGRT 246 FOOD INDUSTRY ENGINEERING**2.0: 2 cr. F**

Notion of applied physics including thermodynamics, fluid mechanics, food processing, basic notions of food industry engineering, statistics.

Applied physics, elementary notions of food processing, statistics. The aim is to know and be capable of applying the basic principles in industrial physics, thermodynamics, fluid mechanics, food processing, applied to food industry engineering.

AGRT 250 TRAINING I**4.0: 4 cr. F**

The students should do a training that is related to Agronomy. At the end of the training the students should deliver a report that describes their work during the training period.

AGRT 259 AGROPHYSIOLOGY**2.0: 2 cr. E/F**

Plant : Water and mineral nutrition, photosynthesis, vegetative multiplication, dormance, germination, flowering, vernalisation, sexual reproduction, phytopathology. Animal: Digestive physiology, nutrition, energetic metabolism, nitrogen, mineral and vitamin, reproduction cycle, endocrine control, notions of pathology and epidemiology, zoonosis.

AGRT 263 DATA ANALYSIS - METHODOLOGY**1.0: 1 cr. E/F**

Elementary statistics, experimental approach, experimental protocols, analysis of variance, data analysis (principle of methods and use strategies). The objective is to be capable of constructing a simple experimental protocol, to realize homogeneity and conformity tests, conceiving experimental plans. Knowing regression and correlation, statistical tables statistical programs.

AGRT 264 BIOTECHNOLOGIES**2.0: 2 cr. F**

Plant production in vitro, animal cells culture, cloning, transgenesis, applications to animal and plant production. Knowing the techniques of gene cloning, bank of genes, animal and plant transgenesis, regulations, industrial use. Mastering the techniques of genetic engineering and the techniques of in vitro culture.

AGRT 265 NATURAL AND TRANSFORMED ECOSYSTEMS**2.0: 2 cr. F**

Ecosystems concept, primary and secondary production, food chains, trophic dependence, biogeographical cycles, transformed ecosystems examples (agriculture, forest, agricultural landscape. The objective is to know the ecosystem concept, natural environment, analyze agrosystemic perturbation and acquire cartographic knowledge.

Agronometerology, bioclimatology, pedobiology, interaction micro-organisms / soil-plant-animal. The objective

is to know the constituents and properties of the soil, know the major national types of soil and their evolution, know water in the soil, need for water in cultures, symbiosis, etc. Determine an irrigation plan, analyze soils, ameliorate the structure and the fertility of the soil, etc.

AGRT 267 GENETICS APPLIED TO AGRICULTURE

2.0: 2 cr. F

Qualitative characteristics and genetic variability, heredity, population genetics, consanguinity, heterosis, genetic value estimation, genetic amelioration, selection method and selection program. The objective is to know the genetic diversity, evolution, mutation, migration, etc. Knowing and understanding selection programs, using technological tool in selection schemes.

AGRT 268 COMPLEMENTARY MODULE: PROFESSIONAL OBJECTIVES & BUSINESS TRAINING

1.0: 1 cr. F

Elaborating the personal and professional project, updating the competence balance sheet. Knowledge of the work market (open and hidden markets). Discovering professional environment and job search tools, job offers, data bases, CVs, cover letters, interview preparation, knowing the possibilities for academic studies.

The module content would be adapted to the student's path and to the local educational and professional specificities. The teaching could include one or more themes and be eventually the object of a transversal approach.

AGRT 271 QUALITY - SUPPLY CHAIN

2.0: 2 cr. F

Production conditions and products quality, relation between supply chain actors, "quality" approach. Knowing supply chain operators from producers to consumers. Knowing quality parameters of food products, having knowledge of the certification and legislation, knowing how to perform a flux study, being able to apply quality approach in a business (quality assurance, norms, etc.). Being able to have a "supply chain" approach. (products quality).

AGRT 272 SOIL- PLANTS - CLIMAT SYSTEM

2.0: 2 cr. F

Knowing the characteristics and constituents of soil, major national soil types and their evolution, soil water needs and plants water needs. Knowing meteorology basics, the material, its use and cost. Determining an irrigation plan and analyzing soils in order to improve their fertility and establish a fertilization plan.

AGRT 273 MANAGEMENT - DEVELOPMENT

2.0: 2 cr. F

Local development, rural management, protection and management of natural space. Knowing the components of a rural landscape and their study tools, the environmental policy tools in rural regions, the organization and the functioning of different collectivities and local and regional organisms. Being able to set up a program for rural space management.

AGRT 274 FROM THE ORGANISM TO THE AGROSYSTEM

3.0: 3 cr. F

The content of the module and its modalities will be adapted to the path chosen by the student and to the local teaching and professional specificities. The course may cover one or more themes such as analytical techniques, landscape management, agricultural and environmental activities, microbiology, etc. The main emphasis concerns the techniques, work execution and results analysis.

AGRT 275 AGRICULTURAL ECONOMY

1.0: 1 cr. F

General and agricultural economics. Agricultural organizations and professional environment. The objective is to know the general economy (markets, regulations, etc.), agricultural economy and to be able to perform a technical analysis of a workshop or / and agricultural production.

AGRT 276 BUSINESS ECONOMY AND MANAGEMENT**3.0: 3 cr. F**

Accounting, business fiscal management, marketing, legislation (rural law, environmental law). The objectives include having knowledge in the financial analysis of production system, partial budget, etc. Having rural law notion, structure control, judicial organization, being capable of reading a balance sheet, etc.

AGRT 277 AGRICULTURAL ENGINEERING I**3.0: 3 cr. F**

Presentation of production systems, technical itineraries, technico-economic management, products quality. Knowing the itineraries of different cultures, knowing the major cultivated plants and their development stage, major diseases and their treatments, analyze conventional and biological agricultural productions.

AGRT 279 PHYSIOLOGIE ET PRODUCTION**3.0: 3 cr. F**

The content of the module and its modalities will be adapted to the path chosen by the student and to the local teaching and professional specificities. The course may cover one or more themes such as phytopathology, hygiene quality, non food agricultural production, international agricultural development and sustainable agriculture.

AGRT 311 DETAILED BIOCHEMISTRY**2.0:2 cr. E**

Studying biomolecules and the physico-chemical properties and structural biochemistry. The objective is to understand how living organisms have extraordinary properties compared to the properties of inanimate matter, which constitute an organism which interacts one with another to maintain and perpetrate life.

AGRT 312 DETAILED PHYSIOCHEMISTRY**2.0: 2 cr. F**

Studying biomolecules and the physico-chemical properties and structural biochemistry. The objective is mainly molecular biology, which is to understand the mechanisms allowing an organism to perpetrate life, which means the study of biomolecules and the study of this molecular logic of the living organism.

AGRT 313 LAW AND LEGISLATION**1.0: 1 cr. F**

The objective of this course is to provide detailed knowledge of the labor law, sanitary and structural legislations, as well as the taxation system. Moreover, students would acquire knowledge of environmental legislation as well as import and export legislation on the local, regional and European levels.

AGRT 314 BUSINESS & ACCOUNTING**1.0: 1 cr. F**

This course offers elements of general, industrial and rural accounting, forecasts, predictions and investments. Moreover, on the business level, the course offers the basics of economic and management studies.

AGRT 315 MICROBIOLOGY & BIOPRODUCTION**1.0: 1 cr. F**

The objective is to be capable to proceed in microbiological analyses, identify major plant and animal mycoses, and make viral serodiagnostics and bacterial and viral molecular identification. Using certain tests and diagnostic technologies. Understanding the processes used by microorganism to produce bioproducts for different uses.

AGRT 316 OPTIONAL MODULE I**2.0: 2 cr. F**

In this module, the students can choose any course from the catalog, provided that this course has the same number of credits.

AGRT 317 OPTIONAL MODULE II**2.0: 2 cr. F**

In this module, the students can choose any course from the catalog, provided that this course has the same number of credits.

AGRT 319 TUTORED PROJECT

2.0: 2 cr. F

Team work of students under a tutor who would guide them in their bibliographical research, in their business reports, who would help them to learn to work independently. The objective is to know how to research, gather and analyze information, learn the multidisciplinary approach, master the oral expression and the report preparation and be prepared for a business internship.

AGRT 320 FARM AND TERRITORIAL ANALYSIS

3.0: 3 cr. F

The objective is to teach the students a rigorous and controllable approach capable of continuous questioning of the principles, laws and theories it elaborates. They will be capable of affirming that the scientific method is a learning system with an auto-corrective sub-system allowing it to verify the veracity, transferability and validity of the knowledge it produces.

The third part's objective is to help with the choice of the techniques, methods types of researched data, the nature of information and the intended audience. Quantitative and qualitative techniques, the choice of indicators (definition, pertinence and construction). The evaluation (continuous, comparative, etc.). Use and analyze gathered data for coherence, facing the identified problematic.

AGRT 321 TECHNICO-ECONOMICAL ANALYSIS

2.0: 2 cr. E

The second part provides the basics necessary for all the courses relevant to the management of a business including management and decision process, accounting and data collection, balance sheet analysis, status and results analysis, production cost and profitability threshold, status and financial evolution analysis, technico-economic data analysis, diagnostics and potential solutions and finally, partial budget.

AGRT 323 SUPPLY CHAIN MANAGEMENT

3.0: 3 cr. F

This course covers all zootechnical aspects relevant to herd management including breeding, milk, eggs and meat production, heat synchronization, kids breeding, artificial insemination, housing conditions, pasturing, etc.

Moreover, it helps understanding basic functions of the most common animal disease causing agents. Learn how to notice the symptoms and understand the functioning and the cure of major animal diseases. Using a defense system minimizing the access of pathogenic agents in farms and veterinary clinics.

AGRT 324 BUSINESS & PROJECT MANAGEMENT

3.0: 3 cr. F

Knowledge of business problematics, different types of enterprises, stakeholders, labor law, commercial law, industrial properties, patents, balance sheet, profit, annual report, accounting, audit, etc. The development of capitalism and industrialization, their critics (Marxism, environmentalists etc.). Management, hierarchy, human resources, salary negotiations, objectives evaluation, etc.

The objective of this course is to allow students identify business objectives, perform relevant planning and set proper short, medium and long term policies to reach these objectives be it on the financial, environmental, or productivity level, and to be able to evaluate the evolution of a business compared to these objectives.

Setting a project, identifying needed resources and time, preparing a detailed timeline. Following up with each actor in order to respect the set timeline, organizing work and distributing tasks and performing collective elaboration to deliver a determined project within the indicated time frame according to the identified characteristics, using the available resources.

AGRT 325 RURAL DEVELOPMENT

3.0: 3 cr. F

Knowledge of business problematics, different types of enterprises, stakeholders, labor law, commercial law, industrial properties, patents, balance sheet, profit, annual report, accounting, audit, etc. The development of capitalism and industrialization, their critics (Marxism, environmentalists etc.). Management, hierarchy, human resources, salary negotiations, objectives evaluation, etc.

AGRT 326 ECONOMIC AND SOCIAL DEVELOPMENT**3.0: 3 cr. F**

The objective of this course is to allow students identify business objectives, perform relevant planning and set proper short, medium and long term policies to reach these objectives be it on the financial, environmental, or productivity level, and to be able to evaluate the evolution of a business compared to these objectives.

General review of the laws and regulations governing the hygienic, environmental, labor and commercial facets. Financial analysis, preparing budgets, understanding financial reports and balance sheets. Setting marketing strategies, understanding consumers needs and performing SWOT analysis. Understanding the basics of import and export activities and relevant regulations.

AGRT 327 DIAGNOSTICS & ANALYSIS**2.0: 2 cr. F**

The objective is to teach the students a rigorous and controllable approach capable of continuous questioning of the principles, laws and theories it elaborates. They will be capable of affirming that the scientific method is a learning system with an auto-corrective sub-system allowing it to verify the veracity, transferability and validity of the knowledge it produces.

The objective of this course is to help with the choice of the techniques, methods types of researched data, the nature of information and the intended audience. Quantitative and qualitative techniques, the choice of indicators (definition, pertinence and construction). The evaluation (continuous, comparative, etc.). Use and analyze gathered data for coherence, facing the identified problematic.

AGRT 328 DEVELOPMENT & QUALITY CONTROL**3.0: 3 cr. F**

Experimenting system analysis processes, evaluation, knowing the criteria to choose a system analysis method for explanatory or decisional means. Studying the methods and instruments allowing to measure the performance of production systems or businesses. Elaborating and applying a score board for management and quality charters.

AGRT 329 BUSINESS KNOWLEDGE**2.0: 2 cr. F**

The aim of this course is to allow students perform proper diagnostics of the needs of an agricultural sub-sector and set relevant projects to cater for these needs in a lucrative and sustainable manner.

AGRT 330 COMPUTER TOOLS**1.0: 1 cr. F**

Mastering the use of different computer tools, including internet research as well as other Microsoft programs for data analysis, reports preparation and presentation preparation as well as information sharing on the web using blogs and social media.

AGRT 331 TUTORED PROJECTS**3.0: 3 cr. F**

Team work of students under a tutor who would guide them in their bibliographical research, in their business reports, who would help them to learn to work independently. The objective is to know how to research, gather and analyze information, learn the multidisciplinary approach, master the oral expression and the report preparation and be prepared for a business internship.

AGRT 332 QUALITY DEVELOPMENT**2.0: 2 cr. F**

Mastering biochemistry and applied physico-chemistry as well as food microbiology, food analysis, bioproduction, applied genetics in order to become capable of applying them to food industries.

Experimenting system analysis processes, evaluation, knowing the criteria to choose a system analysis method for explanatory or decisional means. Studying the methods and instruments allowing to measure the performance of production systems or businesses. Elaborating and applying a score board for management and quality charters.

AGRT 333 BIOLOGICAL ENGINEERING**3.0: 3 cr. F**

Mastering biochemistry and applied physico-chemistry as well as food microbiology, food analysis, bioproduction, applied genetics in order to become capable of applying them to food industries.

AGRT 334 FOOD SYSTEMS**2.0: 2 cr. F**

Studying different feeding systems, intensive and extensive systems, pasturing, rotation, etc. Preparing feeding rations according to the animal life cycle (growth, pregnancy, milking period, laying hens, etc).

AGRT 340 SUSTAINABLE DEVELOPMENT**2.0: 2 cr. F**

Ensuring the development of a business or an agricultural exploitation in a sustainable manner on the three levels (economic, social and environmental). Moreover, students would be able to perform relevant diagnostics of the status of sustainability, its dynamic evolution and ways to improve the sustainability compared to specific benchmarks.

AGRT 342 TOTAL QUALITY MANAGEMENT**2.0: 2 cr. F**

Knowing and understanding quality parameters of food production and agriculture supply chain. Mastering quality certification and legislation processes and being able to apply a quality approach in a business (quality assurance, norms)

AGRT 343 MARKETING, PACKAGING & CONDITIONING**2.0: 2 cr. F**

The objective of this course is to identify a product's strengths and become capable of highlighting them in order to increase attractiveness to the consumer. Applying the best packaging characteristics to serve the products attractiveness for the consumers and have the needed knowledge to adapt the characteristics of a certain product to serve the consumers' expectations.

AGRT 345 ORGANIZING, PRODUCTION MANAGEMENT - PLANNING**2.0: 2 cr. F**

Applying efficient time and resources management, organizing the work of different teams relevant to different facets or steps in a project. Planning and setting proper timelines, making sure deadlines are respected and using innovative solutions whenever delays are caused.

AGRT 350 TRAINING II**4 cr. F**

The students should do a training that is related to Agronomy. At the end of the training the students should deliver a report that describes their work during the training period.

AVEN 211 AVIATION ENGLISH I**2.0: 2 cr. E**

This course focuses on training students to communicate in an aviation environment. Emphasis is placed on learning aviation related vocabulary and producing paragraphs, short essays, comprehension and analysis of both oral and written texts.

AVEN 221 AVIATION ENGLISH II**2.0: 2 cr. E**

This course focuses on the four language skills required for successful participation in aviation studies. Attention is also to the presentation of oral reports and preparation of written reports related to aviation.

Pre-requisite: AVEN 211

AVEN 231/241/311/312 AVIATION ENGLISH III/IV/V/VI**1.0: 1 cr. E**

English language consolidation in the form of lectures, tutorials and language labs. Particular emphasis on the aeronautical environment.

BUST 212 ACCOUNTING I**3.0: 3 cr. F**

This course covers techniques for recording, classifying and summarizing financial information, completion of the accounting cycle, financial statements announcing the financial position, results of operations and business of a company representative assets circulating as money, receivable and stocks.

BUST 213 MICROECONOMICS**3.0: 3 cr. F**

This course is an introduction to the concept and analysis of microeconomics. It covers topics such as supply and demand, consumer behavior and theories of the firm, market structures and the evaluation factor.

BUST 214 FINANCIAL MATHEMATICS**3.0: 3 cr. F**

This course examines the short-term financial transactions as calculating simple interest, discount, equivalence of capital, and the long-term financial transactions as compounded interest calculation and discount, annuities, amortization borrowing and investment profitability.

BUST 215 MANAGEMENT INFORMATION I**2.0: 2 cr. F**

A laboratory course dealing with the basic use of a computer and computer applications.

BUST 221 ACCOUNTING II**3.0: 3 cr. F**

This course covers the accounting for assets and depreciation, depletion and natural resources, and intangible assets and amortization. It also covers partnerships and corporations, including the corresponding section of equity, payable bonds and statement of cash flows. The generally accepted accounting principles and analysis of financial statements are also covered.

Prerequisite: BUST 212

BUST 222 MANAGEMENT PRINCIPLES & LEADERSHIP**3.0: 3 cr. F**

It is an introductory course covering the basic principles of management, including the goal of putting technical, operational planning and control process. The course will introduce the student to the management functions (planning, organization and management) and their implementation.

BUST 223 ANALYTICAL ACCOUNTING**2.0: 2 cr. F**

This course prepares students for managerial role in the decision-making process; especially the concepts and principles that are the basis for the development of cost information. Topics covered include: processing labor control systems, profitability analysis, analysis of variance, cost behavior, relevant costs, standard costs, budgeting for standards, cost control and optimization. Emphasis will be placed on the methods by which an accountant can analyze and solve problem areas in management.

Pre-requisite: BUST 212

BUST 224 STATISTICS & PROBABILITIES**2.0: 2 cr. E**

This course emphasizes the use of quantitative methods as a tool to make well-adapted decisions. Topics include: the meaning, role and types of statistics and statistical data, descriptive measures, statistical inference, analysis of variations and multiple regression, correlation analysis, hypothesis testing, applications sampling distributions and the elements of the probability theory.

BUST 225 MANAGEMENT INFORMATION II**2.0: 2 cr. E**

This is a laboratory course dealing with the use and applications in the computer business.

Pre-requisite: BUST 215

BUST 231 MACROECONOMICS**2.0: 2 cr. E**

An introduction to the theory of macroeconomics production composition and determination: money, interest, banking and monetary policy, employment and inflation, fiscal policy and public debt. Different schools of thought are also reviewed.

BUST 232 ADVANCED ACCOUNTING**3.0: 3 cr. F**

This course covers the particular economic or legal situations. The analysis is based on fundamental accounting principles set forth by the PCG on the rules of accounting and accounting solutions doctrinal depth strives to translate complex situations in the light of the rules of accounting.

Pre-requisite: BUST 221

BUST 233 CONTRACTS & OBLIGATIONS**2.0: 2 cr. F**

This course prepares students for a study of the Lebanese legal system. Topics include: basic elements of contract law, negligence and product liability, property laws such as mortgages, landlord and tenant and personal properties.

BUST 234 FINANCIAL ANALYSIS**3.0: 3 cr. F**

A study of the techniques used by the chief financial officer in the planning and administration of the acquisition and the use of funds to maximize the value of company. Topics include: analysis of proportion, predicting the technical evaluation plans and the power of leverage.

Pre-requisite: BUST 221

BUST 250 TRAINING I**4 cr. E**

The students should do a training that is related to business or finance. At the end of the training the students should deliver a report that describes their work during the training period.

BUST 341 MARKETING PRINCIPLES**3.0: 3 cr. F**

This course prepares students for the evolution of the marketing concept, segmentation and positioning, strategic decisions involving product, price, promotion and distribution of important environmental variables affecting marketing decisions, as well as action plan and business control.

BUST 342 ACCOUNTING STANDARDS**3.0: 3 cr. F**

This course provides a framework to compare the accounting Lebanese system - theory and practice- in different countries. Topics include: major causes of international differences, international classification of accounts, harmonization and International Financial Report Standards, diversity report and financial practices across a variety of countries.

Pre-requisite: BUST 223

BUST 343 COMPANIES ACCOUNTING**2.0: 2 cr. F**

This course covers the accounting analysis of events that occurred during the life companies. It will enable the student to become familiar with the general characteristics of commercial companies (the contract companies, unincorporated companies and various types of companies, the characteristics of corporate accounting procedures and mergers of companies, and consolidation of the balance sheet).

Pre-requisite: BUST 212

BUST 344 FINANCIAL MANAGEMENT**3.0: 3 cr. F**

Topics covered include: risk and cost of capital, the principles and methods of asset management and planning and control for the accomplishment of both short and long term objectives.

Pre-requisite: BUST 234

BUST 345 LABOR LAW**2.0: 2 cr. F**

This course covers the legal relationship between employers and employees in the private sector. The topics treated include employment contracts, leave, compensation, the trial period, the termination and benefits according to laws and regulations.

BUST 346 TAXATION**2.0: 2 cr. F**

This course aims to prepare students for the challenges facing tax payers and tax managers in Lebanon and abroad. The topics treated include: tax regulations and their application to individuals and companies in a variety of conditions, the impact of taxation on business decisions.

BUST 350 TRAINING II**4 cr. F**

The students should do a training that is related to business or finance. At the end of the training the students should deliver a report that describes their work during the training period.

BUST 351 HUMAN RESOURCES MANAGEMENT**3.0: 3 cr. F**

An analysis of policies and practices relating to subcontract analysis, human resource planning, staffing, performance evaluation, training and development, wage and salary administration and collective labor agreement.

Pre-requisite: BUST 222

BUST 352 MANAGEMENT CONTROL & BUDGET**3.0: 3 cr. F**

This course covers: the estimates of money, capital budgeting, internal control and auditing.

Pre-requisite: BUST 344

BUST 353 INTERNATIONAL TRADING**3.0: 3 cr. F**

This course provides students with the technical trade. Topics covered include: commercial contracts, foreign shipping, marine insurance, trade finance and international business banking procedures.

Pre-requisite: BUST 341

BUST 354 INTERNATIONAL FINANCE**3.0: 3 cr. F**

This course covers topics on trade theory, the measure of a national balance of payments, foreign exchange markets and the work of international organizations (IMF, WTO).

Pre-requisites: BUST 213, BUST 231

BUST 357 BUSINESS EVALUATION**2.0: 2 cr. F**

Topics covered include: risk and cost of capital, the principles and methods of asset management and planning and control for the accomplishment of both short and long term objectives.

Pre-requisite: BUST 344

BUST 358 TRADING LAW**2.0: 2 cr. F**

This course deals with the basic concepts of commercial rights, including events related to corporate laws and regulations.

Pre-requisite: BUST 233

BUST 361 PRODUCTION MANAGEMENT **2.0: 2 cr. F**

This course emphasizes the economic analysis of production and cost elements in industrial organization.

Pre-requisite: BUST 222

BUST 362 BANKING & FINANCE **2.0: 2 cr. F**

This course focuses on the operations of commercial banks. It covers issues: credit analysis, investment policy, liquidity, business loans and consumer and repository management regarding monetary policy.

Pre-requisites: BUST 344

BUST 363 AUDITING **2.0: 2 cr. F**

This course defines the role of audit in business. Verification of balance sheet, the profit and loss account on the basis of internal control, declaration standards, auditing principles and legal liability are covered.

Pre-requisite: BUST 221

BUST 364 BUSINESS POLICIES **2.0: 2 cr. F**

This course is designed to integrate functional activities in the effective operation of an organization in progress. The emphasis is on the formulation of policy and strategic planning requires analysis of complex business situations.

Pre-requisites: BUST 234, 222, 341

BUST 367 FINANCIAL COMMUNICATIONS **2.0: 2 cr. F**

It is an advanced course covering the basic principles of management, including the goal of putting technical, operational planning and control process. The course will introduce the student to the new methods developed by the company to retain its customers, shareholders, to raise the price of its shares on the stock exchange to ensure its sustainability

Pre-requisite: BUST 222

BUST 368 SALES MANAGMENT **2.0: 2 cr. F**

This course provides the techniques of sales and sales management, including marketing problems for students. Applications to the problem of Lebanese and Middle Eastern markets will be made.

Pre-requisite: BUST 341

CIVT 211 STATICS **3.0: 3 cr. F**

Composition and resolution of forces, free-body diagrams, analysis of forces acting on structures and machines, shear and bending moment diagrams, friction, centroid and moment of inertia.

CIVT 212 PRINCIPLES OF PROGRAMMING **3.0: 3 cr. F**

Informal specifications of programs development as a problem solving activity, development of algorithms an implementation, practical programming experience through a conventional programming language offered only to civil engineering undergraduate students.

CIVT 213 DYNAMICS **3.0: 3 cr. F**

Kinematics and kinetics of particles: Force, acceleration, work, energy an momentum. Two dimensional kinematics and kinetics of rigid bodies, translational and rotational motions. Vibrations.

CIVT 221 GENERAL APPLIED CHEMISTRY **3.0: 3 cr. F**

This courses is designed to give the students a basic knowledge of chemistry change making them realize the importance of elements, components and mixture in everyday life. Also to show them how and chemical reactions occur and the significations of such chemical changes in the field of Biology, Medicine, Industry, ...

CIVT 222 SCIENCES OF MATERIALS**3.0: 3 cr. F**

Material classification. Atomic structures.. Crystal structure solidification. Crystalline imperfections. Phase Diagrams. Engineering alloys and mechanical properties of metals. Polymeric ceramic and magnetic materials. Corrosion. Composite materials.

CIVT 223 MECHANICS OF MATERIALS**3.0: 3 cr. F**

Introduction-Concept of stress; stress and strain. Axial loading; torsion; Pure bending; Transverse loading-Shear stress; Transformation of stress and strain; Deflection of beams; Columns.

Pre-requisites: CIVT 211

CIVT 224 TECHNICAL DRAWING**2.0: 2 cr. F**

Concepts and practices in lettering, geometric construction, multi-view and auxiliary projections, sections and connections, dimensioning, and isometric and oblique pictorials. Emphasis on freehand sketching skills.

CIVT 231 THERMODYNAMICS**3.0: 3 cr. F**

Basic concepts and definitions. Properties of pure substance. Heat Work. First Law of Thermodynamics. Entropy. Reversibility and irreversibility. Power and refrigeration cycles.

CIVT 232 FLUID MECHANICS**3.0: 3 cr. F**

Fluid properties, fluid statics and manometry, kinematics, basic conservation equations of continuity, momentum and energy. Incompressible flows. Viscous effects and pipes and restrictions, Laminar and Turbulent Flows. Dimensional Analysis and Similitude.

CIVT 233 THEORY OF STRUCTURES I**3.0: 3 cr. F**

Analysis of statically determinate structures: Elastic deformations; deflection of beams by Moment-Area Theorems, Conjugate-Beam Method. Deflections By Energy Methods, Virtual-Work Method, Castigliano's Second Theorem. Influence Lines and Criteria for Moving Loads; Statically Indeterminate Structures: Method of Consistent deformations; Slops-Deflection Method; Moment-Distribution Method.

Pre-requisite: CIVT 223

CIVT 234 WORKSHOP TECHNOLOGIES**2.0: 2 cr. E**

Drilling, milling, grinding, lath work, welding, molding, heat treatments, forging, electric workshop technologies.

CIVT 241 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**3.0: 3 cr. F**

Environmental comfort parameters. Heat transfer in building sections. Estimating heating, cooling and ventilation loads and the choice of appropriate systems. Selection of equipment, design and layout of distribution ducts, pipes, and outlets.

CIVT 242 TOPOGRAHY AND SURVEYING**3.0: 3 cr. F**

Principles of surveying, instruments, basic measuring procedures, error analysis, traverse, leveling and mapping, Principles and practice in measuring distances, elevation differences and angles; construction surveys, traverses, topographic surveys and subdivision of land, mass diagram, cut and fill calculations. Boundary surveys, area computations and profile surveys.

Pre-requisite: MECT 21

CIVT 243 SOIL MECHANICS & FOUNDATIONS**3.0: 3 cr. F**

Soil explorations and testing, foundation for buildings, piles and footing, bracing of open trenches, sheet piling, and laboratory testing of soils. Stability of slopes, earth pressure, steady seepage.

Pre-requisite: CIVT 223

CIVT 244 REINFORCED CONCRETE I**3.0: 3 cr. F**

Strength and deformation of reinforced concrete according to the provisions of the ACI Building Code; Beams in flexure and shear; Bond and development of bars; Deflection; One way ribbed and solid slabs; Short columns.

Pre-requisite: CIVT 233

CIVT 311 STEEL DESIGN**3.0: 3 cr. F**

Geotechnical engineering applications to the analysis, design construction of shallow foundations and earth retaining structures.

Pre-requisites: CIVT 243, 244

CIVT 312 CONSTRUCTION MATERIALS AND METHODS**3.0: 3 cr. F**

Materials and methods used in the construction industry . Physical and mechanical properties of construction materials; Portland cement concrete, asphalt, wood, ferrous metals, non-ferrous metals; proportioning of concrete mixtures including admixtures.

CIVT 313 TRANSPORTATION ENGINEERING**3.0: 3 cr. F**

The role of transportation in society and the engineer's role in planning, design and operation of transportation system; consideration of system constraints, costs and basic design criteria. Theory and practice in highway design according to AASHTO criteria; design of vertical and horizontal cross-section. Introduction to traffic elements including intersection design and analysis of roads and intersections service levels.

Pre-requisite: CIVT 242

CIVT 314 CONSTRUCTION PLANNING AND SCHEDULING**3.0: 3 cr. F**

Basic elements of management of civil engineering projects; roles of all participants in the process: owners, designers, contractors and suppliers; emphasis on contractual aspect of the process, project estimate, planning and controls. Planning, scheduling and control of construction projects; management functions, network techniques(CPM), resource scheduling, construction financing and cost/ schedule relations.

CIVT 315 PLANS & SPECIFICATIONS**3.0: 3 cr. F**

Plans, Specification and writing and interpretation, and contract documents related to the construction industry.

Pre-requisite: CIVT 224

CIVT 316 ENGINEERING ECONOMY**3.0: 3 cr. F**

The course introduces the student to the fundamental concepts of engineering economy covering: economic analysis of projects, operations analysis, as well as the evaluation of alternatives, namely, benefit/ cost ratio, present and annual worth, internal rate of return, and utility study. The course replacement analysis, depreciation methods, and risk analysis.

CIVT 321 REINFORCED CONCRETE II**3.0: 3 cr. F**

Design of reinforced concrete building and floor slab systems. Moment curvature relationship for beams and columns, bi-axially loaded columns, slenderness effects, interaction diagrams, shear and torsion in members. Extensive use of microcomputers.

Pre-requisite: CIVT 244

CIVT 322 SANITARY ENGINEERING**3.0: 3 cr. F**

Sources and quantities of water supply and methods of collection, treatment and distribution. Quantities, treatment and disposal of wastewater. Quality parameters, criteria and international standards for drinking water and wastewater pollution control.

Pre-requisite: CIVT 232

CIVT 323 CONSTRUCTIONS ESTIMATING**3.0: 3 cr. F**

An overview of the construction estimating process is presented. Topics covered include preparation of quantity take off, bill of quantities, detailed estimates for all different construction trades, i.e., materials and labor, along with pricing of bids. The student learns how to transfer estimates into the construction process and project management control tools. To emphasize the importance of computer application in estimating, the student designs several estimating spreadsheets. Familiarity with spreadsheet programs is an asset.

Pre-requisite: CIVT 314

CIVT 325 COMPUTER AIDED DESIGN**3.0: 3 cr. F**

Applications of interactive computer graphics to design of common Civil Engineering problems; Introduction to the stiffness method; Frame analysis, beam and arbitrary shaped slabs.

Pre-requisites: CIVT 212, CIVT 224

COMP 211 COMPUTER TECHNIQUES I**1.0: 1 cr. E/F**

Principles of personal computing as used in every day problem solving. The course includes personal productivity tool such as word processors, spreadsheets, presentation software, statistical software, data analysis software, database querying and internet use.

COMP 221 COMPUTER TECHNIQUES II**1.0: 1 cr. E/F**

Principles of business computing as used in modern enterprises. What-if type analysis, business charting and graphing, creating database reports, internet browsing, basic web page creation and maintenance.

Pre-requisite: COMP 211

INFT 211 END USER COMPUTING**3.0: 3 cr. E/F**

This course helps the student become a power user of several software packages used in business problemsolving. Topics covered include: personal productivity tools, what-if analysis, business charting and graphing, Internet browsing, and web page creation and maintenance. The course employs a combination of lecturebased delivery of material and experimental hands-on problem solving workshops.

INFT 212 INTRODUCTION TO BUSINESS**3.0: 3 cr. E/F**

This is an introduction to the major fields in business administration. It includes principles of management, marketing, finance, accounting and information systems.

INFT 213 DISCRETE MATHEMATICS**3.0: 3 cr. E/F**

This course teaches students how to think mathematically by covering the topics of computer representation for numbers, symbolic logic, sets, functions, induction recursion, Boolean algebra, and graph theory. The course also presents the fundamentals and techniques of linear algebra, providing the students with the tools to analyze matrices and determinants for solving systems of linear equations and giving them a solid knowledge on linear transformations.

INFT 214 MATHEMATICS II**3.0: 3 cr. E/F**

This course introduces the basic fundamentals of Calculus. Topics include: Continuous functions using intervals, odd and even parity, Periodicity, Fast and slow rhythms, correction, change of scale, Non derivative functions at a single point, Differentials, Derivatives of complex functions, Exponential and logarithmic functions, Properties of reciprocal trigonometric functions, Definition of the Riemann integral, Properties of the integral.

INFT 215 PROGRAMMING I**3.0: 3 cr. E/F**

Basics of algorithmic and programming language (C).

INFT 221 OPERATING SYSTEMS**3.0: 3 cr. E/F**

This course is a comprehensive survey of operating systems principles. Topics covered include: process description and control, threads, process and disk scheduling, file and memory and I/O management, concurrency, networking and distributed processing, security.

INFT 222 OPEN SOURCE SOFTWARE**3.0: 3 cr. E/F**

The course introduces the students to OSS philosophy, culture, benefits, drawbacks, applications, environment and development. It is a mixture of lecture, Lab and research instruction.

INFT 223 PROGRAMMING II**3.0: 3 cr. E/F**

Approach to object-oriented design, data structure. Object-oriented language, C ++ / C # or Java for example. Pre-requisite: INFT 215

INFT 224 HUMAN COMPUTER INTERACTION**2.0: 2 cr. E/F**

Presents a comprehensive introduction to the principles and techniques of human computer interaction: Foundations of HCI; context; human centered development; principles of good design; engineering tradeoffs; introduction to usability testing; Graphical user-interface design.

Pre-requisite: INFT 215

INFT 225 PROGRAMMING METHODOLOGY**3.0: 3 cr. E/F**

This course introduces students the foundation of the software development process. Programming is introduced as a problem solving activity by introducing students to a full-featured programming language (Java). Students learn all the skills in program design, implementation, and debugging necessary to solve computational problems. Emphasis is put on effective use of abstraction and the acquisition of software development skills. Topics include: Flow control, object-oriented analysis and design, abstraction, methods, arrays, encapsulation, inheritance.

Pre-requisite: INFT 215

INFT 231 NETWORKING PRINCIPLES AND DESIGN**3.0: 3 cr. E/F**

This course is an introduction to network principles and network design. Topics include: Basic concepts and terminology of computer networks, networking models and theory, networking protocols, LAN, WAN, MAN, wireless and mobile network technologies, network performance, network security, layers of the Internet Protocol Suite (the TCP/IP family of protocols), Internet addressing (IPv4, IPv6), and network applications and services (such as DNS, HTTP, peer-to-peer networks, web servers, VPN, open SSL.)

INFT 232 WEB PROGRAMMING**3.0: 3 cr. E/F**

This course is devoted to a survey Web site preparation, considering both client- and server-side programming. Special emphasis will be assigned to mark-up and scripting languages. Participant of the course will learn style considerations and Web site scripting and technology, web forms, control and web services will as well be covered.

INFT 233 DATABASE**3.0: 3 cr. E/F**

Data, DBMS architecture, schema and sub-schema, levels of data representation, database system life cycles. Relations within database architecture. Decomposition, normalization, hierarchy, and network. Data description language (DDL). Data manipulation language (DML); query languages and query optimization in centralization systems. Database security, integrity, and concurrence.

INFT 234 COMPUTER GRAPHICS**3.0: 3 cr. E/F**

The student learns how to produce different kinds of illustrations and posters using computer software: advertising art, technical drawing, book illustration, and map production. Topics covered include: drawing, transformations, layers, color palette, 3D drawing, perspective, light, rendering, and texture.

INFT 235 OBJECT-ORIENTED PROGRAMMING**3.0: 3 cr. E/F**

This is an advanced programming course. It covers the programming paradigms with examples, and the transition between modular programming and object-oriented programming. The course also covers data categorization and subdivision into classes and discusses inheritance of operations from one class to another. Pre-requisite: INFT 225.

INFT 241 SYSTEMS ANALYSIS & DESIGN**3.0: 3 cr. E/F**

Analysis concepts (fact-finding, interview, feasibility study, user requirements, structured system analysis, documentation). Design concepts (design of I/O, file specification, database, algorithms, software and hardware specifications). Project management. Practical applications. Schedule and cost.

INFT 242 SOFTWARE PROCESSING**2.0: 2 cr. E/F**

Topics include: the principal issues associated with software evolution and their impact on the software life cycle, the challenges of maintaining legacy systems and the need for reverse engineering, the process of regression testing and its role in release management, the impact of a change request to an existing product of medium size, software reuse.

INFT 243 SWITCHING IN LANS**2.0: 2 cr. E/F**

The course focuses on advanced IP addressing techniques (Variable Length Subnet Masking [VLSM]), command-line interface configuration of switches, Ethernet switching, Virtual LANs (VLANs), Spanning Tree Protocol (STP), and VLAN Trunking Protocol (VTP).

Pre-requisite: INFT 231

INFT 244 JAVA TECHNOLOGY**2.0: 2 cr. E/F**

This course introduces Java as a technology and a development and deployment platform (J2SE). It provides students with the skills to create applications that leverage the object-oriented features of Java, such as encapsulation, inheritance, and polymorphism. The course introduces students to GUI programming, multithreading, networking, and event-driven programming using Java technology GUI components. Students will develop classes to connect to SQL database systems by using the core aspects of JDBC API. Other topics include: Exception handling, multi-threading, RMI, two-tier and three-tier Java technology applications.

Pre-requisite: INFT 235

INFT 245 MULTIMEDIA PROGRAMMING**2.0: 2 cr. E/F**

This course permits students to acquire a good knowledge of multimedia technologies. The student learns through practical projects to edit and produce video clip with sound and animation. Topics include video morphing (dynamic imaging).

INFT 246 DATABASE SYSTEMS MANAGEMENT**3.0: 3 cr. E/F**

The course is an advanced one in database technologies and a continuation of the course dealing with database design. Topics included are: Storage and file structure, indexing and hashing, query processing, transaction concept, concurrency control, and recovery systems.

Pre-requisite: INFT 233

INFT 311 SOFTWARE QUALITY**3.0: 3 cr. E/F**

Topics include: program validation and verification, software validation tools, the different types and levels of testing (unit, integration, systems, and acceptance), test plan, inspection of code segment.

INFT 312 DIGITAL LOGIC**3.0: 3 cr. E/F**

Fundamental building blocks (logic gates, flip-flops, counters, registers, PLA); logic expressions, minimization, sum of product forms; register transfer notation; physical considerations (gate delays, fan-in, fan-out); Data representation; Assembly level organization and memory systems.

INFT 313 PLATFORM TECHNOLOGIES**3.0: 3 cr. E/F**

Topics include: Configure and use application server with server roles, application servers, managing web applications, troubleshooting servers with failed request tracing, using and managing remote programs and gateways, including troubleshooting and performance optimization.

INFT 314 SECURITY ISSUES AND PRINCIPLES**3.0: 3 cr. E/F**

Threats to information resources and appropriate countermeasures. Cryptography, identification and authentication, access control models and mechanisms, multilevel database security, steganography, Internet security, and intrusion detection and prevention.

INFT 315 TECHNICAL SUPPORT**3.0: 3 cr. E/F**

Topics included: A wide variety of strategies to build skill in problem solving. Practice of creative/lateral thinking techniques and communication skills to approach technical and non-technical problems. In-depth PC hardware and software installation and configuration. Portfolio materials preparation demonstrating problem solving skills and experience.

INFT 321 NETWORK CONFIGURATION**3.0: 3 cr. E/F**

This course provides a foundation of network administration including account administration, resource allocation and optimization, and service management. Strategies for maintaining robust and secure networks are explored. Topics include, but not limited to: Network administration and configuration, network management (SNMP), network security, access controls, error correction, routing protocols, congestion control (TCP, UDP), selection of topics including DHCP, ICMP, VPNs, and multicast.

INFT 322 DIGITAL MEDIA DEVELOPMENT**3.0: 3 cr. E/F**

Students learn how to design the content and structure of complex multimedia systems using a wide variety of industry standard tools. They develop skills in creating a range of resources - image, sound, animation, video, 3D and interactive elements - and learn how to assemble them into engaging, usable and useful products and services. By the end of the course students are competent in using the latest technologies to develop innovative digital media products.

INFT 323 SYSTEMS ADMINISTRATION**3.0: 3 cr. E/F**

This course provides a strong practical experience to operating systems, topics included: Samba, Email, Web serving, remote access, networking setup, proxy services, firewall and security administration, user and group accounts management, disaster recovery.

INFT 324 GRADUATION PROJECT**3 cr. E/F**

To graduate, students have to finish a project under the direct supervision of a faculty member. The project should cover a practical aspect of a research for students to work on its design from conception through implementation and testing. Students meet regularly with the instructor to track technical and project management issues. Complete project documentation, written reports and oral presentations are required.

MECT 211 CALCULUS I**3.0: 3 cr. E/F**

This course covers techniques of integration for definite and indefinite integrals as well as applications of definite integrals. The course then presents functions of several variables, limits and continuity of multivariable functions, partial derivatives, the chain rule and multiple integrals. The course then gives an overview of first and second order linear differential equations and their solution sets. The course finally presents the resolution of equations in the complex set.

MECT 212 GENERAL PHYSICS**2.0: 2 cr. E/F**

This course is designed to provide an overview of algebra based introductory physics, which is a requirement for most undergraduate science major students. The scope of this course is to develop knowledge of the fundamentals of mechanics, that including vectors, velocity and acceleration, motion in one dimension, falling bodies, motion in two dimensions, work and energy, energy conservation, circular and rotational motion. It is recommended for students to be up to date in studying lectures and notes and doing corresponding assigned problems on time.

MECT 213 ELECTRICAL CIRCUITS I**3.0: 3 cr. E/F**

The aim of this course is to understand the operation of electrical circuits and know the main laws related, to model these circuits of in continuous or alternating currents. In addition to classroom sessions, tutorials and practical work will be done. Students are thus able to solve electricity problems of varying complexity and test their theoretical knowledge in handling devices and electrical.

MECT 221 LINEAR ALGEBRA**3.0: 3 cr. E/F**

This course provides an introduction vectors, scalar multiplication, vector multiplication, mixed multiplication and applications, linear systems, matrix operations, echelon form, vector spaces, linear transformations, determinants, Eigen values, Eigen vectors.

MECT 222 SENSORS**2.0: 2 cr. E/F**

Topics include: Principle, usage patterns and implementation of position sensors, speed, temperature, pressure ... Formatting signal simulation, Setting the output quantities (torque, speed) of conventional engines (continuous, asynchronous, stepper brushless). Simulation, Implementation test bench.
Pre-requisite: MECT 213

MECT 223 ELECTRICAL CIRCUIT II**3.0: 3 cr. E/F**

The aim of this course is to understand the operation of electronic solid state devices such as diodes, bipolar junction transistor and metal oxide semi-conductor field effects transistors (MOSFET). The physical operating principles of these nonlinear devices will be covered.
Pre-requisite: MECT 213

MECT 224 INDUSTRIAL AUTOMATION I**2.0: 2 cr. E/F**

This course covers the following topics: Architecture of a programmable controller, Programming language (LD (Ladder), SFC (Sequential Function Chart), FB (Function Block Diagram), ST (Structured Text)), Input module, digital and analog outputs, Driving an electromagnetic load.

MECT 231 PROBABILITIES**2.0: 2 cr. E/F**

This course covers continuous and discrete probabilities. It also introduces the probability density functions as the Gaussian function, Poisson, Rayleigh, etc...

MECT 232 OPTOELECTRONICS**2.0: 2 cr. E/F**

This course covers the basics of optoelectronics. First, it gives a review about the wave motion (traveling and standing waves). Then, it presents the electromagnetic waves, the interference, the diffraction and the polarization phenomena. The laws of geometrical optics are reviewed and specially the total internal reflection. This part explain the propagation of light in optical fiber. Finally, the course presents the optical fibers physics, the optical sources, the photodetectors and the optical amplifiers.

MECT 233 ELECTRICAL CIRCUITS III**2.0: 2 cr. E/F**

Actually, Many devices require the use of electrical energy in various forms, hence the need for electrical power converters. After a short introduction to the power electronics, periodic reminders of non-sinusoidal signals and basic electronic components are Treated (diodes, transistors, thyristors ...). Rectifiers (single/three-phase, controlled / uncontrolled) are then presented in detail with capacitive and inductive filtering. In addition, different types of converters are Studied: AC / DC (rectifiers), DC / AC (inverter), AC / DC and AC / DC. Simulations are finally made in Multisim.

Pre-requisite: MECT 223

MECT 234 LINEAR SYSTEMS**2.0: 2 cr. E/F**

In this course, the control of the first and the second order continuous linear control systems are studied. The study involves the time domain analysis and the frequency domain analysis of both systems. Open loop and closed loop control analyses, closed loop system stability criteria (Cauchy, Nyquist, revers, Black criteria), precision of the control systems, and controllers (PD, PI, PID) are all investigated. Adding to this, the course covers technical topics like identification of processes using Strejc and Broida models, industrial techniques for regulation and control.

MECT 235 SCIENCE OF MATERIALS**3.0: 3 cr. E/F**

This course covers the following topics: Atomic structures of materials, materials classification, crystal imperfections, Electrical and mechanical properties of metal, composite materials and corrosion.

MECT 241 CALCULUS II**2.0: 2 cr. E/F**

This course prepares the students on how to make use of the tools of integral calculus and differential equations in other disciplines. Topics include: Integral calculation techniques, Integral calculation of standard trigonometric functions, Integral calculation of rational fraction functions, Differential linear equations of first and second order, with constant coefficients, Equivalent functions approaching infinity, Improper integrals (definitions, convergence, theory of positive functions, and absolute convergence of functions with complex values).

Pre-requisite: MECT 211

MECT 242 CONTROL SYSTEMS**2.0: 2 cr. E/F**

In this course, the control of the first and the second order digital linear control systems are studied. The study involves open loop and closed loop discrete analyses, closed loop stability analysis like Nyquist criteria, stability margin and precision of discrete control systems. Also, the course investigates digital controller calculations, PID, syntheses of digital controllers, RST controller, and other practical aspects for digital controllers.

Pre-requisite: MECT 234

MECT 243 MECHATRONICS I**3.0: 3 cr. E/F**

Topics include: MCC - 1Q chopper, Application to the control of a line following robot controlled by μ C. MCC-

1Q chopper: Theoretical study and simulation. Experimental study of the chopper controlled by μ C. Utilization of an industrial converter controlled by PLC.

Pre-requisite: TELT 222

MECT 244 METHODOLOGY

1.0: 1 cr. E/F

Topics include: Project Management: Perimeter project definition and scheduling, Time Management: PERT, GANTT, Milestones, Resource Management, and Cost Management. Practical work on Microsoft Project or PSN8 is done. The second part of this course covers Functional Analysis: Scope of the system, manifolds Diagram Interactors. FAST: Function Analysis System Technique. SADT: Structured Analysis and Design Technique. GMMA: Management Methods for On and Off.

MECT 245 CAD DESIGN

1.0: 1 cr. E/F

This computer-based course covers concepts and practices in lettering, geometric construction, multi-view and auxiliary projections, sections and connections, dimensioning, and isometric and oblique pictorials.

MECT 246 DYNAMICS

3.0: 3 cr. E/F

The covered topics are: Kinematics and Kinetics of particles: Force, acceleration, work and time kinematic, kinetic objects.

MECT 250 TRAINING I

4 cr. E/F

The students should do a training in a company that deals with the field of Mechatronics. At the end of the training the students should deliver a report that describes their work during the training period.

MECT 311 ROBOTICS

2.0: 2 cr. E/F

The course presents the basic components of robotics systems, kinematics for manipulators, selection of coordinate frames, homogeneous transformations, solutions to kinematics equations, Lagrangian equations and manipulator dynamics, motion planning, position, velocity and force control, controller design, digital simulations.

MECT 312 DIGITAL SIGNAL PROCESSING (DSP)

3.0: 3 cr. E/F

This course is an introduction to DSP concepts and implementation. It starts by explaining the need for digital signal processing and DSP systems. A complete model of a DSP system is examined from the input transducer, through all the stages including: signal conditioning, anti-aliasing filter, analog-to-digital and digital-to-analog conversion, output smoothing filter, and output transducers. Real life examples will be used to illustrate the use and need for each part of a DSP system.

MECT 313 MECHATRONICS II

3.0: 3 cr. E/F

This course presents an overview and applications of automotive digital systems and microprocessors. Topics include the study of the on-board computers used to regulate, monitor, and control various systems of the vehicle.

Pre-requisite: MECT 243

MECT 314 INDUSTRIAL AUTOMATION II

3.0: 3 cr. E/F

This course covers the techniques and methods of the supervisory or oversight function in industrial processes, and the technologies for establishing a supervisory system. Topics include the place and role of supervision in businesses, the functions filled by supervision: operation, maintenance, quality, production management, processes and man-machine interfaces, graphic presentations, standardization, configuration and set up of an industrial supervision software system, software interface techniques for the acquisition and sharing of information, coupling of databases and supervision, concepts in remote supervision.

Pre-requisite: MECT 224

MECT 315 THERMODYNAMICS**3.0: 3 cr. E/F**

The covered topics are: basic definitions and concepts of thermodynamics, First and second law of thermodynamics, reversibility and irreversibility.

MECT 323 MECHATRONICS III**3.0: 3 cr. E/F**

Ability to design and implement electronic systems in different contexts (automobile, other land transport, aviation, and communicating mobile objects) using all the possibilities of real-time computing and telecommunications.

Pre-requisite: MECT 313

MECT 324 RENEWABLE ENERGY**3.0: 3 cr. E/F**

This course covers principles and applications of alternative clean energy sources. Topics include: wind, solar, hydro, biomass, and other systems; mechanisms of renewable power generation, conversion, distribution and utilization.

Pre-requisite: METC 243

MECT 325 FLUID MECHANICS**2.0: 2 cr. E/F**

The covered topics are: Fluid properties, fluid statics and manometry, basic equations of continuity, momentum and energy. Incompressible flows, viscous effects in pipes and restrictions, Laminar and Turbulent Flows.

MECT 350 TRAINING II**4 cr. E/F**

The students should do a training in a company that deals with the field of Mechatronics. At the end of the training the students should deliver a report that describes their work during the training period.

TELT 211 PROGRAMMING I**2.0: 2 cr. E/F**

This course provides an introduction to the C programming language, the lingua franca of embedded processors and microcontrollers. It starts with basic programming concepts and finishes with advanced software problems.

TELT 212 COMPUTER & INTERNET**1.0: 1 cr. E/F**

This course is a grip of a computer work environment (text, spreadsheet, presentation ...) and internet (research, collaboration, mail,...).

TELT 213 DIGITAL ELECTRONICS**3.0: 3 cr. E/F**

In this course, basic functions of digital electronics are presented. Topics include : Binary/decimal/Hexadecimal conversion, logic gates, logic functions, sequential systems, counter and registers. The students will also learn how to program, simulate and test a programmable logic circuit.

TELT 221 PROGRAMMING II**2.0: 2 cr. E/F**

In this course, an approach to object-oriented programming is provided. An introduction to Object-oriented languages C++ and C# is given.

Pre-requisite: TELT 211

TELT 222 MICROCONTROLLER SYSTEMS ARCHITECTURE**2.0: 2 cr. E/F**

Topics include: Understanding the architecture of a processor system, controlling the implementation of the concepts of structured programming language C, interfacing a microcontroller with basic sensors and actuators, interfacing devices, managing inputs - digital and analog outputs, and evaluate the time constraints in the case of a simple application.

Pre-requisite: TELT 211

TELT 223 ANALOG COMMUNICATIONS**3.0: 3 cr. E/F**

This course focuses on data analog transmission. Modulation techniques are presented: Amplitude modulation (AM), frequency modulation (FM) and phase modulation (PM). Time and frequency multiplexers are also discussed as well as the concept of noise and channel. In addition, a detailed description of the structure of the AM/FM receiver is studied.

TELT 224 LOCAL AREA NETWORK**2.0: 2 cr. E/F**

Covered topics are: Serial transmission of information, RS232 / 422, USB. General networks: Concept "Integrated Manufacturing", Network Field / Network monitoring, OSI model, Topologies - Interfaces. Transmission protocols: Master-Slave/CSMA/Client-Server/Producer-Consumer, Physical layer, speed of transmission, MAC layer, Ethernet / TCP-IP, CAN, I2C.

TELT 231 SIGNAL PROCESSING**2.0: 2 cr. E/F**

This course covers simultaneously continuous-time and discrete-time signal transformations and system classifications; sampling, and quantization; reconstruction of signals; Linear Time Invariant analysis (convolution and ordinary differential/difference equation); Fourier series; Fourier transform; Z-transform; Introduction to digital filtering; Software: Labview.

TELT 232 ANALYSIS AND DESIGN OF LOGIC SYSTEMS**3.0: 3 cr. E/F**

Topics include: Different types of ASIC, FPGA, VHDL language applied to the combinational and sequential logic, Specification of digital systems, digital circuits synthesis, functional simulation / time.

Pre-requisite: TELT 213

TELT 233 DIGITAL COMMUNICATION**2.0: 2 cr. E/F**

The course covers baseband modulation techniques like PAM, PCM, DPCM and delta modulation, digital signaling formats, TDM, PPM and PWM. Further, the course includes band pass digital modulation techniques like ASK, BPSK, DPSK, FSK, MPSK, QPSK, MSK, spread spectrum systems, and signal-to-noise ratio performance evaluations and comparison.

TELT 234 IP TECHNOLOGY**2.0: 2 cr. E/F**

The course focuses on Routing Protocols and Concepts, intermediate routing protocols (RIP v2, single-area OSPF, EIGRP), TCP/IP, and access control lists (ACLs). Students will develop skills on how to manage Cisco IOS Software.

Pre-requisite: TELT 224

TELT 235 MICROWAVE**2.0: 2 cr. E/F**

This course covers microwave resonators, power dividers and directional couplers, microwave filters, ferromagnetic components, active microwave circuits, propagation, radiometry, heating and energy transfer.

TELT 241 JAVA**3.0: 3 cr. E/F**

This course aims to improve the art of programming introduced in the courses of C language by approaching more advanced concepts resulting from the object-oriented programming. Topics include: concepts of classes and objects, interfaces, events handling, input/output and data structures.

Pre-requisite: TELT 221

TELT 242 INFORMATION THEORY**3.0: 3 cr. E/F**

This course covers the entropy, relative entropy, mutual information, data compression, Huffman codes, Shannon-Fano-Elias coding, channel capacity, noiseless binary channel, BSC, BEC, AWGN channels, as well as channel coding techniques.

Pre-requisite: TELT 233

TELT 243 SWITCHING IN LOCAL NETWORKS**2.0: 2 cr. E/F**

The course focuses on advanced IP addressing techniques (Variable Length Subnet Masking [VLSM]), command-line interface configuration of switches, Ethernet switching, Virtual LANs (VLANs), Spanning Tree Protocol (STP), and VLAN Trunking Protocol (VTP).

Pre-requisite: TELT 234

TELT 244 FIXED TELEPHONY**2.0: 2 cr. E/F**

The aim of this course is to highlight the principle of fixed telephony. Topics include: introduction to telephony, commutated phone networks, communication between the telephone and the switch, wiring, infrastructure maintenance and installation at the subscriber.

TELT 245 ANTENNAS AND PROPAGATION**3.0: 3 cr. E/F**

The objective of this course is to understand the physical basis of antennas either transmitting or receiving electromagnetic signals: progressive and stationary waves, loss in a transmission line, radiation of filiform conductors, characteristic parameters of an antenna in reception and transmission modes, increasing the directivity and the gain of an antenna, antenna types. Practices are performed on a vector network analyzer.

TELT 250 TRAINING I**4 cr. E/F**

The students should do a training in a company that deals with the field of Networks and Telecommunications. At the end of the training the students should deliver a report that describes their work during the training period.

TELT 311 OPERATING SYSTEMS**2.0: 2 cr. E/F**

This course presents the functionalities of operating systems and allows the students to manipulate them using the command language. It presents also the fundamentals of the central unit management and the fundamentals of the internal organization/management of the memory.

TELT 312 INTERNET TECHNOLOGY**3.0: 3 cr. E/F**

The objective of this course is to provide the necessary technical elements in the development of Web pages (HTML, XML, PHP ...)

TELT 313 NETWORK SECURITY**3.0: 3 cr. E/F**

This course covers authentication and access control, integrity and confidentiality of data, database security, routing, firewalls intrusion detection/prevention, trusted operating systems, in addition to virtual private networks, web security, and industrial controls. The course examines threats and vulnerabilities to specific architectures and protocols, computer forensics and other security-related topics of current relevance.

TELT 314 SATELLITES AND RADARS**3.0: 3 cr. E/F**

This course covers the fundamentals of satellite communication like synchronous, asynchronous, active and passive satellites, orbiting, satellite angles, controls, stabilization, and satellite system model. In addition, basic radar system is also covered, including ranging, frequency and power utilization, pulse radar system, radar antennas, and radar scanning pattern, searching and tracking, ambiguity function, MTI and CW radar systems.

TELT 315 WIDE AREA NETWORKS (WAN)**2.0: 2 cr. E/F**

The course focuses on advanced IP addressing techniques (Network Address Translation [NAT], Port Address Translation [PAT], and DHCP), WAN technology and terminology, PPP, ISDN, DDR, Frame Relay, network management, and introduction to optical networking.

Pre-requisite: TELT 243

- TELT316 NETWORKS ADMINISTRATION AND SUPERVISION** **2.0: 2 cr. E/F**
 This course is designed to provide students with essential knowledge and skills that an effective network administrator and supervisor must possess. It provides an overview of the essential TCP/IP protocols, and discusses how to properly configure and manage the network services based on these protocols.
- TELT317 LAWS AND ECONOMICS OF NETWORKS** **1.0: 1 cr. E/F**
 This course focuses on the law of internet and networks in Lebanon.
- TELT 321 WIRELESS LAN** **3.0: 3 cr. E/F**
 The objective of this course is to present wireless standards like ZigBee, Bluetooth, IEEE 802.11. We are interested in particular on the access methods (CSMA / CA ...), mobility (CoA ...), security (WEP, WPA2 ...).
- TELT 322 MOBILE NETWORKS** **3.0: 3 cr. E/F**
 This course presents the different technologies in mobile networks. Topics include: cellular networks and wireless communication systems, the radio-mobile channel, GSM system, GPRS, third generation systems (3G) as well as fourth generation systems (4G).
- TELT 324 TRANSPORT OF MULTIMEDIA STREAMS OVER IP** **2.0: 2 cr. E/F**
 This course puts out the next-generation IP networks for the provision of applications and triple play services (voice, video and Internet). In addition, it focuses on the encoding/compression, encapsulation of audio & video and RTP/RTCP and adjusts the quality of service applied to the transport of voice over IP.
- TELT 325 TRANSMISSION STANDARDS** **2.0: 2 cr. E/F**
 This course presents the standards used in many transmission systems such as Satellite transmission (DVB-SC, DVB-TS, DVB-RCS,...), mobile transmission, etc.
- TELT 326 DATABASE PRINCIPLES** **2.0: 2 cr. E/F**
 This course introduces the basics of database systems, as well as the modeling, design and manipulation of relational databases. The students will gain the required knowledge to describe databases, their characteristics, functions, etc. Topics include data modeling, database design theory, data definition and manipulation languages, storage and indexing techniques, etc.
- TELT 350 TRAINING II** **4 cr. E/F**
 The students should do a training in a company that deals with the field of Networks and Telecommunications. At the end of the training the students should deliver a report that describes their work during the training period.
- UIOT 211 ENGLISH I** **2.0: 2 cr. E**
 This course focuses on training students to communicate in a technical environment. Students will learn technical related vocabulary and producing paragraphs, short essays, comprehension and analysis of both oral and written texts.
- UIOT 212 CULTURE & COMMUNICATION I** **1.0: 1 cr. E**
 This course helps the student to develop and understand written and oral messages in French, respecting the basic rules of communication.
- UIOT 213 GENERAL ENGLISH I** **3.0: 3 cr. E**
 This course focuses on training students to communicate in a technical environment. Students will learn technical related vocabulary and producing paragraphs, short essays, comprehension and analysis of both oral and written texts.

UIOT 215 ENGLISH I**1.0: 1 cr. E**

Vocabulary & grammar (enriching acquiring vocabulary, learning specific vocabulary). Writing skills (writing a document : letters, emails etc.). Oral comprehension (identifying and understandable reproduction of major elements in real communication situations).

UIOT 216 EXPRESSION & COMMUNICATION I**2.0: 2 cr. F**

Self consciousness (time management, self control, personal work methodology, autodiagnosics). Read and written expression, using communicational and informational technologies. Knowledge of the professional and personal environment. Group dynamism.

UIOT 217 BUSINESS ENGLISH I**2.0: 2 cr. E**

Improve the level of understanding of the current written and spoken English. Writing: global understanding written documents. Write simple documents in English. Oral: Expressing simple concepts orally. Simply communicate with anyone in any situation.

UIOT 218 CULTURE & COMMUNICATION I**2.0: 2 cr. F**

To develop and understand short messages, written and oral, respecting the basic rules of communication.

UIOT 221 ENGLISH II**2.0: 2 cr. E**

This course focuses on the four language skills required for successful participation in technical studies. Attention is also given to the presentation of oral reports and preparation of written reports related to Mechatronics and Telecommunications.

Pre-requisite: UIOT 211

UIOT 222 CULTURE & COMMUNICATION II**1.0: 1 cr. F**

This course helps the student to develop and understand written and oral messages in French, respecting the basic rules of communication.

Pre-requisite: UIOT 212

UIOT 223 GENERAL ENGLISH II**3.0: 3 cr. E**

This course focuses on training students to communicate in a technical environment. Students will learn technical related vocabulary and producing paragraphs, short essays, comprehension and analysis of both oral and written texts.

Pre-requisite: UIOT 213

UIOT 225 ENGLISH II**1.0: 1 cr. E**

Studying texts relevant to daily life. Comprehension of written and conversational documents. Practicing written and oral restitution. The objective is to be able to read and understand relevant documents around daily life scenarios. To be able to answer a written questionnaire relevant to these documents. Being able to present information gathered in written and discussed documents.

Pre-requisite: UIOT 215

UIOT 226 EXPRESSION AND COMMUNICATION II**1.0: 1 cr. F**

Peculiarities of the language and the scientific and technical vocabulary, characteristics and techniques of scientific communication, documents preparation and presentation. Reading, analyzing, using non textual documents (images, photos, charts, etc.). Self consciousness, personal and pre-professional balance. Confrontation of personality traits and acquired competence with the chosen profession.

Pre-requisite: UIOT 216

UIOT 227 BUSINESS ENGLISH II**2.0: 2 cr. E**

Improve the level of understanding of the current written and spoken English. Writing: global understanding written documents. Write simple documents in English. Oral: Expressing simple concepts orally. Simply communicate with anyone in any situation.

Pre-requisite: UIOT 217

UIOT 228 CULTURE & COMMUNICATION II**2.0: 2 cr. F**

To document, collect and analyze information, Argue personal reflection. Produce documents, and oral presentation.

Pre-requisite: UIOT 218

UIOT 231 ENGLISH III**1.0: 1 cr. E**

This course involves English language consolidation in the form of lectures, tutorials and language labs. Particular emphasis on the technical environment.

Pre-requisite: UIOT 221

UIOT 232 CULTURE & COMMUNICATION III**1.0: 1 cr. F**

In this course, the student will learn how to document, collect and analyze information, argue personal reflection, produce documents and make an oral presentation.

Pre-requisite: UIOT 222

UIOT 233 GENERAL ENGLISH III**2.0: 2 cr. E**

This course focuses on training students to communicate in a technical environment. Students will learn technical related vocabulary and producing paragraphs, short essays, comprehension and analysis of both oral and written texts.

Pre-requisite: UIOT 223

UIOT 235 ENGLISH III**1.0: 1 cr. E**

Increase the vocabulary relevant to the technical field to understand a scientific article. Learn to gather multiple information coming from diversified scientific sources. Create a technical standardization document based on multiple documents. Knowing how to select, classify and present information relevant to the required task.

Pre-requisite: UIOT 225

UIOT 236 EXPRESSION & COMMUNICATION III**1.0: 1 cr. E/F**

Scientific expression and communication in relation with concerned teaching. Elaborating folders, reports, posters, presentations, with or without a report. Elaborating a communication tool, document of synthesis, services offer with abilities, capabilities and career expectations. Papers and scientific publications analysis, audio-visual and technical documents. Learn how to analyze information in an organized manner.

Pre-requisite: UIOT 226

UIOT 237 BUSINESS ENGLISH III**2.0: 2 cr. E**

Improve the level of understanding of the current written and spoken English. Writing: global understanding written documents. Write simple documents in English. Oral: Expressing simple concepts orally. Simply communicate with anyone in any situation.

Pre-requisite: UIOT 227

UIOT 238 CULTURE & COMMUNICATION III**2.0: 2 cr. F**

To document, collect and analyze information, Argue personal reflection. Produce documents, and oral presentation.

Pre-requisite: UIOT 228

UIOT 241 ENGLISH IV**2.0: 2 cr. E**

This course involves English language consolidation in the form of lectures, tutorials and language labs. Particular emphasis on the technical environment.

Pre-requisite: UIOT 231

UIOT 242 CULTURE & COMMUNICATION IV**2.0: 2 cr. F**

In this course, the student will learn how to document, collect and analyze information, argue personal reflection, produce documents and an oral presentation

Pre-requisite: UIOT 232

UIOT 243 GENERAL ENGLISH IV**2.0: 2 cr. E**

This course focuses on training students to communicate in a technical environment. Students will learn technical related vocabulary and producing paragraphs, short essays, comprehension and analysis of both oral and written texts.

Pre-requisite: UIOT 233

UIOT 246 EXPRESSION & COMMUNICATION IV**2.0: 2 cr. F**

Scientific expression and communication in relation with concerned teaching. Elaborating folders, reports, posters, presentations, with or without a report. Elaborating a communication tool, document of synthesis, services offer with abilities, capabilities and career expectations. Papers and scientific publications analysis, audio-visual and technical documents. Learn how to analyze information in an organized manner.

Pre-requisite: UIOT 236

UIOT 247 BUSINESS ENGLISH IV**1.0: 1 cr. E**

Writing: Understanding written technical documents. Write technical documents in English. Oral: conduct an interview, Reporting techniques.

Pre-requisite: UIOT 237

UIOT 248 CULTURE & COMMUNICATION IV**1.0: 1 cr. F**

To document, collect and analyze information, Argue personal reflection. Produce documents, and oral presentation.

Pre-requisite: UIOT 238

UIOT 311 ENGLISH V**2.0: 2 cr. E**

This course involves English language consolidation in the form of lectures, tutorials and language labs. Particular emphasis on the technical environment.

Pre-requisite: UIOT 241

UIOT 312 CULTURE & COMMUNICATION V**2.0: 2 cr. F**

In this course, the student will learn how to document, collect and analyze information, argue personal reflection, produce documents and an oral presentation.

Pre-requisite: UIOT 242

UIOT 313 GENERAL ENGLISH V**2.0: 2 cr. E**

This course focuses on training students to communicate in a technical environment. Students will learn technical related vocabulary and producing paragraphs, short essays, comprehension and analysis of both oral and written texts.

Pre-requisite: UIOT 243

UIOT 316 EXPRESSION & COMMUNICATION V**2.0: 2 cr. E/F**

The objective of this course is providing the student with the capability of preparing a scientific report in written and oral versions. Knowing how to use technical documents and finally, to master the different forms of communication, regardless of the used tool.

Pre-requisite: UIOT 246

UIOT 317 BUSINESS ENGLISH V**1.0: 1 cr. E**

Writing: Understanding written technical documents. Write technical documents in English. Oral: conduct an interview, Reporting techniques.

Pre-requisite: UIOT 247

UIOT 318 CULTURE & COMMUNICATION V**1.0: 1 cr. F**

To document, collect and analyze information, Argue personal reflection. Produce documents, and oral presentation.

Pre-requisite: UIOT 248

UIOT 321 ENGLISH VI**2.0: 2 cr. E**

This course involves English language consolidation in the form of lectures, tutorials and language labs. Particular emphasis on the technical environment.

Pre-requisite: UIOT 311

UIOT 322 CULTURE & COMMUNICATION VI**2.0: 2 cr. E**

In this course, the student will learn how to document, collect and analyze information, argue personal reflection, produce documents and an oral presentation

Pre-requisite: UIOT 312

UIOT 323 GENERAL ENGLISH VI**2.0: 2 cr. E**

This course focuses on training students to communicate in a technical environment. Students will learn technical related vocabulary and producing paragraphs, short essays, comprehension and analysis of both oral and written texts. Pre-requisite: UIOT 313

UIOT 326 EXPRESSION & COMMUNICATION VI**2.0: 2 cr. F**

The objective of this course is providing the student with the capability of preparing a scientific report in written and oral versions. Knowing how to use technical documents and finally, to master the different forms of communication, regardless of the used tool.

Pre-requisite: UIOT 316

UIOT 328 CULTURE & COMMUNICATION VI**1.0: 1 cr. E**

To document, collect and analyze information, Argue personal reflection. Produce documents, and oral presentation.

Pre-requisite: UIOT 318

UIOT 350 LABOR LAW**1.0: 1 cr. E/F**

Topics include: Business Economics, Labor Law, Company Law, Accounting and Business Creation.

UIOT351 LEGISLATION & LAW**2.0: 2 cr. F**

This course covers the legal relationship between employers and employees in the private sector. The topics treated include employment contracts, leave, compensation, the trial period, the termination and benefits according to laws and regulations.

UIOT 390 GRADUATION PROJECT

3 cr. E/F

In this module students have to learn the teamwork skills that will enable them to successfully carry out a design work in the related engineering technology fields.