

● برنامج هندسة الألكترونيات الطبية.

1- المواد المطلوب إنجازها:-

University requirements courses are unified for all the programs of Modern University for Technology & Information. They consist of 13 credits of total 160 credits), which are satisfied by completing seven (7) courses:

- 1- Four (4) compulsory courses equivalent to 7 credits (4.375 %), as listed in table 22- a.
- 2- Three (3) elective courses equivalent to 6 credits (3.75 %), as listed in table 22- b.

Table 22.a: Compulsory Courses of University Requirements: (7 credit Hours of total 160 credits).

Code	Subject	Credit Hours	Contact hours				Prerequisites
			L	T	L/P	TT	
HUM 011	Technical English	1	1	-	-	1	NONE
HUM 021	History of Engineering and Technology	2	2	-	-	2	
HUM 141	Presentation Skills	2	2	-	-	2	
HUM X41	Critical Thinking	2	2	-	-	2	
Total		7	7	-	-	7	

Table 22.b: Elective Courses of University Requirements: (6 Credits Hours of total 160 credits)

Code	Subject	Credit Hours	Contact hours				Prerequisites
			L	T	L/P	TT	
Pool of UR Elective (1) Courses (HUM 3E* (2CH))							
HUM 331	Professional Ethics and Legislation	2	2	-	-	2	NONE
HUM 332	Human Rights	2	2	-	-	2	
HUM 333	Architecture and planning laws and regulations	2	2	-	-	2	
Pool of UR Elective (2) Courses (HUM 3E* (2CH))							
HUM 351	Issues of Energy, Water and Climate Change	2	2	-	-	2	NONE
HUM 352	Nuclear Safeguards	2	2	-	-	2	
HUM 353	Sustainability Topics in Architecture/ Urbanism	2	2	-	-	2	
Pool of UR Elective (3) Courses (HUM 4E* (2CH))							
HUM 461	First Aid Skills	2	2	-	-	2	NONE
HUM 462	Engineering Psychology	2	2	-	-	2	
HUM 463	Building Safety and Fire Protection	2	2	-	-	2	
Total		6	6	-	-	6	

To achieve these Intended Learning Outcomes, a set of courses must be completed as a Faculty Requirements. Faculty Requirements (Mathematics, Mechanics, Physics, Engineering Sciences and Engineering Culture Courses) consist of 34 credits of total 160 credits which are satisfied by completing Twelve (12) courses:

- 1- Eleven (11) compulsory courses equivalent to 31 credits as listed in table 23. a.
- 2- One (1) elective course equivalent to 3 credits as listed in table 23. b.
- 3- The student must pass the field training-I and-II to satisfy the graduation requirements.

Table 23.a: Compulsory Courses of Faculty Requirements: (31 credits of total 160 credits)

Code	Subject	Credit Hours	Contact hours				Prerequisites
			L	T	L/P	TT	
EMP 011	Mathematics-I	3	2	2	-	4	NONE
EMP 012	Mathematics-II	3	2	2	-	4	EMP 011
EMP 021	Mechanics-I	3	2	2	-	4	NONE
EMP 022	Mechanics-II	3	2	2	-	4	EMP 021
EMP 031	Physics-I	3	2	1	2	5	NONE
EMP 032	Physics-II	3	2	1	2	5	EMP 031
EMP 041	Chemistry	3	2	1	2	5	NONE
EMP 051	Engineering Graphics	3	1	-	5	6	NONE
ELE 061	Introduction to Computers	2	1	-	3	4	NONE
MEC 061	Principles of Manufacturing Engineering	3	1	-	5	6	NONE
TRN X11	Technical Report Writing	2	2	-	-	2	HUM 011
TRN 221	Field Training-I	-	-	-	-	-	NONE
TRN 321	Field Training-II	-	-	-	-	-	NONE
Total		31	19	11	19	49	

Table 23.b: Elective Courses of Faculty Requirements: (3 Credits Hours of total 160 credits).

Code	Subject	Credit Hours	Contact hours				Prerequisites
			L	T	L/P	TT	
Pool of FR Elective Courses (BUS XE* (3CH))							
BUS X11	Engineering Economy	3	2	2	-	4	NONE
BUS X12	Project Feasibility Studies	3	2	2	-	4	
BUS X21	Accounting	3	2	2	-	4	
BUS X31	Introduction to Finance	3	2	2	-	4	
Total		3	2	2	-	4	

To achieve these Intended Learning Outcomes, a set of courses must be completed as a Discipline Electrical Engineering Requirement which consist of (65) credits of total 160 credits, which are satisfied by completing Twenty-Three (23) courses as listed in table 24.

Table 24: Compulsory Courses of Discipline Requirements: Electrical Engineering (65 Credits of total 160 Credits)

Code	Subject	Credits	Contact hours				Prerequisites
			L	T	L/P	TT	
ELE 111	Electrical Circuits-I	3	2	1	2	5	EMP 032
ELE 112	Electrical Circuits-II	3	2	1	2	5	ELE 111
ELE 113	Electronic Circuits-I	3	2	1	2	5	EMP 131
ELE 121	Logic Design-I	3	2	1	2	5	NONE
ELE 141	Electrical Measurements and Instrumentation	2	1	-	3	4	ELE 111
ELE 151	Data Structures	3	2	1	2	5	ELE 161
ELE 161	Computer Programming	3	2	-	3	5	ELE 061
ELE 211	Electronic Circuits-II	3	2	1	2	5	ELE 113
ELE 221	Microprocessor	3	2	1	2	5	ELE 121
ELE 222	Logic Design-II	3	2	1	2	5	ELE 121
ELE 223	Computer Organization	2	1	-	3	4	ELE 161
ELE 224	Embedded Systems	3	2	-	2	4	ELE 221
ELE 231	Electrical Machines-I	3	2	1	2	5	ELE 112
ELE 241	Signal Analysis	3	2	1	2	5	EMP 114
ELE 242	Electromagnetic Fields	2	2	-	1	3	EMP 032+ EMP 216
ELE 271	Automatic Control Systems	3	2	1	2	5	EMP 114
ELE 341	Digital Signal Processing	3	2	1	2	5	ELE 241
ELE 371	Digital Control Systems	3	2	1	2	5	ELE 271
EMP 113	Probability and Statistics	3	2	2	-	4	EMP 012
EMP 114	Differential Equations	3	2	2	-	4	EMP 012
EMP 131	Modern Physics	2	2	1	1	4	EMP 032
EMP 216	Multivariable Calculus and Special functions	3	2	2	-	4	EMP 114
EMP 217	Numerical Analysis	2	2	1	-	3	EMP 113
TOTAL		65	44	21	39	104	

☐ **Major Requirements**

The Requirements of Bio-Electronics Engineering Track consist of 48 credits of total 160 credits, which are satisfied by completing Eighteen – (18) courses:

1. Thirteen (13) Compulsory Applied Engineering courses equivalent to 33 credits as listed in table 25.a.
2. Five (5) elective applied engineering courses equivalent to 15 credits as listed in table 25. b.

Table 25. a: Compulsory Courses of Major Requirements: Bioelectronics Engineering Track (33 Credits of total 160 Credits)

Code	Subject	Credits	Contact hours				Prerequisites
			L	T	L/P	TT	
ELE 346	Biosensors and Signals	3	2	1	2	5	ELE 241
ELE 381	Biomaterials	2	2	1	-	3	ELE 391
ELE 391	Biology	3	2	1	2	5	NONE
ELE 392	Anatomy and Physiology	3	2	1	2	5	NONE
ELE 393	Biomedical Devices	3	2	1	2	5	ELE 346
ELE 401	Graduation Project-I	1	1	-	1	2	115 CH
ELE 402	Graduation Project-II	3	1	-	6	7	ELE 401
ELE 449	Medical Image Processing	3	2	1	2	5	ELE 341
ELE 491	Medical Imaging	2	2	1	-	3	ELE 449
ELE 492	Medical Lab Instrumentation	3	2	1	2	5	EMP 041+ ELE 141
MEC 312	Thermodynamics and Heat Transfer	3	2	1	2	5	EMP 031
MEC 323	Bio-Fluid Mechanics	2	2	-	1	3	EMP 031
MEC 456	Biomechanics	3	2	2	-	4	EMP 022 + ELE 381
TOTAL		33	24	11	22	57	

Table 25. b: Elective Courses of Major Requirements: Bioelectronics Engineering Track (15 Credits of total 160 Credits)

Code	Subject	Credits	Contact hours				Prerequisites
			L	T	L/P	TT	
Pool of Bioelectronics Engineering Elective Courses (ELE 3E* (3 CH))							
ELE 382	Computer Aided Diagnostics in Biomedical engineering	3	2	-	3	5	ELE 161
ELE 383	Clinical Engineering	3	2	-	3	5	NONE
ELE 394	Tissue Engineering	3	2	-	3	5	NONE
ELE 395	Biochemistry for Engineers	3	2	-	3	5	NONE
Pool of Bioelectronics Engineering Elective Courses (ELE 4E* (12 CH))							
ELE 426	Biomedical System Modeling and Simulation	3	2	-	3	5	EMP 113
ELE 454	Computer Vision	3	2	-	3	5	ELE 161
ELE 481	Bio Informatics	3	2	-	3	5	ELE 391
ELE 482	Computational Methods in Medicine	3	2	-	3	5	ELE 161
ELE 483	Medical Space Planning	3	2	-	2	4	NONE
ELE 484	Total Quality Management in Health Care	3	2	-	2	4	EMP 113

ELE 493	Tissue Implants	3	2	-	2	4	ELE 381
ELE 494	Medical Equipment	3	2	-	3	5	ELE 346
ELE 495	Sterilization Techniques	3	2	-	2	4	EMP 041
ELE 496	Rehabilitation Equipment	3	2	-	2	4	MEC 456
ELE 497	Magnetic Resonance Imaging and Nuclear Medicine	3	2	-	2	4	EMP 032
TOTAL		15	10	-	13	23	