Communication and Computers Engineering Program (CCE)

Regulation 2013

Program Curriculum & Study plan & Course Syllabi

1. **Program Curriculum**

Course Code	Course Name	Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE.[1]	Subject Area (Credit Hours)		
			Math & Basic Sciences	Engineering Topics Check if Contains Significant Design (√)	Other
MATH 001	Calculus 1	R	√		
PHYS 011	Physics-1	R	√		
MATH 002	Engineering Mechanics 1	R	√		
ENG 031	Engineering Fundamentals 1	R		√	
CHEM 021	Chemistry	R	√		
ENG 032	Engineering Fundamentals 2	R		√	
CSE 051	Computer Programming	R		√	
MATH 003	Calculus 2	R	√		
MATH 005	Engineering Mechanics 2	R	√		
PHYS 013	Physics-2	R	√		
UNC 041	English-1	R			√
UNC 042	English-2	R			√
CSE 156	Computer Architecture	R		√	
CSE 162	Digital Design	R		√	
ECE171	Solid State Electronics	R		√	
MATH 106	Differential Equations	R	√		
MATH 107	Multi-Variable Calculus	R	√		
CSE 155	Computer Engineering	R		√	
UNC143	Technical English Writing	R			√
UNC142	Finance	R			√
UNC144	Decision Support System	R			√
ENG 111	Introduction to Civil Engineering	R		√	
CSE 153	Introduction to Data Structures and Software Engineering	R		√	
ECE 172	Electronics 1	R		√	
ECE 161	Electric Circuit Analysis	R		√	
501	Lab Training	R		√	
CSE 265	Databases	R		√	
MATH 209	Probability and Statistics	R	√		
ECE264	Electromagnetic Fields	R		√	
Math 208	Discrete Mathematics	R	√		
CSE 257	Operating System	R		√	

Code	Title	Type			
ENG 234	Fundamentals Thermo-Fluids	R		√	
UNC 245	Management Information Systems	R			√
ECE 275	Signals and Systems	R		√	
ECE 274	Electronics 2	R		√	
ECE 277	Introduction to Communication System	R		√	
ENG 233	Engineering Economy	R			√
CSE 276	Control System	R		√	
ECE 378	Analog and Digital Communications	R		√	
CSE 358	Computer Graphics	R		√	
UNC 345	Operation Research	R			√
ENG 368	Electrical Energy Systems	R		√	
CSE 357	Internet Programming	R		√	
CSE 359	Microprocessor System	R		√	
ECE 379	Digital Signal Processing	R		√	
UNC 344	Law for Management	R			√
UNC 346	Marketing	R			√
CSE 301	Software Engineering	SE		√	
CSE 302	Computer & Network Security fundamentals	SE		√	
CSE 303	Foundations of Information's	SE		√	
CSE 304	Distributed Systems	SE		√	
ECE 301	Electronics of Communications	SE		√	
ECE 302	Mobile Communication System	SE		√	
ECE 303	Electromagnetic Waves	SE		√	
ECE 304	Optoelectronics	SE		√	
502	Field Training 22	R		√	
UNC446	Quantitative Methods of Quality Control	R			√
UNC 447	Communication Skills	R			√
UNC448	Projects Management	R			√
498	Project and Report 1	R		√	
499	Project and Report 2	R		√	
CSE 401	Human- Computer Interaction	SE		√	
CSE 402	Web Based Information System	SE		√	
CSE 403	Language Processors	SE		√	
CSE 404	Multimedia	SE		√	
CSE 405	Parallel Algorithms	SE		√	
CSE 406	Embedded and Real Time System	SE		√	
CSE 407	Decision Algorithms	SE		√	
CSE 408	Selected Topics in Computer and information	SE		√	

ECE 401	**Integrated Circuit Design**	SE		√	
ECE 402	**RF Circuits and Devices**	SE		√	
ECE 403	**Microwave Engineering**	SE		√	
ECE 404	**Antennas**	SE		√	
ECE 405	**Communication Networks**	SE		√	
ECE 406	**Telecommunication Systems**	SE		√	
ECE 407	**Digital Image Processing**	SE		√	
ECE 408	**Selected Topics in Electronics and Communications**	SE		√	
	TOTALS (in terms of semester credit hours)		35 Hours	117 Hours	28 Hours
	Total must satisfy minumum credit hours	Minimum Semester Credit Hours	30 Hours	45 ours	

2. **Study plan**

▪ **Freshman Year-Fall Semester:**

Code	Course Name	Teaching Hours				Wr. Exam Dur.	Marking				Subject Area						
		Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
MATH 001	Calculus- 1	2	3	0	3	2	50	0	50	100		3					
PHYS 011	Physics-1	2	2	2	4	2	40	10	50	100		4					
MATH 002	Engineering Mechanics-1	3	3	0	3	2	50	0	50	100		3					
ENG 031	Engineering Fundamentals -1	2	3	0	3	2	50	0	50	100					3		
CHEM 021	Chemistry	2	2	2	4	2	40	10	50	100		4					
UNC 041	English	2	0	0	2	2	50	0	50	100	2						
Total		13	13	4	19	12	280	20	300	600	2	14	0	0	3	0	0

▪ **Freshman-Spring Semester:**

Code	Course Name	Teaching Hours				Wr. Exam Dur.	Marking				Subject Area						
		Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
MATH 003	Calculus- 2	2	3	0	3	2	50	0	50	100		3					
PHYS 013	Physics-2	2	2	2	4	2	40	10	50	100		4					
MATH 005	Engineering Mechanics-2	2	3	0	3	2	50	0	50	100		3					
CSE 051	computer programming	2	3	0	3	2	50	0	50	100			3				
ENG032	Engineering Fundamentals -2	2	0	3	3	2	40	10	50	100					3		
UNC 042	English-2	1	0	3	2	2	40	10	50	100	2						
Total		13	13	4	19	12	280	20	300	600	2	14	0	0	3	0	0

▪ **Sophomore -Fall Semester:**

Code	Course Name	Teaching Hours				Wr. Exam Dur.	Marking				Subject Area						
		Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
ECE161	Electric Circuit Analysis	2	3	0	3	2	50	0	50	100			3				
MATH106	Differential Equations	2	3	0	3	2	50	0	50	100		3					
CSE 153	Introduction to Data Structures and Software Engineering	2	0	3	3	2	40	10	50	100			3				
ECE171	Solid State Electronics	2	3	0	3	2	50	0	50	100			3				
CSE 162	Digital Design 1	3	0	3	4	2	40	10	50	100			4				
UNC142	Finance	2	0	0	2	2	50	0	50	100						2	
UNC143	Technical English Writing	2	0	0	2	2	50	0	50	100	2						
Total		15	9	6	20	12	280	20	300	600	2	3	13	0	2	0	0

- **Sophomore -Spring Semester:**

Code	Course Name	Teaching Hours				Wr. Exam Dur.	Marking				Subject Area						
		Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
CSE155	Introduction To Computer Engineering	2	3	0	3	2	50	0	50	100			3				
ECE172	Electronics 1	3	0	3	4	2	40	10	50	100			4				
ENG 111	Introduction to Civil Engineering	3	0	0	3	2	50	0	50	100			3				
MATH 209	Probability and Statistics	2	3	0	3	2	50	0	50	100		3					
MATH 107	Multivariable Calculus	2	0	0	2	2	50	0	50	100		2					
UNC144	Decision Support Systems	3	0	0	3	2	50	0	50	100	3						
Total		15	7	3	18	12	290	10	300	600	3	5	10	0	0	0	0

- **Junior-Fall Semester:**

Code	Course Name	Teaching Hours	W	Marking	Subject Area

Code	Course Name	Lectures	Exercises	Practical	Total Hours	Wr. Exam Dur.	Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
ENG234	Fundamentals of Thermo-fluids	2	3	0	3	2	50	0	50	100			3				
ECE264	Electromagnetic Fields	2	3	0	3	2	50	0	50	100			3				
ECE 275	Signal and Systems	2	3	0	3	2	50	0	50	100			3				
MATH208	Discrete Mathematics	2	3	0	3	2	50	0	50	100		3					
CSE 156	Computer Architecture	2	3	0	3	2	50	0	50	100			3				
UNC245	Management Information System	2	3	0	3	2	50	0	50	100	3						
Total		12	18	0	18	12	300	0	300	600	3	3	12	0	0	0	0

▪ Junior-Spring Semester:

Code	Course Name	Teaching Hours				Wr. Exam Dur.	Marking				Subject Area						
		Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
CSE 276	Control Systems	2	0	3	3	2	40	10	50	100			3				
ECE274	Electronics-2	3	0	3	4	2	40	10	50	100			4				
CSE 256	Databases	2	0	3	3	2	40	10	50	100			3				
ECE277	Introduction to Communication System	2	3	0	3	2	50	0	50	100			3				
ENG233	Engineering Economy	2	0	0	2	2	50	0	50	100			2				
CSE 257	Operating Systems	2	0	3	3	2	40	10	50	100				3			
	Practical Training				1											1	
Total		13	3	12	18	12	260	40	300	600	0	0	15	3	2	1	0

▪ Senior 1-Fall Semester:

Code	Course Name	Teaching Hours	W	Marking	Subject Area

Code	Course Name	Lectures	Exercises	Practical	Total Hours	Wr. Exam Dur.	Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
CSE358	Computer Graphics	3	0	3	4	2	40	10	50	100				4			
ENG368	Electrical Energy Systems	2	0	3	3	2	40	10	50	100			3				
ECE378	Analog and Digital Communications	2	0	3	3	2	40	10	50	100				3			
	Technical Elective 1	2	3	0	3	2	50	0	50	100				3			
UNC344	Law for Management	2	0	0	2	2	50	0	50	100							2
ENG 345	Operation Research	2	3	0	3	2	50	0	5	100	2						
Total		**13**	**6**	**9**	**18**	**12**	**270**	**30**	**300**	**600**	**2**	**0**	**3**	**10**	**0**	**0**	**2**

- **Senior 1-Spring Semester:**

Code	Course Name	Teaching Hours				Wr. Exam Dur.	Marking				Subject Area						
		Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
ECE 359	Microprocessor System Design	2	0	3	3	2	40	10	50	100				3			
ECE379	Digital Signal Processing	2	0	3	3	2	40	10	50	100				3			
CSE357	Internet Programming	2	0	3	3	2	40	10	50	100				3			
	Elective course 2	2	3	0	3	2	50	0	50	100				3			
	Capstone Design Elective 1	2	0	3	3	2	40	10	50	100				3			
UNC346	Marketing	2	0	0	2	2	50	0	50	100							2
	Field Training				2									2			
Total		**12**	**3**	**12**	**17**	**12**	**260**	**40**	**300**	**600**	**0**	**0**	**0**	**17**	**0**	**0**	**2**

- **Senior 2-Fall Semester:**

Code	Course Name	Teaching Hours	W	Marking	Subject Area

Code	Course Name	Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
	Elective course 3	2	3	0	3	2	50	0	50	100				3			
	Elective course 4	2	3	0	3	2	50	0	50	100				3			
	Elective Design course	2	0	3	3	2	40	10	50	100				3			
498	Project and Report 1	2	0	6	4	2	50	0	50	100						4	
UNC 446	Quantitative Methods For Quality Control	2	3	0	3	2	50	0	50	100	3						
Total		10	9	9	16	10	240	10	250	500	3	0	0	9	0	4	0

- ### Senior 2-Spring Semester:

Code	Course Name	Teaching Hours				Wr. Exam Dur.	Marking				Subject Area						
		Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
	Elective course 5	2	3	0	3	2	50	0	50	100				3			
	Elective course 6	2	0	3	3	2	40	10	50	100				3			
499	Project and Report 2	2	0	6	4	2	50	0	50	100						4	
UNC 447	Professional &Communication Skills	2	0	0	2	2	50	0	50	100	2						
UNC 448	Project Management	3	0	0	3	2	50	0	50	100							3
Total		11	3	9	15	10	240	10	250	500	2	0	0	6	0	4	3

- ### Total teaching hours and subjects distribution over the subject areas:

Semester	Teaching Hours	W	Marking	Subject Area

	Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Engineering Culture	Proj. & Practice	Business Administrator
Freshman 1st semester	13	13	4	19	12	280	20	300	600	2	14	0	0	3	0	0
Freshman / 2nd semester	13	13	4	19	12	280	20	300	600	2	14	0	0	3	0	0
Sophomore/1st semester	15	9	6	20	12	280	20	300	600	2	3	13	0	2	0	0
Sophomore / 2nd semester	15	7	3	18	12	290	10	300	600	3	5	10	0	0	0	0
Junior/1st semester	12	18	0	18	12	300	0	300	600	3	3	12	0	0	0	0
Junior / 2nd semester	13	3	12	18	12	260	40	300	600	0	0	15	3	0	1	0
Senior 1/1st semester	13	6	9	18	12	270	30	300	600	2	0	3	10	0	0	2
Senior 1- 2nd semester	12	3	12	17	12	260	40	300	600	0	0	0	17	0	0	2
Senior 2/1st semester	10	9	9	16	10	240	10	250	500	3	0	0	9	0	4	0
Senior 2/ 2nd semester	11	3	9	15	10	240	10	250	500	2	0	0	6	0	4	3
Total of Five Years	127	84	68	179	116	2700	200	2900	5800	19	39	53	45	8	9	7
% of Five Years										10.55	21.6	29.44	25	4.44	5	3.8
% NARS										8-12	18-22	25-30	25-30	4-6	4-6	2-4

3. Course Syllabi

2 Cr	English language (1)	UNC041

Prerequistes---- :

Technology in use (listening)-Live in maintenance (reading)-Technical writing (paragraph)-Materials Technology (listening)-Industrial process monitoring (reading)-Technical writing (Essay)-Technical writing (report)-Technical writing (structure and types)

2 Cr	English language (2)	UNC042

Prerequistes---- : UNR041

Analysis and interpretation of engineering issues – summarizing engineering issues – preparation for language tests

3 Cr	Calculus 1	UNC042

Prerequistes---- : MATH 01

Transcendental Functions-Derivatives-Applications of Differentiation-Polynomial Functions-Partial Fractions-System of Linear Algebraic Equations-Partial Derivatives

3 Cr	Calculus 2	MATH 003

Prerequistes---- : MATH 01

Techniques of integration –Integration by reduction –Definite integral ad its properties
Improper integral –Applications of integration (area, volume, and arc length)-First order ordinary differential equations-Infinite series-Quadratic equation of two variables
Conic sections –Parametric equation of conic sections-Coordinate systems in space-line and plane in space –Quadratic surfaces (cylinder, sphere, ellipsoid, hyperboloid, cone and paraboloid).

3 Cr	Engineering Mechanics 1	MATH 002

Prerequistes---- :

Force Vectors – 3 Dimensions – Equilibrium of particles in 3 Dimensions
Force System resultants –Equilibrium of Rigid Body in three dimensions –Centroids and Centers of gravity –Analysis of simple structures, Frames, and Machines.

3 Cr	Engineering Mechanics 2	MATH 005

Prerequistes---- : MATH 002

Distributed loads and Fluid statics –Simple Trusses, Method of Joints and Method of Sections
Dry Friction and its application, Frictional forces on Screws and Wedges –Kinematics of a particle
and General curvilinear motion –Curvilinear motion in different coordinates

3 Cr	Physics (1)	PHYS 011
Prerequistes---- :		

Units and dimensional analysis –Mechanical properties of metal Experiment: Determine the Young's modulus of materials. – Oscillations. Experiments: 1– Determine the gravity of acceleration by using the simple pendulum. 2– Determine the spring constant and the verification of Hook's law.
The Wave and superposition principle –The Sound waves and Doppler effect Experiments: 1– Determine the speed of sound by using open air column and tuning forks. Temperature and thermometers. – Quantity of heat Experiments: Determine the melting point of wax. –Thermal expansion –Heat transfer The first law of thermodynamics –The entropy and the second law of thermodynamics.

3 Cr	Physics (2)	PHYS 013
Prerequistes---- : PHYS 011		

The Charge and the electric field – Coulomb's law – The electric flux and Gauss's law The electric potential – The capacitors and dielectrics The magnetic field –Boit– Savart's law – The magnetic flux Gauss's Law – Faraday's Law– Magnetic Induction. – Nature of light – Experiment: Determine the refractive index of the prism's material – Interference of light – Diffraction – Polarization –Experiment: Verification of Malus' law. – Early quantum theory – Special Relativity

3 Cr	Principles of Engineering Chemistry	CHEM 021
Prerequistes---- :		

Equation of state. – Lab: Acid Base Titration – Chemical thermodynamics. – Lab: Oxidation Reduction Titration – Material and heat balance in fuel combustion and chemical processes. – Properties of solutions –Lab: Precipitation Titration (Chlorides) – Electrochemistry Introduction to corrosion engineering – Industries of Dyas & Chemistry of cement &fertilizer–Dynamic Equilibrium in Physical and Chemical Processes

3 Cr	Computer Programming	CSE 051
Prerequistes---- :		

Problem solving techniques for engineering problems in the field of electrical, electronics and omputer Engineering. – Procedural programming concepts. – Object oriented programming, inheritance, overriding, and overloading. –Compiling, linking, and debugging using C++ and Java programming

languages. – Case study 1: building a complete database application. – Case study 2: building a complete Network application using ports and sockets.

3 Cr	Engineering Fundamental 1	ENG 031
Prerequistes---- :		
History of Engineering – Engineering Fields of Specialization and Curricula.– The Engineering Profession: Professionalism, Problem Presentation and Solution, Ethics, Licensing.– Introduction to Drafting and Descriptive Geometry.– Basic Geometric Operations. – 2-D Sketching, Dimensioning – Isometric Pictorials. – Software application.		

3 Cr	Engineering Fundamental 2	ENG 032
Prerequistes---- : ENG 031		
Introductory to Drafting and Descriptive Geometry – Free-hand Sketching & Lettering– Geometric Constructions – Orthographic Projection– Pictorial Projection –Missing Views and Sectional Views – Software Application		

Level 100

3 Cr	Summer Training – 1	501
Prerequistes---- :		
Safety implications of electrical equipments – Use of electronic measuring devices – Network basics and programming – Arduino systems and projects		

3 Cr	Introduction to Data Structures and Software Engineering	CSE 153
Prerequistes---- : CSE 051		
Introduction to Data Structure and algorithm – Develop facility in thinking about abstract data types. Analyze the efficiency of algorithms – Abstract Data Types – Array one , two dimention (Declareation – dealing) example – Linked List (usage – declaration – example – Functions – types) –Stack (Usage – declaration – implementation Functions –) example – Tree ((Usage – declaration – implementation – Functions –)example –Search Algorithm (linear – Binary) Sorting (Bubble – quick – merge ---) –Evaluation and analysis of studied algorithms using a recent programming		

3 Cr	Computer Engineering	CSE 155
Prerequistes---- : CSE 051		

An Introduction to the design and operation of digital computers- Information Representation Logic Design- Integrated Circuits- Register Transfer Description – Basic Computer Organization – Machine-Level Programming – An Introduction to the design and operation of digital computers

3 Cr	Digital Design	CSE 162
Prerequistes---- : CSE 155		

Numbering System and operations – Decimal Coding systems – Boolean Algebra Logic gates and implementations – Karnof map – Main Terms – combinational circuits design Adders, Sub-tractors, Decoder, encoder and multiplexer implementations

3 Cr	Electrical Circuit Analysis	ECE 161
Prerequistes---- : MATH 003		

Elements of electrical circuits – Simple resistive circuits – Analysis of DC circuits – Theories of electrical circuits – First-order circuits – steady AC sinusoidal circuits- Power and power factor Resonance circuits – Three-phase circuits

3 Cr	Solid State Electronics	ECE 171
Prerequistes---- : PHY 013		

Crystal Structures – Bonding and Imperfections in crystals Schrodinger Equation – Allowed and Forbidden Energy band-gaps Krong Penny Model – EK diagram- Materials and Density of States- Intrinsic and Extrinsic Semiconductors- Extrinsic Carrier Concentration- PN Junctions – Virtual Labs on Crystals, band structure and PN junction

3 Cr	Introduction to Civil Engineering	ENG 111
Prerequistes---- :		

General classes of materials.- Testing, inspection, specifications of different types of materials.
Mechanical Behaviors of metals, static tensions, static compression. – Building stones. – Mineral aggregates classifications.- Surveying – earth shape.- Types of surveying. Loads and reactions.- Internal forces. – Applications.

3 Cr	Electronic1	ECE 172
Prerequistes---- : ECE 171		

Revisions on , N type, P type semiconductors and PN junctions-Rectifier Diodes, Half, Full-Wave Rectifiers and Rectifier Filters- Diode limiting, clamping circuits and voltage multiplier Zener Diodes, and Their Applications- Optical Diodes and simulation for diode circuit applications- Bipolar Junction Transistors,

Fundamentals- Bipolar Junction Transistors, Biasing circuits- Junction Field Effect Transistors, Fundamentals and Biasing circuits- MOSFET Field Effect Transistors, Fundamentals and Biasing circuits

3 Cr	Differential Equations	MATH 106
Prerequistes---- ： MATH003		
Applications of partial differentiation. -Maximum values of functions in more than one variable and applications- First order differential equations- Second order differential equations Laplace transform and its applications- Analytical geometry in space		

3 Cr	Multivariable Calculus	MATH 106
Prerequistes---- ： MATH 001 , MATH 003		
Fourier series -Fourier transform- Complex numbers- Functions of a complex variable- Complex integration- Residue theorem- Direction derivatives- Double integrals- Triple integrals- Line integrals- Surface integrals		

3 Cr	Probability and Statistics	MATH 209
Prerequistes---- ： MATH 001 , MATH 003		
Measures of tendency and dispersion.- Probability distributions Sampling theorem- Tests of hypothesis- Non-parametric tests- Regression and correlation - Time series.		

2 Cr	Finance Systems	UNC142
Prerequistes---- ：		
Natural theory of cost-profit maximization- Capital investment.- Market structure. Production relations- Decision making.- Add economic project analysis and student presentations to practice for effective communication with listeners		

2 Cr	Technical English Reports	UNC 143
Prerequistes---- ：		
Technical writing definition- audience analysis- Technical writing styles- Technical document characteristics Automated document organization- official and unofficial document types- Structure of different types of technical documents.		

2 Cr	Decision Support Systems	UNC 144
Prerequistes---- ：		
An overview of Decision support system (DSS).- An overview of Visual Basic.- The creation of a decision support system using automation. - Integrate Visual Basic with Microsoft Office object models.- Intermediate & advanced		

Visual Basic topics include ActiveX Documents, ActiveX Controls, ActiveX components, Active Server Pages.– Scientific research techniques and the ability to analyze and solve problems	

level 200

CSE 257	Operating Systems
Prerequistes	CSE 155, CSE 156
Introduction to the operating system, background, and basics – Operating system history, and design issues File systems – Study of different data access methods –System resources management – Managing and scheduling tasks (CPU scheduling) –Memory hierarchy –Memory types – Different memory implementations – Memory management techniques Secondary storage management – Cache memory implementation –Implement simple cache memory using a programming language–Sequential execution – System selection consideration–Study of recent operating systems – Process synchronization–Threads–Interrupts Deadlock detection methods– Deadlock prevention and system recovery methods–Virtual memory concepts, paging, segmentation and address mapping–Secondary storage management, disk components, disk scheduling, and swap–space management–UNIX process control and management.	

CSE 265	Data Base
Prerequistes	CSE 153 , CSE 156
Basic database concepts –Data structures and operations –Data modeling–Database system architecture –Data definition and data manipulation languages –query languages including Algebra and SQL –software package training	

CSE 156	Computer Architecture
Prerequistes	CSE 155
Computer arithmetic – design of ALU Pipelined ALU and processor – multiprocessors – multicomputers control unit –Instruction repertoires (RISC, CISC) – interrupt circuits Bus synchronization – I/O devices – channels – memory architectures Connection of computer peripherals – Distributed Systems scalable computer platforms –vector processors – vectorizing compilers systolic arrays – loosely and tightly coupled processors symmetric and CC–NUMA multiprocessors– data flow machines interconnectin networks–clustering – parallel processors architecture parallel programming performance evaluation – case studies	

CSE 276	Control Systems
Prerequistes	ECE 275

Introduction to control systems – Open and closed loop control systems –Laplace transformation and transfer function –Block diagram reduction –Signal flow graph –Modeling of systems: (Electrical circuits, Mechanical systems, DC motors) –Modeling of systems: (AC servo motors, Synchro, Potentiometers, stepper motors – Hydraulicservo motor – Thermal systems – liquid level systems)–Linearization of nonlinear mathematical model – Time response analysis: (First order systems –steady state error)–Time response analysis: (second order systems) – Stability of control systems: (Routh stability analysis)–Stability of control systems: (Determining relative stability using Routh and root locus method)–Applications of the previous topics using MATLAB/Simulink toolboxes.

ECE 264	Electromagnetic fields
Prerequistes	BAS 113 , ECE 121

Vector analysis and Coordinate systems–electrostatic charges –Gauss Theorem–Laplace operator, Boundary conditions, PEC –Capacitors analysis using Q, V methods and simulation tools–moving charges and current carrying wires–Magnetic Field, Intensity, Flux and Coils–Faradat's, Lenz –Modified Ampere's Law and Maxwell's equations

ECE 274	Electronic 2
Prerequistes	ECE 172

SCR, Triac, special diode –BJT/FET non-idealities –Small signal analysis –Single stage amplifier–Multiple stage amplifier –differential amplifier, OPAMPs, and linear digital ICs

ECE 275	Signals and Systems
Prerequistes	ECE 161, MATH 106

Introduction to signals–Linear time-invariant systems –Laplace Transform and Continuous–time signals–Z–Transform and discrete–time signals–Spectral analysis and Fourier Transform

ECE 277	Introduction to Communications Systems
Prerequistes	ECE 275

Introduction to communication systems-Power spectral density-Amplitude modulation (suppressed and large carrier)-Frequency modulation-Wide band FM-AM and FM receivers.-Noise in analog modulation systems.-An introduction to the structure and types of mobile comm. systems – the seven-layer communication model – network planning and design – and its applications.

ENG 233	۱ Engineering Economy
Prerequistes	MATH 208

Introduction to engineering economy studies, balance sheet, income statement, cash flow statement-Time value of money with simple interest rate-Time value of money with compound interest rate-Economical evaluation and feasibility study of engineering projects-Payback period – Net present value concepts and applications-Equivalent annual – Net future value concepts and applications-Benefit – cost ratio concepts and applications-Inflation effects and applications of engineering projects-History of Engineering, Science and Technology, the role of engineering and technology in the development and emergence of civilizations, and analysis of economic projects (Gap analysis)

ENG 234	Thermodynamics
Prerequistes	Phy011

Introduction of thermodynamics concepts and definitions-Continuity, momentum and energy equations-Pure substance and ideal gases-Laminar and turbulent flows-First law of thermodynamics in closed systems-Laminar and turbulent flows-First law of thermodynamics in open systems-Flow in conduits-Second law of thermodynamics-Gas cycles-Turbo machinery-Heat transfer basics

MATH 208	Discrete Mathematics
Prerequistes	MATH 107

Introduction to logic and proof –Mathematical induction-Counting technique-Algorithms-Relations-Graphs and trees

level 300

CSE 301	Software Engineering
Prerequistes	CSE 051–CSE 153

An introduction to basic concepts of software engineering-Software development process (Waterfall models, Agile methods, Rapid application development)-System modeling using UML-Data flow diagram design, System architecting and design-Process Model: practical: implement a client server database model-Testing, validation, verification: practical: implement a client server model-Quality Assurance& Configuration Management-Software project management-Implement and design applications using recent design tools

CSE 302	Computers Fundamental and Network Security
Prerequistes	

Introduction to computer Networks-Computer network and topology-Computer network and model-Security principles and security threats-Protocols for Security Services-Elements of cryptography-Advanced security issues and technologies-Network programming

CSE 303	Foundmental of Information Systems
Prerequistes	CSE 155, UNC 245

Introduction to Information Systems, dimensions of information systems-Global E-Business today-Data and Knowledge, Management information systems-Database, knowledge base Architecture-Information system approaches and complementary assets-Functional and cross functional Business processes, TPS and BI-Enterprise systems and social/electronic business-Supporting information systems-Organizational politics and structures -Social and political issues of information systems

CSE 304	Distributed Systems
Prerequistes	

An introduction to distributed systems-System models (physical and architectural models)-Networking and internetworking-Network virtualization and communication -Peer-to-peer systems and web services-Cloud and grid computing -Design and implement Real distributed system projects

CSE 357	Internet Programming
Prerequistes	CSE 051, CSE 153

Client server programming models-Protocols – server design and constructions such as; fault tolerance, caching, proxying, and security-Web service-Programming network applications-Web based applications-Implementing database applications on the web-Introduction to Embedded programming and multi-threaded programming

CSE 358	Computer Drawing
Prerequistes	CSE 276

The principles of computer drawing, computer graphics, and introduction to computer graphics with programming language-Graphics algorithms and applications-Computer graphics with Java Applet-2D drawing methods and functions (Line, rectangle, circle, polygon, images) (Resolution – Brightness – Intensity)-Image formats, color systems (Gray, RGB, ….)-Animation, event handler-3D drawing methods and functions-Experimental projects with Java programming language and appropriate tools.

UNC 143	Microprocessors
Prerequistes	CSE 213 CSE 155

Introduction to microprocessor system-Architecture of microprocessor and registers-Hardware connections, buffers and latches-Clocking and timing issues-Addressing modes-Memory management and interface circuit design-Input/output management and interface circuit design-PPI architecture and design examples.-Microprocessor projects design applications-Introduction to Assembly language programing

ECE 302	Mobile Communications
Prerequistes	ECE 378

Conventional telephone systems-Traffic theory-Conventional mobile system – Frequency spectral efficiency-Methods of increasing system capacity – System architecture-Multiple access schemes – Interference in cellular

systems-Hand off – Fading and Doppler in cellular system -GSM system architecture – GSM channel coding-Ciphering and modulation-System management.

ECE 278	Analog & Digital Communications
Prerequistes	ECE 277 & MATH 209
Introduction to modern digital communication systems-Waveform Coding Systems -Base Band PCM transmission and probability of error -Information Theory, Coding, and Channel Capacity-Channel Coding for Error Detection and Correction-Digital Modulation/Demodulation-Spread Spectrum Communications-Seven-layer communication model and network planning, design and layers	

ECE 379	Digital Signal Processing
Prerequistes	ECE 275
Converting analog signals to digital signals-IIR digital filter design – FIR digital filter design-implementation of digital filters-Wiener filter – adaptive filters-data compression and encryption-Applications on digital signals.	

ECE 301	Communication Electronics
Prerequistes	ECE 274
Passive network synthesis-Active network design-Data acquisition systems-Data converters-Logic families-Phase locked loops.-Communication circuits.	

ECE 303	Electromagnetic Waves
Prerequistes	ECE 264

Time varying fields and Maxwell's equations, boundary conditions at different media interface, retarded potentials, plane wave propagation in free space-TEM transmission lines, transmission line equivalent circuit-transmission line circuit theory, Smith chart, lossy transmission lines, matching techniques-Parallel palate waveguides-Circular waveguides

ECE 304	Optoelectronics
Prerequistes	ECE 264

Introduction, Photons & Electrons. Maxwell's equations, Wave nature light, Emission of and Absorption processes.-Fundamentals of Optics, Ray optics: reflection, refraction, critical and Brewster angles. Interference of light, Interferometers, Diffraction and Polarization-Light and matter: Emission, Propagation and Absorption Processes-Optical Coherence and Correlation: Definition, Measurement of coherence and Practical examples-Essential Physics of Radiation and Solids: Black body radiation, Classical results and Quantum results. Rate Equations and the Gain mechanism. Laser Structure, Mode locking and Q switching.-Electrons in solids: Laser sources (He=Ne Laser, Argon Laser and ND-YAG Laser), SC sources (LEDs and SLDs)-Optical Modulators: Internal modulation, External modulators: Electro optic, Magneto optic and Acousto-optic modulator-Photo detectors: photo-emissive, photoconductive and photovoltaic detectors-Testing of the basic characteristics of optical sources, detectors, and optical components.-Assignments Presentation and discussions.

ENG 368	Electrical Power Systems
Prerequistes	ECE 161, ECE 264

Electrical power systems-three phase systems-Theory and models of transformers-Transmission line models-Voltage and frequency control, effective and ineffective power-Optimal work of power systems-The theory of operation – The construction of the Direct Current motors-The speed .torque .and current characteristics – applications of the DC motors-The theory of operation and construction of stepper motors – Permanent-magnet DC motor and Low-inertia DC Motors-The theory of operation .construction of three phase induction motors.

	Field Training (2)
Prerequistes	

Embedded systems –Computer engineering basics –Communication measurements–Mobile communication devices troubleshooting –Computer engineering managements –Field practical training –Reports, and projects outputs

UNR 281	Law and Human Rights
Prerequistes	
Systems and laws of institutions–Introduction to Accounting–Labor legislation and laws governing engineering professions–Industrial security legislation and environment–Historical philosophical origins of human rights–international sources of human rights–national sources of human rights–global bodies based on the protection of human rights	

UNC 345	Operational Research
Prerequistes	UNC 245
Introduction and history of Operations Research–Overview of Operations Research Modeling Approach–Introduction to Linear Programming–Graphical method –Simplex method–Transportation problem–Assignment problem–Integer programming–Network Analysis–Program Evaluation and Review Technique and Critical Path Method (PERT and CPM)	

UNC 346	Marketing	
Prerequistes		
Principles of products marketing–Marketing research–Customers buying behavior–Marketing mix–Plotting marketing strategy–Building marketing plan–Pinpointing the target market–Marketing on the world wide web		

4 Cr	Project and Report (1)	498
Prerequistes---- ؛		
Completion of a project using all previously learned sciences from different fields in order to solve a realistic problem in a team. The project ends with a technical report and a discussion.		

4 Cr	Project and Report (2)	499
Prerequistes---- ؛ 498		
Completion of a project using all previously learned sciences from different fields in order to solve a realistic problem in a team. The project ends with a technical report and a discussion.		

3 Cr	Human Computer Interaction	CSE 401
Prerequistes---- ؛ 498		
Interfacing and Map of Human Computer Interaction –Interfacing with python programming, data types, operators, numbers, decision making. –Python collections (lists, set, tuple, dictionary), loops –Interfacing with files (text and excel files) Functions, different types of function arguments – Object oriented programming (OOP) concepts with python –GUI programming with Tkinter		

3 Cr	Web based information Systems	CSE 402
Prerequistes---- ؛ CSE 056		
Introduction to client programming– Illustrating HTTP protocol–Discussing major technologies used in building Web servers. –Explaining components of Windows–based IIS Server.– Implementing Windows–based IIS Server using ASP. NET along with C#–Explaining components of Apache Server.–Implementing Apache Server using PHP–SQL database servers–XML programming.		

3 Cr	Language Processors	CSE 403
Prerequistes---- ؛		
Introduction to the theory of languages –Evolution of computer languages and translators formal specification of languages –context dependent and context free languages logical structure of a compiler –lexical, syntax and semantic analysis code generation and optimization –storage and register allocation – runtime considerations		

3 Cr	Multimedia	CSE 404
Prerequistes---- :		
An introduction to multimedia –Multimedia presentation, Data compression, Data production Graphics and image data representation –Color in Image and Video –Multimedia data compression (Lossless, Lossy compression techniques, and Basic Video Compression Techniques) –Design and implement multimedia projects		

3 Cr	Parallel Algorithms	CSE 405
Prerequistes---- :		
Parallel languages: general principles, parallel constructs, vectorizing compilers, issues – portability. Practical exposure to parallel programming –Parallel algorithms: general principles, recurrences, parallel approach to data structures and computational structures Future trends: technology, design limitations, future supercomputers. –Parallel algorithm implementations –Origins of parallelism, classification of algorithm designs, characterization of performance		

3 Cr	Decision Ananlysis	CSE 406
Prerequistes---- :		
Introduction to A.I. – Common application for A.I. –Importance of knowledge, knowledge representation –Reasoning methods and dealing with uncertainty –Search concepts –Rule based expert systems –Expert systems dealing with uncertainty –Prolog tutorial and A.I. programming concepts		

3 Cr	Embedded Systems	CSE 407
Prerequistes---- :		
An introduction to embedded systems –Embedded computing platform principles– Microcomputer systems –PIC18F Microcontroller Series –C programming Language Functions and Libraries in mikroC –System analysis and architecture design –Simple Projects with C Programming Language		

3 Cr	Internet Engineering	CSE 408
Prerequistes---- :		
An introduction to major protocols used in internet engineering –Discussing Internetworking protocols IP, ICMP –Discussing Transport layer protocols TCP, UDP –New technologies introduced on the internet, such as IP Multicast, Mobile IP, IPv6, VPNs, and quality of service– routing on the Internet –network security and firewall design –An overview of the application protocols such as SMTP, HTTP, RTP, and SNMP –Advanced Topics in Computer Engineering		

3 Cr	Integrated Circuits	ECE 401

Prerequistes---- : ECE 274

IC technology – Tuned amplifiers – Noise analysis –Operational amplifiers and applications – Waveform generation – Analog IC applications (analysis and design) –Evaluation of circuit performance by computer-aided circuit simulations –Phase locked loops – Electronic circuits in radio and television –Video recording

3 Cr	High Frequency Circuits	ECE 401

Prerequistes---- :

Wiener filters, linear prediction –steepest-descent and stochastic gradient algorithms – frequency-domain adaptive filters – method of least squares, recursive least squares, fast fixed order and order-recursive (lattice) filters –Mis adjustment, convergence and tracking analyses, stability issues, finite precision effects –connections with Kalman filtering and nonlinear adaptive filters

3 Cr	Microwave Engineering	ECE 403

Prerequistes---- :

Rectangular and circular wave guides –Cavity resonators –Excitation of waveguides –Surface guiding and dielectric optical waveguides –Analysis of microstrip and strip lines –Scattering parameters –Wave propagation in ferrite media and passive microwave components

3 Cr	Antennas	ECE404

Prerequistes---- : ECE 264

Maxwell's equations, and field analysis –Antenna parameters –Fundamental antennas – Antenna arrays –Introduction to wave propagation –Ground waves and Space waves –Antenna Array Synthesis

3 Cr	Computer Networks	ECE405

Prerequistes---- : ECE 277

Introduction To Computer Networks –Experimental: NIC and UTP cable, installing.
Introduction to Data Communication –Experimental: PCs on a Network –Network Components (HW- SW) - Network Architecture –Computer Network Classification and types –Network Layered Model for communication and different communication protocols –Network Design techniques and modeling – 7 Layers Model (ISO-OSI) - Experimental: PCs on the Internet. Application Layer protocol –Experimental: Wireless Networks and Mobile Systems. Transmission Layer Protocol –Network layer Protocol – Study Different Routing Algorithms

Digital integrated network system –Experimental: interference between Bluetooth and 802.11b Routing –Ethernet and packet Decoding –Practical Study and Exercises –Experimental: Configure ICS and Trace the Operations of DHCP and NAT

3 Cr	Telecommunications Systems	ECE 406
Prerequistes---- :		

Discrete Fourier Transform and its properties – Fading (fast, slow, and flat) –Frequency – selective and non-selective –Dual Multi-Tone (DMT) – OFDM – Multi-path propagation – Delay spread values and Guard time and cyclic extension – OFDM parameters, OFDM versus single carrier modulation. – Spread Spectrum – PN sequence generators –Direct sequence Spread Spectrum – Probability of error – Frequency Hopping Spread Spectrum –CDMA –DS-CDMA

3 Cr	Digital Image Processing	CCE 461
Prerequistes---- : ECE 379		

Image Representation – Methods Of Image Processing –Enhancement – Data Compression – Reconstruction From Projection – Features Extraction – Image Analysis – Pattern Recognition – Computer Vision

3 Cr	Quantitative Methods For Quality Assurance	UNC 446
Prerequistes---- :		

General Introduction – TQM and principals – TQM tools and techniques – Fundamental of statistics – Control chart for Variables – Control chart for attributes – Sampling plan – Introduction to all of the following processes (plumbing, blacksmithing and carpentry) and its effect on the quality of product

3 Cr	Selected Topics in Communications Engineering	ECE 408
Prerequistes---- :		

Neural Networks and Biomedical engineering – Cellular telephony – personal satellite communications – Voice telephony. – internet telephony and video conferencing – Advanced topics in the fields of electronics and Communications

2 Cr	Communication Skills	UNC 447
Prerequistes---- :		

Communication skills – Presentation planning and preparation – Delivery skills such as eye contact, voice control, gestures, body language and appearance – Presenter's characteristics – Using visuals – Presentation structure – Elevator Pitch

3 Cr	Project Management	UNC 448
Prerequistes---- :		

General introduction – Engineering Projects types and participants – Bar chart planning and scheduling methods – CPM method for planning and scheduling methods – PDM method for planning and scheduling methods – Resource smoothing and leveling

CCE Program Tree

Internal Training → **External Training** → **External Training**

Freshman (Level 000) 37 CH	Sophomore (Level 100) 38 CH	Junior (Level 200) 36 CH	Senior 1 (Level 300) 35 CH	Senior 2 (Level 400) 31 CH

Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8	Semester 9	Semester 10
MATH 001	MATH 003	ECE 161	ECE 172	UNC 245	ECE 274	Elec. 1	ECE 379	Elec. 3	Elec. 5
PHYS 011	PHYS 013	MATH 106	MATH 107	ECE 275	CSE 276	CSE 358	Elec. 2	Elec. 4	Elec. 6
CHEM 021	CSE 051	ECE 171	ECE 264	ECE 277	ENG368	Caps. 1	Caps. 2	499
MATH 002	MATH 005	CSE 153	CSE 162	CSE 155	MATH 208	ENG 233	ECE 378	CSE 357	498	UNC 447
ENG 031	ENG 032	ENG 111	CSE 257	UNC344	UNC 446	UNC 448
UNC 041	UNC 042	UNC 142	CSE 156	CSE 265	UNC 345	UNC 346
		UNC143	UNC 144	MATH 209	ENG 234	CSE 359

Legend:

Code	: 2 Credit Hours	Code	: 3 Credit Hours	Code	: 4 Credit Hours	XX CH	: Level Credit Hours