

**ISSAM M. FARES FACULTY 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	Associate Dean, Issam Fares Faculty of Technology
Moubayed, Walid	Dean of Admissions and Registration
Ayoub, Olga	Librarian

## **FACULTY STAFF**

Abboud, Anis	Hardware Application Specialist
Abdallah, Jean	Program Coordinator
Antoun, Sally	Laboratory Assistant
Attieh, Ghassan	Maintenance
Elias, Camelia	Administrative Assistant
Gergess, Marie-Louise	Administrative Assistant, Admissions and Registration
Hanna, Inaam	Library Assistant
Ibrahim, Nicole	Junior Accountant - Comptroller's office
Jamil, Jalil	Procurement and Services
Khoury, Ahlam	Public Relations, Orientation.
Khoury, Habib	Sporting Activities Coordinator
Khoury, Joanna	Administrative Assistant
Sahmarani, Sary	Administrative Assistant, Orientation
Wehbeh, Laura	System Administration

## **FACULTY MEMBERS**

Aad, Roula	MS, Environmental Science & Technology Lebanese University, Lebanon
Abboud, Mahassen	DEA, French Literature Lebanese University, Lebanon
Abdallah-Raad, Josiane	MS, English Linguistics USEK, Lebanon
Abdallah, Ghinwa	MS, French Literature USEK, Lebanon
Attieh, Fawaz	MS, Physics – Maths, Lyon Ecole Centrale de Paris, France
Antoun, Mireille	MS, Computer Engineering University of Balamand, Lebanon
Baes, Pamela	DEA, Lettres modernes, Dunkerque, France

Bakhit, Salma	PHD, Economical Science Université Aix-Marseille, France
Berberi, Elsy	MS, English Literature LAU
Bitar, Richard	BE, Computer & Communications Engineering NDU, Lebanon
Bittar, Angela	MS, Aircraft Maintenance IMA, Bordeaux, France
Chami, Nathalie	MS, Lettres Modernes Université Lyon 3, France
Chamsine, Mohamed	MS, Pharmacy Kharkov University, Ukraine
Chbib, Mazen	Diploma, Agricultural Engineering Lebanese University, Lebanon
Cheikh, Rola	MBA, Business Administration LAU, Lebanon
El Balaa, Rodrigue	PhD, Agricultural Sciences INPL, France
Daher, Majd	MS, English Literature USEK, Lebanon
Daher, Mireille	Masters, Genetics USEK, Lebanon
Dagher, Walid	PhD, Business Administration Université Aix-Marseille, France
Darwiche, Nisrine	MS, Computer Engineering, University of Balamand, Lebanon
El Ali, Rouba	MS, French Literature University of Balamand, Lebanon
Estephan, Salam	MS, Agriculture USEK, Lebanon
Fakher, Rim	PhD, Arboriculture & plant Protection UNIPG, Perugia, Italy
Fares, Roula	PhD, Applied Mathematics Université Jean Monnet, France
Nasr, Sandra	MS, Interior Architecture Lebanese University, Lebanon
Gerges, Berta	MA, English Language & Literature, USEK, Lebanon
Gharib, Souheir	Master, French Literature Lebanese University, Lebanon
Ghosn, Sally-Anna	DEA, Translation USEK, Lebanon
Ghazi, Georgina	MS, Electrical Engineering University of Balamand, Lebanon
Greige, Mireille	DEA, Finance USJ, Lebanon
Haddad, Dany	MS, Actuarial Science Haddad, Fares Lebanese University, Lebanon

Haddad, Fares	MS, Aeronautical Engineering ENSI Toulouse, France
Haddad, Salim	Ph.D., Information & Communication Technology Telecom Bretagne, France
Hajj Obeid, Olga	M.A., English Language Teaching University of Balamand, Lebanon
Ibrahim, Mona	Ph.D., Science of Materials Université Paul Sabatier (Toulouse 3), France
Imad, Rodrigue	Ph.D., Signal Processing and Telecommunications Telecom Bretagne, France
Issa, Rihab	Diploma, Civil Engineering Lebanese University, Lebanon
Ishak, Dany	M.S., Computer Engineering University of Balamand, Lebanon
Jreige, Joceline	Master, Management Information Lebanese University, Lebanon
Jreige, Nassim	D.E.A., Finance USEK, Lebanon
Joukhadar, Souha	M.S., Biochemistry USEK, Lebanon
Kanaan, Mohamad	Ph.D, Electronics and Optoelectronics Université de Limoges, France
Khabbazi, Tarek	M.S., International Public Law USEK, Lebanon
Karami, Nabil	M.S., Electrical Engineering University of Balamand, Lebanon
Karanouh, Sultan	B.S., Aeronautical Engineering Embry-Riddle Aeronautical University, Florida, U.S.A
Khalil, Elias	Ph.D, Physics Université de Montpellier, France
Khoury, Diana	B.S., Human Resources Griffith University, Australia
Klaiany, Joanne	M.S., Industrial Technology USJ, Lebanon
Kobrossi, Aline	M.B.A., Business Administration ULF, Lebanon
Maarawi, Sonia	Diploma, Civil Engineering Lebanese University, Lebanon
Mattar, Claudia	M.S., Electrical Engineering University of Balamand, Lebanon
Michael, Joyce	M.S., Computer Science USEK, Lebanon
Nachar, Rabih	Ph.D., Telecommunications University of Balamand, Lebanon
Naja, Ziad	Ph.D., Telecom Engineering Université Paris Sud 11, France
Najjar, Samar	Ph.D., Physics, Université Bordeaux 1, France

Nakat, Carmen	M.S., Computer Sciences University of Balamand, Lebanon
Nassour, Taghrid	M.S., Plant Biodiversity and Biotechnology USEK, Lebanon
Nasr, Maria	Ph.D., Translation ESIT, France
Nasr, Nathalie	Master, English Literature Lebanese University, Lebanon
Nehme, Anita	D.E.A., Socio-Economy Université Lumière 2 Lyon, France
Nehme, Elie	M.S., Actuarial Science & Finance USJ, Lebanon
Nehme, Gaby	Ph.D., Mechanical Engineering University of Texas, USA
Nehme, Salem	M.S., English literature Lebanese University, Lebanon
Nouhayli, Fadia	M.S., Accounting, Auditing and Control USJ, Lebanon
Raad, Robert	Ph.D., Electrical Engineering Université Laval, Canada
Rattel, Georges	M.S., Sciences in Management USJ, Lebanon
Saliba, Danielle	M.S., Electrical & Electronic Engineering Lebanese University, Roumieh, Lebanon
Safatly, Lise	Ph.D., Electrical & Computer Engineering AUB, Lebanon
Sayah, Jinane	Ph.D., Electronics Information & Systems Université Paris-Est, France
Serhan, Carole	M.B.A., Business Administration- Banking and Finance University of Balamand, Lebanon
Shanbour, Ibrahim	Ph.D., Electrical Engineering St. Petersburg, Russia
Sheikh, Hussam	Ph.D., Engine Université de Nantes, France
Tanous, Camille	M.S., Mechanical Engineering MCNeese State University, USA
Wehbe, Yara	M.A., English Language Teaching University of Balamand, Lebanon
Yaacoub, Saly	Ph.D., Physics Université de Montpellier II, France
Yammine, Vera	Teaching Diploma in the English Language Lebanese University, Lebanon

## **PROGRAMS OF STUDIES**

The Issam Fares Faculty of Technology offers three year programs leading to the Bachelor of Technology degree in the following departments:

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

With a Bachelor of Technology, the graduate is ready to begin professional practice. On the other hand, the graduate may apply to advanced studies leading to a Master's Degree in related fields, provided he/she has obtained a cumulative general average of at least 75 in the undergraduate studies; final decision on acceptance to the Master's Degree program resides with the Admissions Committee of the faculty, and successful completion of required remedial courses.

## **1. ADMISSION REQUIREMENTS**

Admission to the undergraduate program in the Issam Fares Faculty 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 a reputable university 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 English proficiency.
- e-The Faculty Admissions Committee has evaluated the applicant's qualifications for academic success in scientific and engineering subjects and approved the transfer admission.

## **2. LANGUAGE REQUIREMENTS:**

### **A. ENGLISH TRACK STUDENTS:**

Applicants to any English Track program of the Issam Fares Faculty of Technology should demonstrate proficiency in the English level. This can be done by submitting official test scores for one of the following tests: TOEFL, SAT or IELTS.

In order to be accepted in any English track program, the applicant should be placed in English level ENGL003 or above.

The table below shows English courses that should be taken by a student in any English track program, and this according to his English placement test:

English placement level	Courses that should be taken in the IFFT
ENGL 003	ENGT 103, ENGT 104, ENGT 202, ENGT 203 and ENGT 204
ENGL 101	ENGT 104, ENGT 202, ENGT 203 and ENGT 204
ENGL 102 and above	ENGT 202, ENGT 203 and ENGT 204

### **B.FRENCH TRACK STUDENTS:**

Applicants to any French Track program of the Issam Fares Faculty of Technology should demonstrate proficiency in the French level. To ascertain this proficiency, the candidate must sit for the French entrance exam and be placed in French level FREN003 or above.

In addition to the French entrance exam, applicants should sit for an English Exam (TOEFL or equivalent) in order to have an English placement level.

The table below shows English courses that should be taken by a student in any French track program, and this according to his English placement test:

English placement level	Courses that should be taken in the IFFT
ENGL001 and below	ENGT101, ENGT102 and ENGT103
ENGL002	ENGT102 and ENGT103
ENGL003	ENGT103
ENGL101 and above	No English courses are required

## **3. ACADEMIC RULES AND REGULATIONS**

### **A. EVALUATION OF ACADEMIC PERFORMANCE**

Refer to the General Section.

### **B. DEAN'S HONOR LIST**

To be placed on the Dean's honor list of the semester, a student must:

- a- Be a regular full time student registered for at least 12 credits.
- b- Have a semester major course average of 85 or above or have a semester general course average of 80 or above and rank in the top 10% of his/her class.
- c- Have no failing, withdrawals, or incomplete grades.
- d- Have no disciplinary action against him/her.
- e- Be deemed worthy by the Dean to be placed on the Honor List.

## **4. 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
<b>Total</b>		<b>15</b>

## 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
<b>Total</b>		<b>16</b>

ACMN 225	Industrial Training I	6
<b>Total</b>		<b>6</b>

## 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
<b>Total</b>		<b>17</b>

## 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
LISP 200	Library Use and Research Methods	1

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**Total** **17**

ACMN 255	Industrial Training II	6
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**Total** **6**

**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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

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**Total** **16**

**SEMESTER 6**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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

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**Total** **13**

**Total Credits** **106**

**ELECTIVES**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
ACMN 331	Aircraft Smart Materials	3
ACMN 332	CAD/CAM	3
ACMN 334	Aircraft Smart Materials	3
ACMN 323	Maintenance Organization Management	3
ACMN 327	Aviation Mathematics III	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
<b>Total</b>		<b>15</b>

### 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
<b>Total</b>		<b>16</b>
ACMN 225	Industrial Training I	6
<b>Total</b>		<b>6</b>

### 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
<b>Total</b>		<b>17</b>

### 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
LISP 200	Library Use and Research Methods	1
<b>Total</b>		<b>17</b>

ACMN 255	Industrial Training II	6
<b>Total</b>		<b>6</b>

### **SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
<b>Total</b>		<b>16</b>

### **SEMESTER 6**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
<b>Total</b>		<b>13</b>

**Total Credits** **106**

### **ELECTIVES**

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

# MECHATRONICS ENGINEERING

## 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
<b>Total</b>		<b>14</b>

### 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
<b>Total</b>		<b>14</b>

### SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 231	Probabilities	2
MECT 233	Electrical Circuits III	3
MECT 234	Linear Systems	2
TELT 231	Signal Processing	2
ENGT 202	General English III	3
	Elective course: MECT 232 or MECT 236	2
	Elective course: TELT 232 or MECT 235	3
<b>Total</b>		<b>17</b>

### 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 245	CAD design	1
TELT 224	Local Area Networks	2
ENGT 203	General English IV	3
LISP 200	Library Use and Research Methods	1
	Elective course: MECT 246 or TELT 223	3
<b>Total</b>		<b>17</b>

MECT250	Training I	4
<b>Total</b>		<b>4</b>

### **SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 311	Robotics	2
MECT 312	Digital Signal Processing (DSP)	3
MECT 313	Mechatronics II	3
UIOT 350	Labor Law	1
ENGT 204	General English V	2
	Elective course: MECT 314 or MECT 315	3
	Elective course: MECT 316 or TELT 234	2
	Elective course: MECT 244 or MECT 317	1
<b>Total</b>		<b>18</b>

### **SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 324	Renewable Energy	3
MECT 328	Electrical Installations	1
UIOT 390	Graduation Project	3
	Elective course: MECT 325 or TELT 241	3
	Elective course: MECT 326 or MECT 327	2
<b>Total</b>		<b>12</b>

MECT350	Training II	4
<b>Total</b>		<b>4</b>

**Total credits** **106**

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

### **ELECTIVES**

#### **SEMESTER 3**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 232	Optoelectronics
MECT 236	Statics
MECT 235	Science of Materials
TELT 232	Analysis and Design of Logic Systems

#### **SEMESTER 4**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 246	Dynamics
TELT 223	Analog Communications

**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 314	Industrial Automation 2
MECT 315	Thermodynamics
MECT 316	Mechanics of Materials
TELT 234	Routing and Switching Essentials
MECT 244	Methodology
MECT 317	CAD design 2

**SEMESTER 6**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 325	Fluid Mechanics
TELT 241	Java
MECT 326	Fundamentals of Management and Economics
MECT 327	Fuzzy Logic Control

## **MECHATRONICS ENGINEERING**

### **FRENCH TRACK**

**SEMESTER 1**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
FRET 201	Culture & Communication 1	2
<b>Total</b>		<b>16</b>

**SEMESTER 2**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
FRET 202	Culture & Communication 2	2
<b>Total</b>		<b>16</b>

**SEMESTER 3**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 231	Probabilities	2

MECT 233	Electrical Circuits III	3
MECT 234	Linear Systems	2
TELT 231	Signal Processing	2
FRET 203	Culture & Communication 1	2
	Elective course: MECT 232 or MECT 236	2
	Elective course: TELT 232 or MECT 235	3
<b>Total</b>		<b>16</b>
<b><u>SEMESTER 4</u></b>		
<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 241	Calculus II	2
MECT 242	Control Systems	2
MECT 243	Mechatronics I	3
MECT 245	CAD Design	1
TELT 224	Local Area Networks	2
FRET 204	Culture & Communication 4	3
LISP 200	Library Use and Research Methods	1
	Elective course: MECT 246 or TELT 223	3
<b>Total</b>		<b>17</b>
MECT 250	Training	4
<b><u>SEMESTER 5</u></b>		
<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 311	Robotics	2
MECT 312	Digital Signal Processing (DSP)	3
MECT 313	Mechatronics II	3
UIOT 350	Labor Law	1
	Elective course: MECT 314 or MECT 315	3
	Elective course: MECT 316 or TELT 234	2
	Elective course: MECT 244 or MECT 317	1
<b>Total</b>		<b>18</b>
<b><u>SEMESTER 6**</u></b>		
<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 324	Renewable Energy	3
MECT 328	Electrical Installations	1
UIOT 390	Graduation Project	3
	Elective course: MECT 325 or TELT 241	3
	Elective course: MECT 326 or MECT 327	2
<b>Total</b>		<b>12</b>
MECT 350	Training II	4
<b>Total credits</b>		<b>100</b>



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

**ELECTIVES :**

**SEMESTER 3**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 232	Optoelectronics
MECT 236	Statics
MECT 235	Science of Materials
TELT 232	Analysis and Design of Logic Systems

**SEMESTER 4**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 246	Dynamics
TELT 223	Analog Communications

**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 314	Industrial Automation 2
MECT 315	Thermodynamics
MECT 316	Mechanics of Materials
TELT 234	Routing and Switching Essentials
MECT 244	Methodology
MECT 317	CAD design 2

**SEMESTER 6**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 325	Fluid Mechanics
TELT 241	Java
MECT 326	Fundamentals of Management and Economics
MECT 327	Fuzzy Logic Control

**TELECOMMUNICATIONS & NETWORKS ENGINEERING**  
**ENGLISH TRACK**

**SEMESTER 1**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
<b>Total</b>		<b>14</b>

**SEMESTER 2**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
<b>Total</b>		<b>15</b>

**SEMESTER 3**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
ENGT 202	General English 3	3
	Elective course: MECT 232 or TELT 235	2
<b>Total</b>		<b>15</b>

**SEMESTER 4**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 241	Calculus II	2
MECT 245	CAD Design	1
TELT 241	Java	3
TELT 242	Information Theory	3
TELT 243	Switching in Local Networks	2
ENGT 203	General English 4	3
LISP 200	Library Use and Research Methods	1
	Elective course: TELT 244 or TELT 245 or MECT 326	2
<b>Total</b>		<b>17</b>

TELT 250      Training I      4

**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 244	Methodology	1
TELT 311	Operating Systems	2
TELT 312	Internet technology	3
TELT 313	Network security	3
TELT 314	Satellites and Radars	3
ENGT 204	General English 5	3
UIOT 350	Labor Law	1
	Elective course: TELT 315 or TELT 316	2
<b>Total</b>		<b>18</b>

**SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
<b>Total</b>		<b>12</b>
TELT 350	Training II	4
<b>Total credits</b>		<b>100</b>

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

**ELECTIVES****SEMESTER 3**

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

**SEMESTER 4**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 326	Fundamentals of Management and Economics
TELT 244	Fixed Telephony
TELT 245	Antennas and Propagation

**SEMESTER 5**

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

**SEMESTER 6**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
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>
FRET 201	Culture & Communication 1	2
MECT 211	Calculus I	3
MECT 212	General Physics	2
MECT 213	Electrical Circuits I	3
TELT 211	Programming I	2
TELT 212	Computer & Internet	1
TELT 213	Digital Electronics	3
<b>Total</b>		<b>16</b>

### SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
FRET 202	Culture & Communication 1	2
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
<b>Total</b>		<b>17</b>

### 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
FRET203	Culture & Communication 3	2
	Elective course: MECT232 or TELT235	2
<b>Total</b>		<b>15</b>

### SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
MECT 241	Calculus II	2
MECT 245	CAD Design	1
TELT 241	Java	3
TELT 242	Information Theory	3
TELT 243	Switching in Local Networks	2
FRET 204	Culture & Communication 4	3
LISP 200	Library Use and Research Methods	1
	Elective course: TELT 244 or TELT 245 or MECT 326	2
<b>Total</b>		<b>17</b>

TELT 250	Training I	4
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**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
MECT 244	Methodology	1
TELT 311	Operating Systems	2
TELT 312	Internet technology	3
TELT 313	Network security	3
TELT 314	Satellites and Radars	3
UIOT 350	Labor Law	1
	Elective course: TELT315 or TELT316	2
<b>Total</b>		<b>15</b>

**SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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	3
<b>Total</b>		<b>12</b>

TELT 350	Training II	4
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<b>Total credits</b>	<b>100</b>
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**(\*\*) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.**

**ELECTIVES**

**SEMESTER 3**

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

**SEMESTER 4**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>
MECT 326	Fundamentals of Management and Economics
TELT 244	Fixed Telephony
TELT 245	Antennas and Propagation

**SEMESTER 5**

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

**SEMESTER 6**

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

**CIVIL ENGINEERING AND CONSTRUCTION**  
**FRENCH TRACK**

**SEMESTER 1**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
CIVT 211	Statics	3
CIVT 212	Principles of Programming	2
CIVT 222	Science of Materials	3
FRET 201	Culture & Communication 1	2
MECT 211	Calculus 1	3
TELT 212	Computer and Internet	1
<b>Total</b>		<b>14</b>

**SEMESTER 2**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
CIVT 221	General Applied Chemistry	3
CIVT 225	Geology	3
CIVT 223	Mechanics of Materials	3
FRET 202	Culture & Communication 2	2
MECT 221	Linear Algebra	3
MECT 241	Calculus 2	2
<b>Total</b>		<b>16</b>

**SEMESTER 3**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
CIVT 224	Technical Drawing	1
CIVT 233	Theory of Structures 1	3
CIVT 234	Workshop Technology	1
CIVT 312	Construction Materials & Methods	3
FRET 203	Culture & Communication 3	2
MECT 231	Probabilities	2
MECT 315	Thermodynamics	3
<b>Total</b>		<b>15</b>

**SEMESTER 4**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
CIVT 241	HVAC Principles and Equipment	3

CIVT 242	Topography and Surveying	2
CIVT 243	Soil Mechanics & Foundation	3
CIVT 244	Reinforced Concrete 1	3
CIVT 246	Strength of Materials Laboratory	1
FRET 204	Culture & Communication 4	3
LISP 200	Library Use and Research Methods	1
MECT 325	Fluid Mechanics	3

<b>Total</b>		<b>19</b>
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CIVT250	Training 1	4
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#### **SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
CIVT 313	Transportation Engineering	3
CIVT 314	Construction Management	2
CIVT 315	Building Law	2
CIVT 317	Construction Management Lab	1
CIVT 318	Transportation Engineering Lab	1
CIVT 321	Reinforced Concrete 2	3
CIVT 327	Introduction to Environmental Engineering	3

<b>Total</b>		<b>15</b>
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#### **SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
CIVT 245	Geotechnical Engineering Lab	1
CIVT 311	Foundation Design	3
CIVT 316	Engineering Economy	2
CIVT 322	Sanitary Engineering	3
CIVT 326	Structural Analysis Lab	1
UIOT 390	Graduation Project	3

<b>Total</b>		<b>13</b>
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CIVT250	Training 2	4
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<b>Total credits</b>		<b>107</b>
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(\*) Based on the placement level, the student can be exempted from this course.

(\*\*) Semester VI is divided into two parts: eleven weeks are dedicated for courses and four weeks for Training 2.

# **BUSINESS MANAGEMENT AND ADMINISTRATION**

## **FRENCH TRACK**

### **SEMESTER 1**

<u><b>Course Code</b></u>	<u><b>Course</b></u>	<u><b>Credit</b></u>
BUST 211	Applied Business Mathematics	3
BUST 212	Financial Accounting 1	3
BUST 213	Microeconomics	3
BUST 215	Information Technology	3
FRET 201	Culture and Communication 1	2
<b>Total</b>		<b>14</b>

### **SEMESTER 2**

<u><b>Course Code</b></u>	<u><b>Course</b></u>	<u><b>Credit</b></u>
BUST 221	Financial Accounting 2	3
BUST 222	Management Principles & Ethics	3
BUST 223	Analytical Accounting	3
BUST 224	Statistics & Probabilities	3
BUST 226	Mathematics of Finance	3
FRET 202	Culture and Communication 2	2
<b>Total</b>		<b>17</b>

### **SEMESTER 3**

<u><b>Course Code</b></u>	<u><b>Course</b></u>	<u><b>Credit</b></u>
BUST 231	Macroeconomics	3
BUST 232	Advanced Accounting	3
BUST 233	Business Law	3
BUST 234	Financial Analysis	3
FRET 203	Culture and Communication 3	2
<b>Total</b>		<b>17</b>

### **SEMESTER 4**

<u><b>Course Code</b></u>	<u><b>Course</b></u>	<u><b>Credit</b></u>
BUST 341	Marketing Principles	3
BUST 342	Accounting Standards	2
BUST 343	Companies Accounting	2
BUST 344	Financial Management	3
BUST 346	Taxation And VAT	2
BUST 349	Research Methods	2
FRET 204	Culture & Communications 4	3
LISP 200	Library Use and Research Methods	1
<b>Total</b>		<b>18</b>



BUST 250	Training I	4
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**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course</u></b>	<b><u>Credit</u></b>
BUST 351	Human Resources Management	3
BUST 352	Management Control & Budget	3
BUST 353	International Trading	3
BUST 354	International Finance	3
	Elective Course: BUST 357 or BUST 358	3
<b>Total</b>		<b>15</b>

**SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course</u></b>	<b><u>Credit</u></b>
BUST 362	Banking & Finance	2
BUST 363	Auditing	2
BUST 365	Operation research	2
BUST 366	Quantative Techniques applied to Business(SPSS)	2
UIOT 390	Graduation Porject	3
	Elective Course: BUST 368 or BUST 369	3
<b>Total</b>		<b>15</b>

BUST350	Training II	4
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<b>Total credits</b>		<b>107</b>
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**(\*\*) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.**

**ELECTIVES**

**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course</u></b>
BUST 357	Business Evaluation
BUST 358	Principales of e-commerce

**SEMESTER 6**

<b><u>Course Code</u></b>	<b><u>Course</u></b>
BUST 368	Financial Engineering
BUST 369	Strategic Management

# **BUSINESS MANAGEMENT AND ADMINISTRATION** **ENGLISH TRACK**

## **SEMESTER 1**

<u><b>Course Code</b></u>	<u><b>Course</b></u>	<u><b>Credit</b></u>
BUST 211	Applied Business Mathematics	3
BUST 212	Financial Accounting 1	3
BUST 213	Microeconomics	3
BUST 215	Information Technology	3
ENGT 103	General English 1(*)	3
<b>Total</b>		<b>15</b>

## **SEMESTER 2**

<u><b>Course Code</b></u>	<u><b>Course</b></u>	<u><b>Credit</b></u>
BUST 221	Financial Accounting 2	3
BUST 222	Management Principles & Ethics	3
BUST 223	Analytical Accounting	3
BUST 224	Statistics & Probabilities	3
BUST 226	Mathematics of Finance	3
<b>Total</b>		<b>18</b>

## **SEMESTER 3**

<u><b>Course Code</b></u>	<u><b>Course</b></u>	<u><b>Credit</b></u>
BUST 231	Macroeconomics	3
BUST 232	Advanced Accounting	3
BUST 233	Business Law	3
BUST 234	Financial Analysis	3
ENGT 202	General English 3	3
<b>Total</b>		<b>15</b>

## **SEMESTER 4**

<u><b>Course Code</b></u>	<u><b>Course</b></u>	<u><b>Credit</b></u>
BUST 341	Marketing Principles	3
BUST 342	Accounting Standards	2
BUST 343	Companies Accounting	2
BUST 344	Financial Management	3
BUST 346	Taxation	2
BUST 349	Research Methods	2
ENGT 203	General English 4	3
LISP 200	Library Use and Research Methods	1
<b>Total</b>		<b>18</b>

BUST 250	Training I	4
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**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course</u></b>	<b><u>Credit</u></b>
BUST 351	Human Resources Management	3
BUST 352	Management Control & Budget	3
BUST 353	International Trading	3
BUST 354	International Finance	3
ENGT 204	General English 5	3
	Elective Course: BUST 357 or BUST 358	3
<b>Total</b>		<b>18</b>

**SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course</u></b>	<b><u>Credit</u></b>
BUST 362	Banking & Finance	2
BUST 363	Auditing	2
BUST 365	Operation Research	2
BUST 366	Quantative Techniques applied to Business(SPSS)	2
UIOT 390	Graduation Porject	3
	Elective Course: BUST 368 or BUST369	3
<b>Total</b>		<b>14</b>

BUST350	Training II	4
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<b>Total credits</b>		<b>100</b>
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(\*\*) Semester 6 is divided into two parts: Seven weeks are dedicated for courses and eight weeks for Training II.

**ELECTIVES**

**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course</u></b>
BUST 357	Business Evaluation
BUST 358	Principales of e-commerce

**SEMESTER 6**

<b><u>Course Code</u></b>	<b><u>Course</u></b>
BUST 368	Financial Engineering
BUST 369	Strategic Management

# AGRICULTURE ENGINEERING

## FRENCH TRACK

### SEMESTER 1

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 220	Applied and General Physics	2
AGRT 221	Cellular biology and histology	3
AGRT 223	General Chemistry	2
AGRT 224	Organic and Analytical Chemistry	2
AGRT 225	Microbiology and Immunology	2
AGRT 227	Applied Calculus	2
AGRT 230	Computer Tools	1
FRET 201	Culture & Communication 1	2
<b>Total</b>		<b>16</b>

### SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 236	Adaptation to the professional environment	1
AGRT 237	Zoology	2
AGRT 238	Agrophysiology	2
AGRT 239	Molecular biology	3
AGRT 240	Biotechnologies	2
AGRT 242	Statistics	2
AGRT 246	Food Industry Engineering	2
FRET 202	Culture & Communication 2	2
<b>Total</b>		<b>16</b>

### SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 260	Animal Physiology	2
AGRT 261	Introduction to Biochemistry	2
AGRT 263	Data Analysis – Methodology	2
AGRT 265	Natural and Transformed ecosystems	2
AGRT 266	Production Management	1
AGRT 267	Genetics applied to agriculture	2
AGRT 271	Quality - Supply Chain	2
AGRT 272	Soils - plants - climate system	2
FRET 203	Culture & Communication 3	2
<b>Total</b>		<b>17</b>

### 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 277	Agricultural engineering	3

AGRT 278	Accounting & Finance	3
AGRT 279	Physiology & Production	3
FRET 204	Culture & Communication 4	3
<b>Total</b>		<b>17</b>

AGRT 250	Training 1	4
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#### **SEMESTER 5 (ANIMAL PRODUCTION)**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
AGRT 320	Farm and Territorial Analysis	3
AGRT 323	Zootechnics	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
LISP 200	Library Use and Research Methods	1
<b>Total</b>		<b>15</b>

#### **SEMESTER 5 (FOOD INDUSTRY)**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
AGRT 311	Detailed Biochemistry	2
AGRT 312	Advanced Food Industry	2
AGRT 313	Law and legislation	1
AGRT 315	Microbiology & Bioproduction	2
AGRT 316	Optional Module 1	2
AGRT 317	Optional Module 2	2
AGRT 318	International Trading	2
AGRT 319	Tutored Project	2
LISP 200	Library Use and Research Methods	1
<b>Total</b>		<b>16</b>

#### **SEMESTER 5 (PLANT PRODUCTION)**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
AGRT 324	Business and Project Management	3
AGRT 325	Rural Development	3
AGRT 326	Economic and Social Development	2
AGRT 327	Diagnostics & Analysis	2
AGRT 332	Quality Development	3
AGRT 338	From diagnostics to projects	2
LISP 200	Library Use and Research Methods	1
<b>Total</b>		<b>16</b>

#### **SEMESTER 5 (SUSTAINABLE AGRICULTURE AND FOOD INDUSTRY)**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
AGRT 312	Advanced Food Industry	2
AGRT 323	Zootechnics	3

AGRT 325	Rural Development	3
AGRT 326	Economic and Social Development	2
AGRT 328	Development and Quality Control	3
AGRT 338	From diagnostics to projects	2
LISP 200	Library Use and Research Methods	1
<b>Total</b>		<b>16</b>

**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	2
AGRT 334	Food Systems	3
UIOT 390	Graduation project	3
<b>Total</b>		<b>10</b>

**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
<b>Total</b>		<b>10</b>

**SEMESTER 6 (PLANT PRODUCTION)\*\***

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 329	Business Knowledge	3
AGRT 333	Biological engineering	2
AGRT 340	Sustainable development	2
UIOT 390	Graduation project	3
<b>Total</b>		<b>10</b>

**SEMESTER 6 (SUSTAINABLE AGRICULTURE AND FOOD INDUSTRY)\*\***

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
AGRT 340	Sustainable development	2
AGRT 342	Total quality management	2
AGRT 334	Food Systems	3
UIOT 390	Graduation project	3
<b>Total</b>		<b>10</b>

AGRT350	Training 2	4
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**Total credits** **100**

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

# CIVIL ENGINEERING AND CONSTRUCTION

## ENGLISH 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 222	Science of Materials	3
MECT 211	Calculus 1	3
TELT 212	Computer and Internet	1
<b>Total</b>		<b>12</b>

### SEMESTER 2

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 221	General Applied Chemistry	3
CIVT 225	Geology	3
CIVT 223	Mechanics of Materials	3
MECT 221	Linear Algebra	3
MECT 241	Calculus 2	2
<b>Total</b>		<b>14</b>

### SEMESTER 3

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 224	Technical Drawing	1
CIVT 233	Theory of Structures 1	3
CIVT 234	Workshop Technology	1
CIVT 312	Construction Materials & Methods	3
ENGT 202	General English 3	3
MECT 231	Probabilities	2
MECT 315	Thermodynamics	3
<b>Total</b>		<b>16</b>

### SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
CIVT 241	HVAC Principles and Equipment	3
CIVT 242	Topography and Surveying	2
CIVT 243	Soil Mechanics & Foundation	3
CIVT 244	Reinforced Concrete 1	3
CIVT 246	Strength of Materials Laboratory	1
ENGT 203	General English 4	3
LISP 200	Library Use and Research Methods	1
MECT 325	Fluid Mechanics	3
<b>Total</b>		<b>19</b>

CIVT250	Training 2	4
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**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
CIVT 313	Transportation Engineering	3
CIVT 314	Construction Management	2
CIVT 315	Building Law	2
CIVT 317	Construction Management Lab	1
CIVT 318	Transportation Engineering Lab	1
CIVT 321	Reinforced Concrete 2	3
CIVT 327	Introduction to Environmental Engineering	3
ENGT 204	General English 5	3
<b>Total</b>		<b>18</b>

**SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
CIVT 245	Geotechnical Engineering Lab	1
CIVT 311	Foundation Design	3
CIVT 316	Engineering Economy	2
CIVT 322	Sanitary Engineering	3
CIVT 326	Structural Analysis Lab	1
UIOT 390	Graduation Project	3
<b>Total</b>		<b>13</b>

CIVT250	Training 1	4
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**Total credits** **100**

(\*\*) Semester VI is divided into two parts: eleven weeks are dedicated for courses and four weeks for Training 2.



# 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	Math2	3
INFT 215	Programming 1	3
<b>Total</b>		<b>14</b>

### 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 2	2
INFT 224	Human Computer Interaction	2
INFT 225	Programming Methodology	2
INFT 312	Digital Logic	3
<b>Total</b>		<b>15</b>

### 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
ENGT 202	General English 3	3
<b>Total</b>		<b>18</b>

### SEMESTER 4

<u>Course Code</u>	<u>Course Title</u>	<u>Credit</u>
INFT 241	Systems Analysis & Design	3
INFT 243	Switching in LANs	2
INFT 244	Java Technology	2
INFT 245	Multimedia Programming	2
INFT 246	Database Systems Management	3
ENGT203	General English 4	3
LISP200	Library Use and Research Methods	1
<b>Total</b>		<b>16</b>

INFT 250	Training I	4
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**SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
INFT 242	Software Processing	2
INFT 311	Software Quality	3
INFT 313	Platform Technologies	3
INFT 314	Security Issues & Principles	3
INFT 315	Technical Support	3
ENGT 204	General English 5	3
<b>Total</b>		<b>17</b>

**SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
INFT 321	Network Configuration	3
INFT 322	Digital Media Development	3
INFT 323	Systems Administration	3
INFT 324	Graduation Project	3
<b>Total</b>		<b>12</b>

INFT 350	Training II	4
<b>Total credits</b>		<b>100</b>

(\*\*) 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**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
INFT 211	End User Computing	3
INFT 212	Programming Methodology	2
INFT 213	Discrete Mathematics	3
INFT 214	Open Source Software	3
INFT 215	Programming I	2
FRET 201	Culture & Communication 1	2
<b>Total</b>		<b>16</b>

**SEMESTER 2**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
INFT 221	Operating System	3

INFT 222	Open Source Software	3
INFT 223	Programming II	2
INFT 224	Human Computer Interaction	2
INFT 225	Introduction to Business	3
INFT 312	Digital Logic	3
FRFT 202	Culture & Communication 2	2
<b>Total</b>		<b>17</b>

### **SEMESTER 3**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
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
FRFT 203	Culture & Communication 3	2
<b>Total</b>		<b>17</b>

### **SEMESTER 4**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
INFT 241	Systems Analysis & Design	3
INFT 243	Switching in LANs	2
INFT 244	Java Technology	2
INFT 245	Multimedia Programming	2
INFT 246	Database Systems Management	3
FRET 204	Culture & Communication 4	3
LISP 200	Library Use and Research Methods	1
<b>Total</b>		<b>16</b>

INFT 250	Training I	4
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### **SEMESTER 5**

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
INFT 242	Software Processing	2
INFT 311	Software Quality	3
INFT 313	Platform Technologies	3
INFT 314	Security Issues & Principles	3
INFT 315	Technical Support	3
<b>Total</b>		<b>14</b>

### **SEMESTER 6\*\***

<b><u>Course Code</u></b>	<b><u>Course Title</u></b>	<b><u>Credit</u></b>
INFT 321	Network Configuration	3
INFT 322	Digital Media Development	3

INFT 323	Systems Administration	3
INFT 324	Graduation Project	3
<b>Total</b>		<hr/> 12
INFT 350	Training II	4
<b>Total credits</b>		<b>104</b>

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

## **COURSE DESCRIPTIONS**

### **ACMN 211 AVIATION MATHEMATICS**

**3.0: 3 cr. E**

Arithmetical terms, measures and conversion factors, ratio and proportion, averages and percentages, areas and volumes, squares, cubes, square and cube roots, simple algebraic fractions, linear equations, indices and powers, negative and fractional indices, binary and other applicable numbering systems, simultaneous equations, second degree equations 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, molecules; states, forces, moments and couples, representation as vectors, center of gravity, elements of theory of stress, strain and elasticity, linear movement, rotational movement, periodic motion, gyroscopic principles, friction, dynamic and total pressure, temperature, heat transfer, first and second law of thermodynamics, gases, laws of reflection and refraction, wave motion, sound.

### **ACMN 213 ELECTRICAL ENGINEERING FUNDAMENTALS**

**3.0: 3 cr. E**

Structure and distribution of electrical charges, units of charge, Coulomb's law, conduction of electricity, production of electricity, construction and basic chemical action; operation of photo-cells, Ohm's law, Kirchoff's Voltage and Current Laws, construction of Wheatstone Bridge, power, work and energy, operation and function of a capacitor, theory of magnetism, DC generator, AC theory, RLC circuits, Transformers, Filters, AC generators, AC motors.

### **ACMN 214 BASIC AERONAUTICS AND AERODYNAMICS**

**3.0: 3 cr. E**

Physics of the atmosphere, International Standard Atmosphere, aerodynamic forces, flow around a body, boundary layer, up- and down-wash, airfoil geometry, wash in and wash out, thrust, weight and aerodynamic resultant, airfoil contamination including ice, snow and frost, Theory of Flight, performance, flight envelope and structural limitations, longitudinal, lateral and directional stability (passive and active).

### **ACMN 221 ELECTRONIC FUNDAMENTALS**

**3.0: 3 cr. E**

Semiconductors, Materials, electron configuration, electrical properties, P and N type materials and junction, Diode parameters, rectifiers, diode, Transistors, construction and operation of PNP NPN and other type transistors, applications and simple circuits, Integrated circuits, description and operation of logic circuits, linear circuits and operational amplifiers, Printed circuit boards, Servomechanisms, E and I transformers, inductance and capacitance transmitters, Servomechanism defects, lead reversal and hunting.

### **ACMN 222 MATERIALS AND HARDWARE**

**3.0: 3 cr. E**

Ferrous aircraft materials, Non-Ferrous aircraft materials, Composites and non-metallic aircraft materials, identification of common alloy steels used in aircraft, sealant and bonding agents, Wooden structures, preservation and maintenance of wooden structures, Fabric covering, Corrosion, formation, identification, causes, Fasteners, screws, bolts, studs and nuts, Locking devices, Rivets, Pipes and Unions, Springs, Bearings, Transmissions, Control Cables, Electrical Cables and Connectors.

### **ACMN 223 MAINTENANCE PRACTICES I**

**3.0: 3 cr. E**

Safety Precautions-Aircraft and Workshop, Workshop Practices, Tools, Engineering Drawings, Diagrams and Standards, ATA 100 and other applicable standards including AN, MS, NAS and MIL, Fits and Clearances, Riveting, Pipes and Hoses, Springs, Sheet Metal: Marking out and calculation of bending allowance, bending and forming, inspection. Welding, Brazing, 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 programs 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**

Matrices and Determinants, Linear Simultaneous Equations, Matrix Arithmetic, Eigenvalues and Eigenvectors, Coordinate Transformation, Determinants, Properties, Properties of Determinants and Numerical Solution of Linear Equations, Differential Equations, Laplace Transforms, The general linear first and second order ordinary differential equations ODE, Solving linear second order ordinary differential equations with constant coefficients. Orthogonal functions including Legendre and trigonometric functions.

**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, Physical environment, Tasks, Communication, Human error, Hazards in the workplace, Regulatory framework, role of ICAO and EASA, relationships between Parts 145, 66, 147 and M, relationship with other aviation authorities, maintenance staff certification, approved maintenance organizations.

**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, Effects of wing fences, Boundary layer control, Operation and effect of trim tabs, High speed flight, Mach number, critical 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, Engine Performance, Inlets, Compressors, Combustion Section, Turbine Section, Exhaust, Engine noise reduction, thrust reversers, Bearings and Seals, Lubrication Systems, Fuel Systems, Air Systems, Starting and Ignition Systems, Engine Indicating Systems: Exhaust Gas Temperature, Interstage Turbine Temperature, Engine thrust indication.

**ACMN 234 DIGITAL TECHNIQUES AND INSTRUMENTATION****3.0: 3 cr. E**

Electronic Instrument Systems, Numbering Systems, Data Conversion, Data Buses, Logic Circuits, Basic Computer Structure, Microprocessors, Integrated Circuits, Multiplexing, Fibre Optics. Electronic Displays, Cathode ray tubes, light emitting diodes, liquid crystal displays. Electrostatic Sensitive Devices, Software Management Control, Electromagnetic Environment, Typical Electronic/Digital Aircraft Systems.

**ACMN 235 MAINTENANCE PRACTICES II****3.0: 3 cr. E**

Avionics General Test Equipment, Electrical Cables and Connectors, Bearings, Transmissions, Control Cables: Swaging 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, 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, turbofan, turboshaft and turboprop engines, Fundamentals: Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle, force, work, energy, velocity, acceleration, construction and operation of turbojets, turbofans, turboshafts and turboprops. Engine Performance, Inlets, Compressors, Combustion Section, Turbine Section, Exhaust, Lubricants and Fuels, Lubrication Systems, Fuel Systems, Air Systems, Starting and Ignition Systems, Engine Indicating Systems.

**ACMN 241 TURBINE AEROPLANE STRUCTURES****3.0: 3 cr. E**

Airworthiness requirements for structural strength, structural classification (primary, secondary, tertiary), Zonal and station identification systems, Stress and strain, Drains and ventilation provisions, Lightning strike protection provision, Construction methods of stressed skin fuselage, Structure assembly techniques, Methods of surface protection, Airframe symmetry, Fuselage (ATA 52/53/56) Construction and pressurization sealing, Seat installation and cargo loading system, Windows and windscreen construction and mechanisms. Wings (ATA 57) construction, Stabilizers (ATA 55), Flight control surfaces (ATA 55/57), Nacelles/Pylons (ATA 54).

**ACMN 242 TURBINE AEROPLANE SYSTEMS****3.0: 3 cr. E**

Air supply, Safety and warning devices, systems (ATA 31), Gyroscopic systems, Compasses, Angle of attack indication, Other aircraft system indication, Avionic systems, Electrical Power, DC power generation, AC power generation, Equipment and Furnishings (ATA 25), Cabin layout, Equipment layout, Fire Protection (ATA 26), Flight Controls (ATA 27), Fuel Systems (ATA 28), Hydraulic Power (ATA 29), Ice and Rain Protection (ATA 30), Landing Gear (ATA 32), Lights (ATA 33), Oxygen (ATA 35), Pneumatic/Vacuum (ATA 36), Water/Waste (ATA 38), On Board Maintenance Systems (ATA 45).

**ACMN 243 GAS TURBINE ENGINES II****3.0: 3 cr. E**

Power Augmentation Systems, Turbo-prop Engines, Turbo-shaft Engines, Auxiliary Power Units, Power plant Installation, Fire Protection Systems, Engine Monitoring and Ground Operation, Engine Storage and Preservation.

**ACMN 244 PROPELLERS****3.0: 3 cr. E**

Fundamentals, Propeller Construction, Pitch Control, Propeller Synchronization, Ice Protection, Propeller Maintenance, Storage and Preservation, Propeller Storage and Preservation.

**ACMN 245 MAINTENANCE PRACTICES III****3.0: 3 cr. E**

Aircraft Weight and Balance, Aircraft Handling and Storage, Inspection, Repair and Assembly Techniques, General repair methods, Non-destructive testing techniques including dye penetration, radiography, eddy current, ultrasonic and boroscope methods, Disassembly and re-assembly techniques, Abnormal Events, Maintenance 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), Automatic Landing Systems, Communication/Navigation (ATA 23/34), Working principles of VHF and HF communication, Electrical Power (ATA 24), Equipment and Furnishings, Flight Controls (ATA 27), Fly-by-wire systems, Instrument Systems: (ATA 31), Lights (ATA 33), Internal lights, Emergency lights, On Board Maintenance Systems (ATA 45).

### **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.

### **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.

### **ACMN 312 HELICOPTER STUDIES I**

**3.0: 3 cr. E**

Theory of Flight-Rotary Wing Aerodynamics, Flight Control Systems and system operation: manual, hydraulic and fly-by-wire, artificial feel, balancing and rigging. 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 MAINTENANCE 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, Engine Performance, Engine Construction, Engine Fuel Systems, Injection Systems, Electronic Engine Control, Starting and Ignition Systems, Induction, Exhaust and Cooling Systems, Supercharging/Turbocharging, Lubricants and Fuels, Lubrication Systems, Engine Indication Systems, Power plant Installation,



Engine Monitoring and Ground Operation, Engine Storage and Preservation.

**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**

Basic statistics. Correlation and linear regression: Graphic illustration of possible link which can exist between two quantitative variables, covariance. Determination of the linear regression line by ordinary mean square error method. Definition and properties of linear correlation coefficient. Elements of combinatory analysis and probability, Arrangement, Permutation and Combination, Discrete and continuous random variables. Binomial distribution, Poisson distribution, Normal distribution, Special continuous distributions. Estimation and parametric test. Pearson's correlation test.

**ACMN 331 AIRCRAFT SMART MATERIALS**

**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 INTERIORS****3.0: 3 cr. E**

Fundamental properties of aircraft composite materials, performance characteristics, design considerations, maintenance practices & repair procedures. Use of composite materials in modern aircraft structures, composites materials currently in use, basic laminate design, theory behind the function and construction of a fiber laminate aircraft structure, health and safety considerations, 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 220 APPLIED AND GENERAL PHYSICS****2.0: 2 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. 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. It also includes notions of metrology, units and dimensions. Basic concepts include fluid mechanics, thermodynamics, electricity and optical studies.

**AGRT 221 CELLULAR BIOLOGY AND HISTOLOGY****3.0: 3 cr. F**

This course covers cellular biology (organization & functioning of the eukaryote cells). It also covers the basic components of different animal tissues and how do they fit into the organs functioning.

**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 225 MICROBIOLOGY & IMMUNOLOGY** **2.0: 2 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 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 237 ZOOLOGY****2.0: 2 cr. F**

Studying the major categories of the animal reign especially fish, mammals, amphibians, insects, mollusques, their body composition and functioning. The course relies on intense dissectional program allowing students to get acquainted with animal autopsies.

**AGRT 238 AGROPHYSIOLOGY****2.0: 2 cr. 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 239 MOLECULAR BIOLOGY****3.0: 3 cr. F**

Proteins, lipids, sugars and nucleic acid composition as a unit and as complex molecules Definition and application of molecular biology tools. Initiation to biometric techniques.

**AGRT 240 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 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 1****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 260 ANIMAL PHYSIOLOGY****2.0: 2 cr. F**

Studying the functioning of major animal systems such as blood, circulation, respiration, urinary, digestive, nervous and muscular systems.

**AGRT 261 INTRODUCTION TO BIOCHEMISTRY****2.0: 2 cr. F**

The process of major biochemical activities in the biological world such as DNA copy and transfer to cytoplasm, protein production, photosynthesis, Krebs cycle, glycolysis, etc.

Prerequisite: AGRT 239

**AGRT 263 DATA ANALYSIS - METHODOLOGY****2.0: 2 cr. 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.

Prerequisite: AGRT 242.

**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.

Agrometeorology, 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 266 PRODUCTION MANAGEMENT****1.0: 1 cr. F**

The objective of this course is to enhance the knowledge of the students in the enterprise production management and make them more familiar in the economic techniques for a better production chain management. Starting from the raw materials purchased from the suppliers, to finished goods and then offered to the client.

**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 SOILS – PLANTS – CLIMATE 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 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 278 ACCOUNTING & FINANCE**

**3.0: 3 cr. F**

This course offers elements of agricultural accounting, forecasts, predictions and investments as well as the basics of economic and management studies. It also focuses on operations of commercial banks and covers credit analysis, investment policy, liquidity, business loans and consumer and repository management regarding monetary policy.

**AGRT 279 PHYSIOLOGIE AND 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. F**

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 ADVANCED FOOD INDUSTRY**

**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 315 MICROBIOLOGY & BIOPRODUCTION**

**2.0: 2 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 318 INTERNATIONAL TRADING**

**2.0: 2 cr. F**

The objective is to illustrate for the students the importance of the international trading (Exportation-Importation) for the enterprise, and to notify them about the international trading risks including the transportation and the uses of different currencies, also to explain for them the techniques that protect them from these risks.

### **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.

Knowing and performing different tests relevant to milk and dairy products including, hygienic and qualitative tests, such as bacterial count, antibiotic presence, dry matter percentage, fat content, cheese consistency and structure as well as the use of additives, starters, etc.

Prerequisite: AGRT 271

**AGRT 329 BUSINESS KNOWLEDGE****3.0: 3 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****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.

**AGRT 334 FOOD SYSTEMS****3.0: 3 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.

**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 AVIATION ENGLISH III****1.0: 1 cr. E**

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

**AVEN 241 AVIATION ENGLISH IV****1.0: 1 cr. E**

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

**AVEN 311 AVIATION ENGLISH V****1.0: 1 cr. E**

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

**AVEN 312 AVIATION ENGLISH 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 211 APPLIED BUSINESS MATHEMATICS****3.0: 3 cr. E/F**

This course focuses on the Study of unvaried and multivariate functions, differential equations and linear modeling Systems, matrix and diagonalization and dynamic systems.

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

This course represents the general principles of microeconomics. Topics include (1) elements of supply and demand, (2) consumer behavior, (3) production and costs, and (4) market structures (competition and monopoly).

**BUST 215 MANAGEMENT INFORMATION I****3.0: 3 cr. E/F**

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

**BUST 221 FINANCIAL ACCOUNTING 2****3.0: 3 cr. E/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 AND ETHICS****3.0: 3 cr. E/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. The ethical principles are also highlighted with all moral problems that could arise in a business environment.

### **BUST 223 ANALYTICAL ACCOUNTING**

**2.0: 2 cr. E/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/F**

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.

Prerequisite: BUST 211

### **BUST 226 MATHEMATICS OF FINANCE**

**3.0:3 cr. E/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.

Prerequisite: BUST 211

### **BUST 231 MACROECONOMICS**

**3.0:3 cr. E/F**

This course will teach students the basic tools of macroeconomics and apply them to real world economic policy. The goals of the course are for students to (1) understand how to evaluate macroeconomic conditions such as unemployment, inflation, and growth - what can be learnt from National Accounts (2) understand how monetary policy and fiscal policy can be used to influence short-run macroeconomic conditions. The course will be structured around the classical models of macroeconomics, using primarily graphs, and occasionally equations.

### **BUST 232 ADVANCED ACCOUNTING**

**3.0:3 cr. E/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. It covers the concept of groups with the development of consolidated financial statements, according to the principles of consolidation in accordance with the international countable standards (IAS/IFRS). Finally, this course makes it possible to the participants to take note of the international harmonization on the accounts of the companies, as implemented by the International Accounting Standards Board (IASB).

Prerequisite: BUST 221

### **BUST 233 BUSINESS LAW**

**3.0:3 cr. E/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, tenant and personal properties, goodwill, modes of structure of the company: single owner, companies and co-operatives, financing and sale, bankruptcy, insolvency and dissolution of the company.

**BUST 234 FINANCIAL ANALYSIS****3.0:3 cr. E/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.E/ 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 INTERNATIONAL STANDARDS IAS-IFRS****2.0: 2 cr. E/F**

This course covers the following topics: 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.

Prerequisite: BUST 232

**BUST 343 COMPANIES ACCOUNTING****2.0: 2 cr. E/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 221.

**BUST 344 FINANCIAL MANAGEMENT****3.0: 3 cr. E/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 226, 234.

**BUST 346 TAXATION AND VAT****2.0: 2 cr. E/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 349 RESEARCH METHODS****2.0: 2 cr. E/F**

In this course, the student will be able to select a research topic, conduct initial research to develop appropriate problem statements, research questions, and hypotheses so that an appropriate research method can be selected. The student will also be able to develop a literature review and a research methodology based on the selected topic. The course is structured around two main axes: (1) define the steps and methods of the scientific investigation; (2) identify steps involved in writing a thesis or in a research paper.

**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.

Pre-requisite: BUST 250.

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

This course provides an overview of procedures and recommendations which ensure the sustainability of the capital, the quality of information and the improvement of an organization's performance. Students will acquire all concepts, methodologies and tools needed for an internal audit so as to identify and evaluate managerial risks.

Prerequisite: BUST 223

**BUST 353 INTERNATIONAL TRADE****3.0: 3 cr. E/F**

This course provides a background in international economics, covering historical development of international trade theories from Mercantilisms, Adam Smith, and David Ricardo to today in an attempt to understand what macroeconomic and microeconomic effects trade has on an economy. The course is designed to serve this level and as a preparation for further study of both applied international economics and advanced international trade theory.

Prerequisite: BUST 213,231.

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

International Finance is an advanced course in economics. It surveys a variety of topics in international finance and open-economy macroeconomics, including: the national balance of payments, the foreign exchange market, exchange rate determination, Purchasing Power Parity, and the evolving International Monetary System. The course will also discuss various recent policy debates.

Prerequisite: BUST 213, BUST 231

**BUST 357 BUSINESS EVALUATION****3.0: 3 cr. E/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 PRINCIPLES OF E-COMMERCE****3.0: 3 cr. E/F**

This course deals with the basic concepts of E-Commerce, including events related to laws and regulations.

Prerequisite: BUST341

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

This course uses mathematic methods in addressing topics in economics. The pervasive underpinning of this course is managerial decision making in a business environment by using basic tools of Operations Research. Managerial decisions cover labor negotiation, litigation, pricing, and similar topics, with an emphasis on optimal choices and how to restructure situations to encourage optimal outcomes for all parties.

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

The course will provide students with a fundamental understanding of the financial system and explore the connection between financial markets, financial institutions and the economy. It also gives an introduction to risk management and behavioral finance principles to understand the functioning of securities, insurance, and banking industries.

The first part of the course is indented to define the role and functions of financial markets, the types of financial actors, the term structure of interest rates, stock market mechanisms, principals of derivatives, and currencies.

The second part gives an overall summary of financial institutions, in particular commercial banks, investment banks, insurance companies, mutual funds, the Federal Reserve Systems and their role in the economy.  
Prerequisite: BUST 213,231.

### **BUST 363 AUDIT**

**2.0: 2 cr.E/ 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 QUANTITATIVE TECHNIQUES APPLIED TO BUSINESS**

**2.0: 2 cr.E/ F**

This course presents the statistics (descriptive statistics, modeling and forecast) from a managerial point of view. It also deals with many problems encountered in companies and proposes concrete presentations of complex approaches. The chapters consider issued problems and outcomes. This course familiarizes students to work on models and to analyze the correlation between a set of variables (quantitative and qualitative). This course requires a theoretical and practical methodology based on the use of EXCEL and SPSS (Statistical Package for the Social Science).

Prerequisite: BUST 224

### **BUST 367 STRATEGIC MANAGEMENT**

**3.0: 3 cr. E/ F**

This course allows students to identify and describe the strategies that managers can carry on so as to achieve better performance and competitive advantages for an organization. It will treat the following concepts: Strategy, definitions and features, strategic management process, environmental scanning, strategy formulation, strategy evaluation, strategic decisions, strategic leadership, corporate governance and core competencies.

Prerequisite: BUST 222

### **BUST 368 FINANCIAL ENGINEERING**

**3.0: 3 cr.E/ F**

This course allows students to understand the main derivatives products traded on financial markets (futures, forward contracts, options and swaps), as well as their use for hedging, speculation and arbitrage. Furthermore, students will get practical knowledge on the mechanics of organized markets and will learn how to price a derivative through forward price calculation, premium calculation, P&L calculation and NPV calculation.

### **CIVT 211 STATICS**

**3.0: 3 cr.E/ 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.E/ 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.E/ 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.E/ 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.E/ 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.E/ 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.

Prerequisite: CIVT 211.

Co-requisite: ME CT 211.

**CIVT 224 TECHNICAL DRAWING****1.0: cr.E/ 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 225 GEOLOGY****2.0: 2 cr.E/ F**

The course provides an introduction to the main geological processes and a broad appreciation of geohazards and geotechnical risks, of the formation and variability of geotechnical materials, and the importance of groundwater. Fundamental soil and rock properties are introduced in the context of basic soil mechanics.

**CIVT 233 THEORY OF STRUCTURES I****3.0: 3 cr.E/ 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****1.0: 1 cr.E/ F**

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

**CIVT 241 HVAC PRINCIPLES AND EQUIPMENT****3.0: 3 cr.E/ 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.

Pre-requisite: MECT 211.

**CIVT 242 TOPOGRAHY AND SURVEYING****2.0: 2 cr.E/ 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 211.

**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.

Prerequisite: CIVT 233.

**CIVT 245 GEOTECHNICAL ENGINEERING LAB****0.3:1 cr.F**

Geotechnical analysis and design using commercial software PLAXIS including design of foundations and lateral earth retaining systems. Results, visualizations and assessment.

Co-requisite: CIVT 233.

**CIVT 246 STRENGTH OF MATERIALS LABORATORY****1 cr. E/F**

Concrete constituents and mix design; time of setting of cement; mixing and testing fresh concrete; determination of density of hardened concrete; compressive strength of concrete cubes and cylinders; flexural tensile strength of concrete; splitting tensile strength of cylindrical concrete specimens; determination of static modulus of elasticity in compression; tensile strength of steel bars; Marshall stability and flow of bituminous mixtures.

Prerequisite: CIVT221, CIVT 312. Corequisite: CIVT 244.

**CIVTT 250 TRAINING 1****4 cr.**

The students should do a training in an institution whereby they get exposed and engaged in activities related to their field of studies. At the end of the training the students should deliver a report and a presentation that describe their work during the training period.

**CIVT 311 FOUNDATION DESIGN****3.0: 3 cr. E/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.E/ 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.

Pre-requisite: CIVT 221.

**CIVT 313 TRANSPORTATION ENGINEERING****3.0: 3 cr.E/ 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.

Co-requisite or Prerequisite: CIVT 242.

**CIVT 314 CONSTRUCTION MANAGEMENT****3.0: 3 cr.E/ 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.

Pre-requisites: CIVT 224, 244.

**CIVT 315 BUILDING LAW****3.0: 3 cr.E/ F**

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

Prerequisite: CIVT 224.

**CIVT 316 ENGINEERING ECONOMY****3.0: 3 cr.E/ 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.

Prerequisite: MECT 211.



**CIVT 317 CONSTRUCTION MANAGEMENT LAB****0.3: 1 cr.E/ F**

Use of commercial software for the operations, planning, budgeting, scheduling, resource allocation, resource leveling, and controlling construction projects.

Co-requisite: CIVT 314

**CIVT 318 TRANSPORTATION ENGINEERING LAB****0.3: 1 cr.E/ F**

Highway design using professional commercial softwares integrating planning, geometric design including horizontal and vertical curves design, cross-sections with cut and fill calculations, and traffic modeling including traffic lights design and level of service.

Co-requisite: CIVT 313.

**CIVT 321 REINFORCED CONCRETE II****3.0: 3 cr. E/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. E/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: MECT 325.

**CIVT 326 STRUCTURAL ANALYSIS LAB****0.3: 1 cr. E/F**

This course uses computer-based methods for the analysis of large-scale structural systems. Topics covered include: modeling strategies for complex structures: application to tall buildings, cable-stayed bridges, and tension structures.

Co-requisite: CIVT 321.

**CIVT327 INTRODUCTION TO ENVIRONMENTAL ENGINEERING****3.0: 3 cr.E/ F**

Knowledge of environmental elements; mass and energy transfer and balances; environmental chemistry; mathematics of growth and decay; risk assessment and management; surface water pollutants, biological and chemical oxygen demands, eutrophication; water supply systems and drinking water standards; wastewater treatment systems and effluent standards; groundwater flow, contaminant transport, and remediation technologies; hazardous waste and pollution prevention; air pollution sources, control and atmospheric stability; ambient air quality standards, indoor air quality; global temperature, greenhouse effect and warming potential; global energy balance, carbon emission, and stratospheric ozone depletion; solid waste management, landfill disposal; medical waste; green building; and environmental law, ethics, and justice. Field trips are integrated into the classes.

**COMP 211 COMPUTER TECHNIQUES I****0.3: 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****0.3: 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.

**ENGT 101 BASIC ENGLISH 1** **2.0: 2 cr. E**  
This course is a basic introductory course. It aims at focusing on the student's ability to read, write and speak using English as the language of communication. The course provides students with the language skills necessary for university course work through communicative and interactive activities.

**ENGT 102 BASIC ENGLISH 2** **2.0: 2 cr. E**  
This course aims at focusing on the student's ability to read, write and speak using English as the language of communication. It provides students with the language skills necessary for university course work through communicative and interactive activities.

**ENGT 103 GENERAL ENGLISH 1** **3.0: 3 cr. E**  
This course focuses on reading comprehension, writing essays, and speaking and listening. Emphasis is placed on clear articulation and essay writing.

**ENGT 104 GENERAL ENGLISH 2** **3.0: 3 cr. E**  
This course focuses on training students to communicate and write. Emphasis is placed on the comprehension and analysis of oral and writing texts.

**ENGT 202 GENERAL ENGLISH 3** **3.0: 3 cr. E**  
This is a writing course that focuses on teaching the various writing strategies and forms.

**ENGT 203 GENERAL ENGLISH 4** **3.0: 3 cr. E**  
This course focuses on teaching the students how to write a research paper. It also requires that the students present their findings (PowerPoint presentation) and cite their references properly.

**ENGT 204 GENERAL ENGLISH 5** **3.0: 3 cr. E**  
This course is a literary course that focuses on research and analysis of literary texts. It requires writing a research paper based on the topics discussed in class.

**FRET 201 CULTURE & COMMUNICATION 1** **2.0:2 cr. F**  
Ce cours permettra aux étudiants d'acquérir les bases des techniques de communication écrite/orale dans un contexte professionnel, d'organiser leur pensée et de s'exprimer oralement afin d'améliorer leur élocution. L'enseignant insistera sur la connaissance de la langue française afin que l'étudiant soit capable d'écrire et de parler correctement. L'emploi de supports variés (articles de presse, vidéos, audios etc.) favorisera l'acquisition d'une culture générale. Le cours évaluera quatre compétences : compréhension et expression orales, compréhension et expression écrites selon le niveau des étudiants.

**FRET 202 CULTURE & COMMUNICATION 2** **2.0:2 cr. F**  
L'objectif de ce cours est de familiariser les étudiants avec les outils informatiques tel que le diaporama (PowerPoint, Prezi) nécessaire à l'élaboration d'un exposé, d'une synthèse etc. Ils apprendront également à rechercher des informations professionnelles, travailleront à l'élaboration de leur projet personnel et professionnel grâce à la mise en place d'un bureau virtuel ou d'un Espace Numérique de Travail (ENT). L'enseignant travaillera avec eux la soutenance orale. Les quatre compétences sont toujours visées.  
Prerequisite: FRET201

**FRET 203 CULTURE & COMMUNICATION 3** **2.0:2 cr. F**  
L'objectif de ce cours est d'apprendre aux étudiants le vocabulaire lié au monde de l'entreprise afin d'en expliquer son fonctionnement et son organisation. Ils apprendront également à rédiger un compte-rendu, à prendre des notes, à élaborer un exposé technique. Le cours s'appuiera sur différents types de supports comme des documentaires sur le monde du travail.  
Prerequisite: FRET202

**FRET 204 CULTURE & COMMUNICATION 4****3.0:3 cr. F**

Ce cours aura pour but de préparer les étudiants au stage de fin d'année. Ils devront être capable de rédiger un CV, une lettre de motivation, de préparer un entretien d'embauche en sachant argumenter leurs réponses, d'utiliser le téléphone, d'envoyer un mail professionnel, etc. Ils apprendront à rédiger un rapport de stage et à connaître la méthodologie d'une recherche scientifique pour rédiger leur mémoire de 3ème année.

Prerequisite: FRET203

**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 2****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.

Prerequisite: INFT215.

**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 250 TRAINING 1****4 cr.**

The students should do a training in an institution whereby they get exposed and engaged in activities related to their field of studies. At the end of the training the students should deliver a report and a presentation that describe their work during the training period.

**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****3.0: 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.

**INFT 350 TRAINING 2****4 cr.**

The students should do a training in an institution whereby they get exposed and engaged in activities related to their field of studies.

**LISP 200 LIBRARY USE AND RESEARCH METHODS****1 cr. E/F**

This course teaches the fundamentals of library use and research techniques, in addition, it focuses on the uses of the different library resources and their use. This course is free of charge.  
Corequisite: ENGT202 or Prerequisite: FREN203.

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

This course covers techniques of integration for definite and their applications. The course then gives an overview of first and second order linear differential equations and their solution sets. The course finally presents Laplace transform, Fourier Series and their applications.

**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**

Linear Systems. Matrix Operations. Echelon Form. Vector Spaces. Linear Transformation. Determinants. Eigenvalues and Eigenvectors.

**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**

The course covers the following topics: random variable, probability distribution (discrete, continuous, joint), cumulative distribution, mathematical expectation, Estimation and Test of Hypotheses.

**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: Atomics structures of materials, materials classification, crystal imperfections, Electrical and mechanical properties of metal, composite materials and corrosion.

### **MECT236 STATICS**

**2.0: 2cr. E/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.

### **MECT 241 CALCULUS II**

**2.0: 2 cr. E/F**

The course covers the following topics: multivariable functions, Lagrange Multipliers, Multiple integrals: double and triple (Cartesian, polar, spherical and cylindrical coordinates). Green and Stokes Theorem.

Prerequisite: 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  $\mu\text{C}$ . MCC-1Q chopper: Theoretical study and simulation. Experimental study of the chopper controlled by  $\mu\text{C}$ . 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 INDUSTRIAL ROBOTS**

**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.

Prerequisite: MECT 221.

### **MECT 312 DIGITAL SIGNAL PROCESSING**

**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.

Pre-requisite: TELT 231.

### **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**

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

### **MECT 316 MECHANICS OF MATERIALS**

**2.0:2 cr. E/F**

Fundamental stress and strain relationships, axial stress, safety factors, statically indeterminate axially loaded members, torsion, bending and shear stresses in beams, transformation of stress and strain, combined stresses, deflections in beams, and analysis of columns.

Prerequisite: MECT211,236,246.

### **MECT 317 CAD DESIGN 2**

**1.0:1 cr. E/F**

Architectural drawings of residential/commercial/ industrial buildings meeting local specifications. electrical and mechanical views, sectioning, hatching and assembling of mechanical machines and equipment.

Prerequisite: MECT245

### **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 223.

### **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**

**3.0: 3 cr. E/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.

**MECT 326 FUNDAMENTALS OF MANAGEMENT AND ECONOMICS**

**2.0: 2 cr. E/F**

This course is organized to contain two major parts: Functions of engineering management, and Economic fundamentals for engineering managers. Part one introduces the basic functions on engineering management such as planning, organizing, leading and controlling, while part two covers the fundamentals of engineering economics.

**MECT 327 FUZZY LOGIC CONTROL**

**2.0: 2 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.

Prerequisite: MECT 223.

**MECT 328 ELECTRICAL INSTALLATIONS**

**1.0:1 cr. E/F**

Electric wires and cables; wiring systems and techniques; residential and industrial wiring in conformance with the current National Electrical Code and local codes; circuit protection devices; circuits for electric lamps; metering of current, voltage, power and energy.

Prerequisite: MECT 223.

**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 MICROCONTROLLERS**

**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 INTRODUCTION TO NETWORKS**

**2.0: 2 cr. E/F**

This course introduces Data Networking: benefits, topologies, Devices, Communication Protocols and Communication models.

### **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 SCALING NETWORKS**

**2.0: 2 cr. E/F**

Dynamic Routing Protocols are explained in details: EIGRP, Single and Multi-Area OSPF and their respective configurations.

Prerequisite: 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 CONNECTING NETWORKS**

**2.0: 2 cr. E/F**

This course gives and explains the different scenarios and methods to connect a branch to the Internet and to connect different branches between them including DSL, Frame Relay, ATM, ...etc.

Prerequisite: TELT 224

**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.

**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 databses, their characteristics, functions, etc. Topics include data modeling, database design theory, data defitnition 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 350 LABOR LAW****1.0: 1 cr. E/F**

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

**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.