- برنامج هندسة التحكم.

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 a total of 160 credits), which are satisfied by completing seven (7) courses:

1- Four (4) compulsory courses equivalent to 7 credits as listed in table 26- a.
2- Three (3) elective courses equivalent to 6 credits as listed in table 26- b.

Table 26.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 26.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 27. a.
2- One (1) elective course equivalent to 3 credits as listed in table 27. b.
3- The student must pass the field training-I and-II to satisfy the graduation requirements.

Table 27.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 27.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 28.

Table 28: 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 Control 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 29.a.
2. Five (5) elective applied engineering courses equivalent to 15 credits as listed in table 29. b.

Table 29. a: Compulsory Courses of Major Requirements: Control Engineering Track (33 ***Credits of total 160 Credits)***

Code	Subject	Credits	Contact hours				Prerequisites
			L	T	L/P	TT	
ELE 313	Power Electronics	3	2	1	2	5	ELE 113
ELE 332	Electrical Machines-II	3	2	1	2	5	ELE 231
ELE 333	Electrical Power Transmission and Distribution	2	2	1	-	3	ELE 242
ELE 372	Applied Automatic Control	3	2	1	2	5	ELE 271
ELE 373	Modern Control Systems	3	2	1	2	5	ELE 372
ELE 374	System Dynamics and Control	3	2	1	2	5	ELE 271
ELE 375	Hybrid Control Systems	2	2	-	1	3	ELE 271
ELE 407	Graduation Project-I	1	1	-	1	2	115 CH
ELE 408	Graduation Project -II	3	1	-	5	6	ELE 407
ELE 431	Control of Electrical Machines	3	2	1	2	5	ELE 332
ELE 471	Process Control	3	2	2	-	4	ELE 373
ELE 472	Motion Control	2	2	-	1	3	ELE 373
ELE 473	Computer Control Systems	3	2	1	2	5	NONE
TOTAL		**33**	**24**	**10**	**22**	**56**	

Table 29. b: Elective Courses of Major Requirements: **Control** ***Engineering Track (15 Credits, of total 160 Credits)***

Code	Subject	Credits	Contact hours				Prerequisites
			L	T	L/P	TT	
Pool of Control Engineering Elective Courses (ELE 3E* (3 CH))							
ELE 314	Electronic Circuit Design	3	2	-	3	5	ELE 211
ELE 334	Power System Analysis	3	2	-	3	5	ELE 333
ELE 376	Principles of optimal control	3	2	-	3	5	EMP 216
Pool of Control Engineering Elective Courses (ELE 4E* (12 CH))							
ELE 425	Computer Interfacing	3	2	-	3	5	ELE 223
ELE 428	Computer Modeling and Simulation	3	2	-	3	5	NONE
ELE 432	Electromechanical Motion Devices	3	2	-	3	5	ELE 332
ELE 452	Computational Intelligence	3	2	1	2	5	EMP 113+ ELE 161
ELE 456	Software Design Patterns	3	2	-	3	5	ELE 223
ELE 474	Robotic Systems and control	3	2	-	3	5	ELE 271

ELE 475	Industrial Automation	3	2	-	2	4	ELE 373
ELE 476	Introduction to Nonlinear Control Theory	3	2	-	2	4	EMP 114
ELE 477	Control of Industrial System	3	2	-	2	4	NONE
ELE 478	Operation and control of Power Systems	3	2	-	3	5	ELE 313
TOTAL		**15**	**10**	**-**	**14**	**24**	