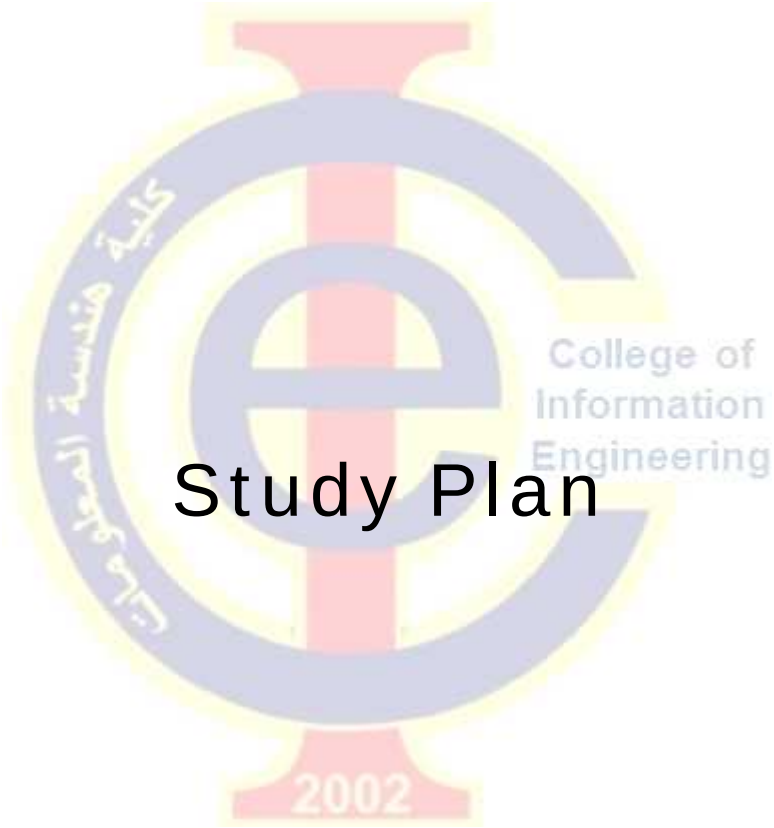
Information and Communication Engineering Program

Study Plan and Course Description

2015



Study Plan

Information & Communication Engineering						
First Year – Semester I						
No.	Code	Subject	Hrs. Per week			Units
			Theo.	App.	Tut.	
1	UR111	English Language I	2	-	-	2
2	CR111	Computer Programming	2	3	-	3
3	CR112	Mathematics I	3	-	1	3
4	CR113	Logic Circuits	2	3	-	3
5	CR114	IT Fundamentals &Workshop	2	3	-	3
6	CR115	Physical Electronics	3	3	-	4
Total			14	12	1	18
			27			

Information & Communication Engineering						
First Year – Semester II						
No.	Code	Subject	Hrs. Per week			Units
			Theo.	App.	Tut.	
1	UR121	English Language II	2	-	-	2
2	CR121	Object oriented Programming I (C++)	2	3	-	3
3	CR122	Mathematics II	4	-	1	4
4	CR123	Electrical Circuits	3	3	1	4
5	CR124	Engineering Drawing & CAD	1	2	-	2
6	ICE121	Internet Programming I	2	2	1	3
Total			14	10	3	18

Information & Communication Engineering						
Second Year – Semester I						
No.	**Code**	**Subject**	**Hrs. Per week**			**Units**
			Theo.	**App.**	**Tut.**	
1	UR211	Arabic Language	**2**	**-**	**-**	**2**
2	CR211	Object Oriented Programming II (Java)	**2**	**3**	**-**	**3**
3	CR212	Electronics	**3**	**3**	**-**	**4**
4	CR213	Engineering Analysis	**4**	**-**	**2**	**4**
5	ICE211	Statistical Inform. Theory	**2**	**-**	**1**	**2**
6	ICE212	Database Systems & Data Structure	**2**	**3**	**1**	**3**
Total			**15**	**9**	**4**	**18**
			28			

Information & Communication Engineering						
Second Year – Semester II						
No.	**Code**	**Subject**	**Hrs. Per week**			**Units**
			Theo.	**App.**	**Tut.**	
1	CR221	Digital Electronics	**2**	**3**	**-**	**3**
2	ICE221	Coding & Data Compression	**3**	**-**	**-**	**3**
3	ICE222	Microprocessors Architecture& Interfacing	**3**	**3**	**-**	**4**
4	ICE223	Internet Programming II	**2**	**2**	**-**	**3**
5	ICE224	Transmission Line Theory	**2**	**-**	**1**	**2**
6	ICE225	Computer Networks	**2**	**3**	**1**	**3**
Total			**14**	**11**	**2**	**18**
			27			

Information & Communication Engineering						
Third Year – Semester I						
No.	**Code**	**Subject**	**Hrs. Per week**			**Units**
			Theo.	**App.**	**Tut.**	
1	CR311	Communication Systems	**3**	**3**	**1**	**4**
2	CR312	Project Management	**2**	**-**	**1**	**2**
3	ICE311	Computer Architecture	**3**	**-**	**-**	**3**
4	ICE312	Modern Algebra & Discrete Mathematics	**2**	**-**	**2**	**2**
5	ICE313	Engineering Analysis(signal+numerical)	**3**	**3**	**1**	**4**
6	ICE314	Distributed Database	**2**	**2**	**-**	**3**
Total			**15**	**8**	**5**	**18**
			28			

Information & Communication Engineering						
Third Year – Semester II						
No.	**Code**	**Subject**	**Hrs. Per week**			**Units**
			Theo.	**App.**	**Tut.**	
1	UR321	Human Rights	**1**	**-**	**-**	**1**
2	CR321	Operating Systems	**3**	**2**	**1**	**4**
3	ICE322	Cryptography	**2**	**3**	**1**	**3**
4	ICE323	Digital Communications	**3**	**3**	**-**	**4**
5	ICE324	Image Processing	**2**	**3**	**1**	**3**
6	ICE325	Information Systems	**3**	**-**	**-**	**3**
Total			**14**	**11**	**3**	**18**
			28			

Information & Communication Engineering						
Fourth Year – Semester I						
No.	**Code**	**Subject**	**Hrs. Per week**			**Units**
			Theo.	**App.**	**Tut.**	
1	UR411	Democracy	**1**	**-**	**-**	**1**
2	CR411	Digital Signal Processing	**3**	**3**	**1**	**4**
3	ICE411	Project	**-**	**4**	**-**	**2**
4	ICE412	Wireless Communications	**2**	**3**	**0**	**3**
5	ICE413	Selected Subject-1	**3**	**2**	**-**	**4**
6	ICE414	Selected Subject-2	**3**	**2**	**-**	**4**
Total			**12**	**14**	**1**	**18**
			27			

Information & Communication Engineering						
Fourth Year – Semester II						
No.	**Code**	**Subject**	**Hrs. Per week**			**Units**
			Theo.	**App.**	**Tut.**	
1	ICE411	Project	**-**	**4**	**-**	**2**
2	ICE421	Multimedia Computing	**2**	**3**	**-**	**3**
3	ICE422	Internet Engineering	**2**	**2**	**1**	**3**
4	ICE423	Data Mining	**2**	**-**	**1**	**2**
5	ICE424	Selected Subject-3	**3**	**2**	**-**	**4**
6	ICE425	Selected Subject-4	**3**	**2**	**-**	**4**
Total			**12**	**13**	**2**	**18**
			27			

Hours and Units Summary

Information & Communication Engineering									
Sem.	**Year**	**Semester**	**Hrs. Per Week**			**Total Hrs**		**Total Units**	
			Theo.	**App.**	**Tut.**	**Per Week**	**Per Year**	**Per Semester**	**Per Year**
1	First	1st	14	12	1	27	810	18	36
2		2nd	14	10	3	27		18	
1	Second	1st	15	9	4	28	825	18	36
2		2nd	15	9	3	27		18	
1	Third	1st	15	8	5	28	840	18	36
2		2nd	14	11	3	28		18	
1	Fourth	1st	12	14	1	27	810	18	36
2		2nd	12	13	2	27		18	
Total (Four Years)						3285 Hours		144 Units	

	%Hrs	%Units
University Requirements	120/3300 = 3.65%	8/144= 5.5 %
College Requirements	1350/3285 = 41.1%	57/144 = 39.58 %
Department Requirements	1815/3285= 55.25%	79/144= 54.68 %

Elective Subjects

1- Information Security

2- Artificial Intelligence

3- Advanced Operating Systems

4- Network Management & Security

5- Network and Communication Protocols

6- Control Engineering

Course Description

First Year

Course Title	English I	Theoretical hours/w	2
Course Code	UR111	Practical hours/w	-
Year	First	Tutorial hours/w	-
Semester	First	Units	2

Course Description

Week No.	Topics
1	Introduction
2	The sentence : What is a sentence and what is not a sentence.
3	Parts of a sentence :subject ;types of subjects
4	Parts of a sentence :verb ;types of verbs :verb to be – ordinary verbs –modal verbs
5	types of verbs 2
6	Tenses: present v. past
7	The first exam
8	Parts of a sentence, the complement.
9	Types of a sentence ;simple sentence
10	Types of a sentence; complex sentence
11	Compound sentences
12	Practicing writing
13	The second exam
14	Practicing writing
15	Practicing writing
Textbook	Keith Boecker, P. Charles Brown, Oxford English for Computing, Oxford University press. Prentice Hall, Writing &Practice Communication in Action, Pearson, Prentice Hall.
References	Longmann Preparation Course of the TOEFL test .the paper test http://www.english for every one.com/

Course Title	Computer Programming	Theoretical hours/w	2
Course Code	CR111	Practical hours/w	3
Year	First	Tutorial hours/w	-
Semester	First	Units	3

Course Description

Week No.	Topics
1	Introduction to Computers and C++ Programming
2	Program Design: Algorithms, Pseudocode, Flowchart
3	Variable types, Boolean expression, arithmetic expression, reading & writing variables
4	Control statement :if statement & Switch statement
5	Repetition: For loop statement
6	Repetition: While … statement & Do … while statement
7	Functions
8	One Dimensional Array
9	Multidimensional Array
10	Array of Characters (String)
11	Vector
12	Pointers : Call by reference , addresses , types & array of pointes
13	Classes
14	Introduction to OOP
15	OOP structures
Textbook	Paul Deitel & Harvey Deitel, C++ How to Program, 8th edition, Pearson, 2012.
References	Lesley Anne Robertson, Computing concepts with C++ essentials, 5th Ed. 2007.

Course Title	Computer Programming lab	**Theoretical hours/w**	**2**
Course Code	CR111	**Practical hours/w**	**3**
Year	First	**Tutorial hours/w**	**0**
Semester	First	**Units**	**3**

Course Description

Week No.	Topics
1	Introduction to C++ language with its tools &writing simple programs with
2,3	If statement
4	Switch control
5,6	For loop
7	While &do while
8	One dimensional array
9	Array of characters (string)
10	Two dimensional array
11	Function: Writing header, Body, & Prototype
12	Function Call
13,14	Pointers : Call by reference , addresses , types & array of pointes
15	Introduction to OOP

Lecturer Name: **Signature:**	**Text books:** 1. Cay S. Horstmann, Computing Concepts with C++ Essentials, 3rd edition, John Wiley, 2003. 2. Lesley Anne Robertson, Computing concepts with C++ essentials, 5th Ed. 2007.

Course Title	Mathematics I	Theoretical hours/w	3
Course Code	CR112	Practical hours/w	-
Year	First	Tutorial hours/w	1
Semester	First	Units	3

Course Description

Week No.	Topics
1	**The Rate of Change of Function I:** Coordinates for the plane, Increments & distance, The slope of a straight line. Equations of a, straight line
2	**The Rate of Change of Function II:** Functions & graphs, Slopes of quadratic & cubic curves, The slope of the curves y=f(x), Derivatives, Velocity & other rates of change
3	**The Rate of Change of Function III:** Properties of limits, Infinity as a limit, Continuous functions.
4	**Derivatives I:** Formal differentiation. Polynomial functions & their derivatives. Products, power, & quotients.
5	**Derivatives II**: Implicit differentiation & fractional powers. Tangent line approximation. The chain rule & parametric equations. A brief review of trigonometry. Angles between curves.
6	**Derivatives III:** Derivatives of trigonometric functions. Newton's method for approximating solutions of equations. Inverse functions & the Picard method.
7	**Applications of Derivatives I:** Curves sketching. The sign of the first derivatives. Concavity & points. Asymptotes & symmetry. Maxima & minima. Theory. Maxima & minima. Problems
8	**Applications of Derivatives II:** Related rates. Rolle's theorem. The mean value theorem. Indeterminate forms & l'Hopital rules. Extending the Mean Value Theorem to Taylor's formula
9	**Integration I:** Indefinite integrals. Applications. Determining constants of integration. Integrals of trigonometric functions.
10	**Integration II:** Definite integrals. The area under a curve. Calculating areas as limits. The fundamental theorems of integral calculus.
11	**Integration III:** Integration by substitution Differentials. Rules for approximating definite integrals.
12	**Applications of Definite Integrals I:** Area between two curves. Distance. Calculating volumes by slicing.
13	**Applications of Definite Integrals II:** Length of plane curve. Area of a surface of revolution. Average value of a function.
14	**Transcendental Functions I:** The inverse trigonometric functions. Derivatives of the inverse trigonometric functions. The natural logarithm & its derivatives.
15	**Transcendental Functions II:** Properties of natural logarithm. The exponential function e^x. The function a^x & a^u. The function $y=\log_q u$
Textbook	**Text Book:** Thomas & Finney , Calculus & Analytic Geometry **Edition & year public:** Pearson Education Inc,11th Ed 2008
References	

Course Title	Logic Circuits	**Theoretical**	2
Course Code	CR113	**Practical hours/w**	3
Year	First	**Tutorial hours/w**	-
Semester	First	**Units**	3

Course Description

Week No.	Topics
1	Digital systems: Decimal, binary, octal, hexadecimal number, number
2	Boolean algebra and logic gate:
3	Basic definitions, axiomatic definitions of Boolean algebra, Boolean
4	Canonical and standard forms, Digital logic gate.
5	Simplification of Boolean functions:
6	Algebra manipulation, the map method, two, three, four, and five
7	Product of sum simplification, NAND implementation, NOR
8	Representation of signed numbers, r's complement, (r-1)'s complement.
9	2's complement adder-subtractor, binary codes, code conversion,
10	Design of digital devices: Decoder , BCD-to seven segment decoder.
11	Encoder, priority encoder.
12	Multiplexer: design of (1-4) multiplexer, design of (1-8) multiplexer.
13	DeMultiplexer: design of (1-4) demultiplexer, and (1-8) Demultiplexer.
14	Memory circuits: RAM, ROM, PROM, EPROM, and EEPROM.
15	Programmable logic circuit: PLA, PAL, FPLA, and PAL.
Textbook	Digital Design, M. Morris Mano & D. Michael, Prentice-Hall, 4th Edition,
References	Digital Fundamentals, Thomas L. Floyd, Prentice-Hall, 9th Edition, 2006.

Course Title	IT Fundamentals & Workshop	Theoretical hours/w	2
Course Code	CR114	Practical hours/w	3
Year	First	Tutorial hours/w	0
Semester	First	Units	3

Course Description - Theoretical

Week No.	Topics
1	**Computers:** Which computers are being used, How they are all different., Mainframes, Minis, PCs, Notebooks and Laptops, Tablets, PDAs and Pocket PCs, Cellular phones (GSMs), Other computing devices
2	**Networks** What a network is, What are the different types of networks, Their benefits, How to connect to them and use them.
3	**Parts of a Personal Computer** System Units and the parts inside, Motherboards, Microprocessor Chips, Power Supplies, Expansion Slots and Cards
4	**Understanding Memory** What memory does in a computer, How its size is measured , The difference between RAM and ROM, What is cache memory
5	**Input and Output Devices:** keyboard, mouse, microphone, scanners, digital cameras, Output devices like: Video cards, The Monitor, Speakers
6	**Storage Systems:** Hard Disks , Floppy Disks , CD Drives and DVD Drives
7	**Printers:** Dot Matrix printers, Ink jet and Bubble jet printers, Laser printers, Combination Printers, Plotters.
8	**Troubleshooting:** Make a computer faster when it only runs slowly, Install new hardware, What to do if hardware stops working, Computer maintenance
9	**Software Applications:** What an Operating System is, What software is, How software is developed, Which software programs are for specific tasks.
10	**Using the Computer:** Start a computer, Reboot or reset the computer, Start an application programme, Handle data files within an application program, Exit an application program, Shut down the computer correctly
11	**Computer Applications 1:** Choosing An Application Program, & Software program that performs specific function.
12	**Computer Applications 2:** Word Processing, & Spread Sheets
13	**Computer Applications 3:** Presentations, Database Management, & Graphics
14	**Computer Applications 4:** Multimedia, Electronic Mail, & Web Browsing
15	**Computer Applications 5:** Utility Tools, Suites, & Specialized
Textbook	IC3 Certificate Books & Lecture
References	

Course Title	Physical Electronics	Theoretical hours/w	3
Course Code	CR115	Practical hours/w	3
Year	First	Tutorial hours/w	
Semester	First	Units	4

Course Description (Theory)

Week No.	Topics
1	Natures of atoms, energy levels, material types, and conductivity of conductors
2	Intrinsic semiconductors: current density and conductivity
3	extrinsic semiconductors(P ,N): current density and conductivity
4	Diode resistance (static, dynamic and average)
5	P-N junction construction , forward biasing and reverse biasing
6	Diode modeling, applications(logic gates)
7	Transition capacitance, diffusion capacitance
8	Rectifier (H.W.) and (F.W.)
9	Clipper and clamper circuits
10	Doublers and Tripler, Zener diode circuits
11	BJT construction and characteristic (i/p & o/p)
12	BJT configurations (CB, CE & CC), regions of operation
13	BJT biasing circuits (fixed bias and emitter-stabilized bias)
14	BJT biasing circuits (voltage divider bias and voltage feedback bias)
15	BJT switching circuits (inverter operation)
Textbook	**Title:** Electron device & Circuit Theory **Author:** Robert Boylested **Publisher:** Prentice-Hall, 10th Ed., 2008
References	

Course Title	Physical Electronics (Lab)	Theoretical hours/w	3
Course Code	CR115	Practical hours/w	3
Year	First	Tutorial hours/w	
Semester	First	Units	4

Course Description (Practical)

Week No.	Topics
1	Intro to devices
2	PN junction C/cs
3	Zener diode C/cs
4	Rectifier H.W.
5	Rectifier F.W.
6	Miscellaneous circuits
7	Clipper
8	Clamper
9	Doubler
10	Zener stabilizer
11	Review
12	BJT i/p
13	BJT o/p
14	BJT biasing
15	BJT amplifier
Textbook	**Title:** Electron device & Circuit Theory **Author:** Robert Boylested **Publisher:** Prentice-Hall, 10th Ed., 2008
References	

Course Title	English II	Theoretical hours/w	2
Course Code	UR121	Practical hours/w	-
Year	First	Tutorial hours/w	-
Semester	Second	Units	2

Course Description

Week No.	Topics
1	1.Sentences with multiple clauses ,coordinate connectors 2.Dates and time 3.essay writing ,essay topic
2	1. Sentences with multiple clauses, adverb clauses connectors (time, cause, condition, etc.) 2.expressing yourself 3.writing skills: decode the topic
3	1.Know when to use the past and the present , Use have and had correctly 2.common expressions 3.writing skills: develop supporting ideas
4	1.Comparatives and superlatives 2.common expressions 3.Writing skills: Introductory paragraph
5	1.Subject verb agreements 2.The processor 3.writing skills: Write unified supporting paragraphs
6	The first Exam
7	1.Use the correct tense with time expressions 2.operating system 3.Writing skills: write the concluding paragraph
8	1.use of will and would 2.common expressions 3.writing skills: connect the supporting paragraphs
9	1.Recognize active and passive meanings 2.countable and uncountable nouns,Articles with singulars, distinguish specific and general ideas 3.Online services
10	Second exam
11	1.Distinguish make and do 2.writing practice 3.programming Languages: C language
12	1.Distinguish like ,alike ,unlike ,and dislike 2.Comparing Software Packages 3.writing practice
13	1.Distinguish other, another, and others 2.Computer Networks 3.Writing practice
14	Practice
15	Practice
Textbook	• Keith Boecker, P. Charles Brown, Oxford English for Computing, Oxford University press. • Prentice Hall, Writing &Practice Communication in Action, Pearson, Prentice Hall.
References	• Longmann Preparation Course of the TOEFL test .the paper test • http://www.english for every one.com/

Course Title	Object Oriented Programming I (C++)		2
Course Code	CR121	**Practical hours/w**	3
Year	First	**Tutorial hours/w**	
Semester	Second	**Units**	3

Course Description

Week No.	Topics
1	Character array & String functions
2	2-Dim array & getline( ) function
3	Functions & Passing array to the functions
4	Overloaded functions
5	OOP Concept (object, class)
6	Private ,public ,and Member functions
7	Array within class
8	Array of object
9	Friendly functions
10	Constructor functions
11	Destructor function & This operator
12	Single & Multilevel Inheritance
13	Multiple Inheritance
14	Hierarchical inheritance
15	Hybrid Inheritance
Textbook	Object Oriented Programming in C++ Author: Robert Lafore Edition &Year Public: Fourth Edition ,2002
References	

Course Title	Object Oriented Prog. I(C++) Lab	Theoretical hours/w	2
Course Code		Practical hours/w	3
Year		Tutorial hours/w	0
Semester		Units	3

Lab Description

Week No.	Topics
1	**Introduction**
2	member function
3	Array of object
4	Friendly functions
5	Copy constructor
6	**Quiz1**
7	Constructing 2-dim array
8	Overloaded constructor
9	single inheritance
10	**Mid exam**
11	Multilevel inheritance
12	Multiple inheritance
13	**Quiz2**
14	Hybrid inheritance
15	**Final exam**
Lecturer Name: **Hana rashied** **Signature:**	**Text book:** object oriented programming in c++ **Author:** Robert Lafore **Edition &year published:** fourth edition ,2003

Course Title	Mathematics II	Theoretical hours/w	4
Course Code	CR122	Practical hours/w	-
Year	First	Tutorial hours/w	1
Semester	Second	Units	4

Course Description

Week No.	Topics
1	**Integration Methods I** Basic integration formulas, Integration by parts.
2	**Integration Methods II** Products & powers of trigonometric functions, Even powers of sines & cosines, Trigonometric substitutions in integrals.
3	**Integration Methods III** Integrals involving ax^2+bx+c, Partial fractions, $z=\tan(x/2)$, Improper integrals.
4	**Plane Analytic Geometry I** Conic sections, Equations from the distance formula, Circles.
5	**Plane Analytic Geometry II** Parabolas. Ellipses, Hyperbolas. Quadratic curves.
6	**Hyperbolic Functions** Definitions & identities, Derivatives & integrals, The inverse hyperbolic functions.
7	**Polar Coordinates I** Polar coordinates, Graphs of polar equations.
8	**Polar Coordinates II** Polar equations of conics & other functions, Integrals.
9	**Sequences & Infinite Series I** Sequences of numbers, Limits that arise frequently, Infinite series.
10	**Sequences & Infinite Series II** Tests of convergence of series with non-negative terms. Absolute convergence. Alternating series. Conditional convergence.
11	**Power Series I** Power series for functions, Taylors's theorem with reminder: Sines, cosines, & e^x.
12	**Power Series II** Further computations, logarithms, arctangent and π, Indeterminate forms, Convergence of power series. Integration, differentiation, Multiplication, & division.
13	**Partial Derivatives** Functions of two or more variables, Limits & continuity, Partial derivatives.
14	**Matrices & Linear equations I** Introduction, Matrix addition & multiplication, Elementary row operations & row reduction
15	**Matrices & Linear equations** II Inverses, Determinants & Cramer's rule, Inverse of a matrix.
Textbook	**Text Book:** Calculus & Analytic Geometry **Author:** Thomas & Finney **Edition & year public:** Pearson Education Inc,11th Ed 2008
References	

Course Title	Electrical Circuits	**Theoretical hours/w**	3
Course Code	CR123	**Practical hours/w**	3
Year	First	**Tutorial hours/w**	1
Semester	Second	**Units**	4

Course Description

Week No.	Topics
1	Fundamentals of DC circuits: circuit components, terms, types of sources, voltage & current dividers.
2	Ohms law , dc power, maximum power transfer.
3	Kirchhoff's laws: KCL , KVL.
4	Applications of Ohms law, KVL, KCL.
5	Superposition theorem, transposition theorem.
6	Thevenins theorem , Norton's theorem , applications.
7	Mesh analysis of Maxwell's equations
8	Nodal method analysis.
9	Ac circuits fundamentals: sinusoidal signal generation , time base, frequency, peak values, rms value & average values.
10	Response of inductors in ac circuits, R-L circuit.
11	Response of the capacitor in ac circuits , R-C circuit.
12	The R-L-C circuit in series , series resonance .
13	the R-L-C in parallel , parallel resonance, AC power & power factor.
14	Application of circuit theories for ac circuits, Thevenin’s theorem, and Norton’s theorem.
15	Application of mesh analysis & nodal method for ac circuit.
Textbook	Introduction to circuit analysis Robert L. Boylested 12th Ed., 2010
References	

Course Title	Electrical Circuits Lab	**Theoretical hours/w**	**3**
Course Code	CR123	**Practical hours/w**	**3**
Year	First	**Tutorial hours/w**	**1**
Semester	Second	**Units**	**4**

Lab Description

Week	Topics
1	Fundamentals of circuit lab& instruments , how to write the lab report.
2	Applying & proving Ohms law , dc power, maximum power transfer.
3	Applying & proving Kirchhoff's laws: kcl , kvl.
4	Composition Applications of ohms law, kvl,kcl.
5	Applying of Superposition theorem ,transposition theorem.
6	Applying & proving Thevenins theorem , Applying & proving Norton's theorem , applications
7	Application of Mesh analysis of Maxwell's equations
8	Proving Nodal method analysis.
9	Ac circuits fundamentals: sinusoidal signal generation ,measuring & control of time base, frequency, peak values, rms value & average values
10	Application of Response of inductors in ac circuits, R-L circuit, effect of frequency for inductors impedance
11	Application of Response of the capacitor in ac circuits , R-C circuit capacitors impedance, effect of frequency
12	The R-L-C circuit in series , series resonance,application & measurements .
13	the R-L-C in parallel , parallel resonance, AC power & power factor.
14	Application of circuit theories for ac circuits , Theremins theorem, &Norton's theorem
15	application of mesh analysis & nodal method for ac circuit.

Signature: **Lecturer Name:**	**Text book:** Introduction To Circuit Analysis **Author :** Robert L. Boylested **Edition & Year public :** Merill publishing company 2010

Course Title	Eng. Drawing & CAD	**Theoretical hours/w**	1
Course Code	CR124	**Practical hours/w**	2
Year	First	**Tutorial hours/w**	-
Semester	Second	**Units**	2

Course Description

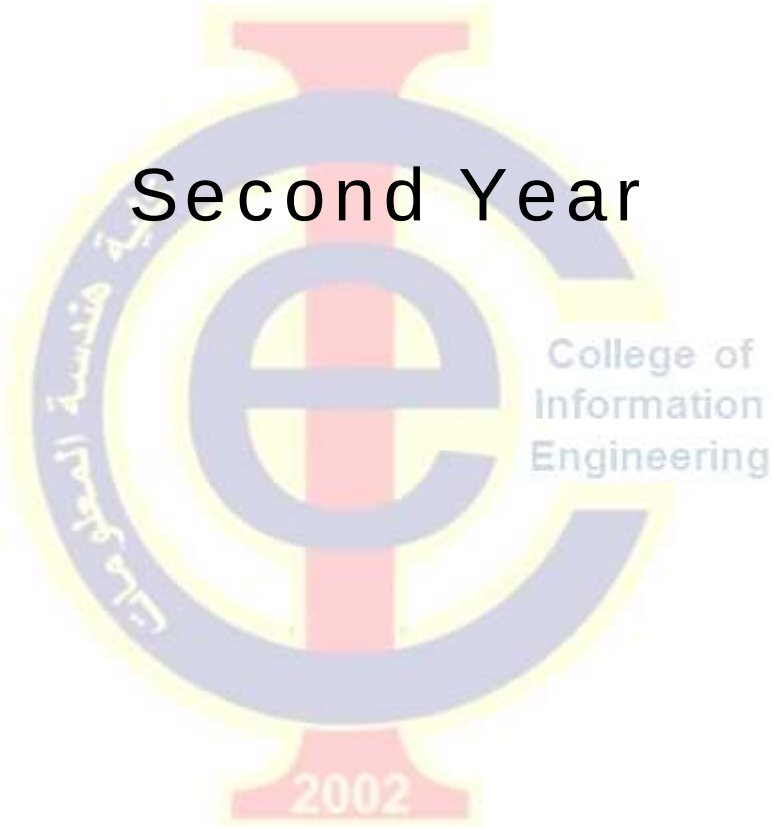
Week No.	Topics
1	Engineering Drawing tools and Lines in engineering drawing and exercises
2	The Engineering Line and exercises
3	The Engineering operations and exercises
4	Class work
5	The projections theory and exercises
6	Introduction to AutoCAD and explanation of Draw toolbar
7	Draw toolbar and Modify toolbar and class work
8	Modify toolbar and class work
9	Blocks and class work
10	Hatch and Table and Text and class work
11	Layers and class work
12	Dimensions and class work
13	Mid-term exam
14	The projections and class work
15	Introduction to 3d Design
Textbook	1. Miriam Ochoa, Introducing AutoCAD 2008**,** Wiley**,** 2010 2. Exercises in machine drawing, S. Bogolyubov, 1982.
References	

Course Title	Internet Programming I	Theoretical hours/w	2
Course Code	ICE121	Practical hours/w	2
Year	First	Tutorial hours/w	1
Semester	Second	Units	3

Week No.	Topics
1	**Introduction to HTML :** Introduction to Internet programming, HTML language, Description and running through IE, How to write codes in HTML?, Headings, titles. The body in HTML language, background colors, pages and breaks
2	**Lists & Tables in HTML language :** Ordered list and unordered list, creating table, table attributes and features
3	**Images & Links :** Images , Combining paragraphs with table and images., insert Links, types of links, linked image,
4	**Forms in HTML I:** Command buttons, Text fields and text areas, Checkboxes and radio buttons.
5	**Forms in HTML II :** Select lists in Forms, combining Forms with images and tables,
6	**HTML CSS:** Style CSS,CSS Syntax, Inline CSS, Internal CSS, External CSS
7	**HTML Blocks:** html <Div> element , <Span> element
8	**Client-Side Programming and Server-Side Programming :** Client-Side Programming and Server-Side Programming, JavaScript, What is JavaScript, What JavaScript can do?, What JavaScript can't do?, The Script Tag, JavaScript Statements, Script statement execute, JavaScript data types, Variables, Data type conversions
9	**Arithmetic Operators :** Arithmetic operators, Comparison operators, Examples and solutions Control Structures (if statement, if-else statement), Loops (for loop), Functions, Function parameters
10	**Variable scope in JavaScript :** Arrays, creating, assignment and accessing array data, Document object in arrays, Array methods,
11	**Window and Document objects :** Window and Document objects, the window object, creating window, properties and methods: window.alert, window.prompt the document object, document.write, document.writeln
12	**Math and Date :** Math functions and Date object creation, Date to string, parse Date, get Date, set Date.
13	**The events I:** The event object, Event handler, Event properties, Window event-handler,
14	**The events II**: layer event handler, mouse event handler, other event handlers
10	**Images and dynamic HTML :** Images and dynamic HTML, the image object, interchanging images, prechaching images, creating image rollover,

Lecturer Name: **Signature:**	**Text book-1:** The Complete Internet and World Wide Web Programming Training course **Author :** Harry M.Deitel, Paul J. Deitel, Tom Nieto **Edition & Year public :** Prentice Hall PTR,2000 T**extbook-2**: Java script : the definition Guide, **Author :**David Flanagan, O'Reilly Media **Edition & Year public :** 5th edition , 2006

Second Year



Course title	Arabic Language	**Theoretical hours/w**	**2**
Course code	UR211	**Practical hours/w**	**0**
Year	Second	**Tutorial hours/w**	**0**
Semester	First	**Units**	**2**

Course Description

Topics	Week No.
الجملة الاسمية المبتدأ وانواعه ، الخبر وانواعه، نواسخ الابتداء ، كان واخواتها، ان واخواتها	**1**
المثنى والملحق به، جمع المذكر السالم والملحق به	**2**
جمع المؤنث السالم، الاسماء الخمسة	**3**
الجملة الفعلية **بناء الفعل الماضي، بناء فعل الامر**	**4**
الفعل المضارع، بناؤه واعرابه،	**5**
الاسماء المنصوبه، المفعول به، المفعول المطلق، المغعول فيه، المفعول معه	**6**
معاني حروف الجر	**7**
الشعر قصيدة قديمة: المتنبي، ابن زيدون	**8**
قصيدة حديثة: سامي مهدي	**9**
القرآن الكريم سورة مريم	**10**
الاملاء كتابة الهمزة المتوسطة والمتطرفة	**11**
كتابة الضاد والظاء، كتابة التاء القصيرة والطويلة	**12**
علامات الترقيم	**13**
الاغلاط الشائعة في المكاتبات الرسمية ، كتابة العدد	**14**
الشعر : قصيدة جاهلية: معلقة عمرو بن كلثوم التغلبي قصيدة عباسية: علي بن الجهم قصيدة حديثة: نزار قباني	**15**

المصدر **المؤلف:** **الناشر وسنة الطبع:**	محاضرات في اللغة العربية
المراجع	

Course Title	Object Oriented Programming II (Java)	Theoretical hours/w	2
Course Code	CR211	Practical hours/w	3
Year	Second	Tutorial hours/w	0
Semester	First	Units	3

Course Description

Week No.	Topics
1	Introduction what is java, why learn java, compiling & running first program
2	Java basics Statement &expression, Variables & data types, Comments, Number literals, Boolean literals, Character literals, String literals, Expression & operators
3	Conditional statements Logical operators, Bitwise operators, Operator precedence, Switch conditionals
4	Loops For loop, While & do while
5	Methods &Static Methods
6	Manipulation string
7	Working with objects
8	Inheritance & Polymorphism
9	Continues of Inheritance & Polymorphism
10	Exception Handling
11	Thread &Multithread
12	GUI(Graphical User Interface)components
13	Networking(Manipulating URLs)
14	Reading a File on a Web Server
15	Establishing a Simple Server Using Stream Sockets
Textbook	**Title:** java "How to program" **Author:** H.M.Deitel, **Edition &year of publication** :: Sixth edition ,2004
References	

Course title	Object Oriented Prog. II (Java) Lab	Theoretical hours/w	2
Course code	CR211	Practical hours/w	3
Year	Second	Tutorial hours/w	0
Semester	First	Units	3

Course Description

Week No.	Topics
1	
2	**Introduction to Java Compiler** compiling & running first program
3	**Java basics** - Defining variables. - Printing variables.
4	**Conditional statements** - If Statement - If . . .else - Nested If.. .else
5	**Loops** - For loop - While & do while
6	**Reading From Keyboard** - Reading Variables - Using variables and printing them.
7	**Methods** - Defining method - Calling method - Different uses of methods
8	**Classes and Objects** - Creating Classes. - Defining objects - Using objects
9	**Working with objects**
10	**Files and Streams** - Creating Files. - Writing To files. - Reading from files.
11	**Working with Files**
Text book	**Text book:** ”java How to program” **Author:** H.M. Deitel **Edition &year published :** 7th Ed., 2006
References	

Course title	Electronics	Theoretical hours/w	3
Course code	CR212	Practical hours/w	3
Year	Second	Tutorial hours/w	0
Semester	First	Units	4

Course Description

Week No.	Topics
1	Review of BJT : construction, current equation , configurations, biasing circuits.
2	BJT ac equivalent circuit (h-parameter)
3	BJT ac equivalent circuit(re model)
4	Input equivalent impedance ,output equivalent impedance, voltage gain and current gain
5	FET: types, construction, current equations ,characteristic, configuration, biasing circuits and analysis
6	JFET : AC equivalent circuits and amplifiers
7	Frequency response of amplifiers
8	Multistage Direct coupled, and Capacitor coupled
9	Multistage transformer coupled
10	Feedback circuit C.S. C.SH
11	Feedback circuit V.S V.SH
12	OP-AMP and applications
13	Power amplifiers(class A, B)
14	Power amplifiers(class AB, C)
15	Oscillators (overview)
Text book	**Text book:** electron devices & circuits **Author:** G. S. N. Raju **Edition &year published :** I.K. Inter. publications, New Delhi**,** 2006
References	

Course title	Electronics Lab	Theoretical hours/w	3
Course code	CR212	Practical hours/w	3
Year	Second	Tutorial hours/w	0
Semester	First	Units	4

Lab Description

Week No.	Topics
1	Biasing circuits
2	BJT Amplifier I
3	BJT Amplifier II
4	FET C/cs
5	FET amplifier. I
6	FET amplifier. II
7	Frequency response
8	Multistage I
9	Multistage II
10	F.B. I
11	F.B. II
12	Op-Amp I
13	Op-Amp II
14	Power amplifier
15	Oscillator
Text book	**Text book:** electron devices & circuits **Author:** G. S. N. Raju **Edition &year published :** I.K. Inter. publications, New Delhi**,** 2006
references	

Course Title	Engineering Analysis	Theoretical hours/w	4
Course Code	ICE213	Practical hours/w	0
Year	Second	Tutorial hours/w	2
Semester	First	Units	4

Course Description

Week No.	Topics
1	Introduction to numerical methods, absolute and relative errors, computer errors, review of Taylor series
2	Roots of equations, graphical methods, Bisection methods, Newton methods, Secant methods, system of nonlinear equations
3	System of linear equations, Gaussian elimination, Gauss – Jordan method
4	Methods of least squares, linear regression, multiple regression Interpolation Newton's Divided difference method, Lagrange interpolation
5	Numerical integration, Trapezoid rule, Simpson's rule Numerical differentiation, estimating derivatives, Richardson extrapolation
6	Linear Equations & Matrices Linear Systems, Matrices, Properties of Matrix Operations, Solution of Equations, The Inverse of Matrix.
7	Determinants, Definitions & Properties, Cofactor Expansion & Applications
8	Vectors & Vector Spaces ,vectors plane, n-vectors, cross product in R3 Vector Spaces & Subspaces, Linear Independence, Basis & Dimensions.
9	Linear independence, Basis & Dimensions The Rank of a Matrix & Applications, Orthogonal Basis in Rn
10	Linear Transformations & Matrices I Definition & Examples, The Kernal & Range of a Linear Transformation. The matrix of linear transformation, Applications.
11	Eigen values & Eigenvectors, Diagonalization of Symmetric matrices.
12	Ordinary Differential Equations (ODEs) I Basic concepts, Separable ODEs, modeling, Exact ODEs
13	Ordinary Differential Equations (ODEs) II, Integrating factors, linear ODEs, Bernoulli equations, Second-Order linear ODEs, Homogeneous with constant coefficients, nonhomogeneous linear ODEs of second order
14	Second-Order linear ODEs II Euler-Cauchy equations, Non-homogeneous ODEs.
15	Introduction to Fourier analysis, Fourier series, Fourier transform.

Text book	**Text Book : Numerical Methods for Engineers** **Author : Steven C. Chapra and Raymond P. Canal** **Edition & Year Puplic: 5th Edition**
Reference	**Title :** Advanced Engineering Mathematics **Author :** Erwin Kreyszig **Edition & Year of publication :** 9th Edition 2006

Course Title	**Subject :** Statistical Information Theory	**Theoretical hours/w**	**2**
Course Code	**Code:** ICE211	**Practical hours/w**	**0**
Year	**Year :** Second	**Tutorial hours/w**	**1**
Semester	**Semester:** First	**Units**	**2**

Course Description

Week No.	Topics
1	Review of Sets Theory, Permutation and Combination. Frequency distribution; Raw Data, Frequency Distribution Histogram, Frequency Polygons.
2	Relative Frequency Distribution, Cumulative Frequency Distribution, Ogives , Frequency Curve. The mean, median, mode, geometric mean, harmonic mean, RMS, mean square value.
3	Measures of dispersion; the mean deviation, the standard deviation and variance. Relations between frequency distribution and mean, media, medium. Elementary prob. Theory, axioms of probability
4	Joint prob. Random Experiment, independent and mutually exclusive events. Conditional probability. The binary symmetric channel example. Total probability, repeated (Bernoulli) trials
5	Moments for grouped data, moment about the origin and about the mean. Skewness and kurtosis. Applications of 1st and 2nd moments.
6	Random variables. Discrete and Continuous Random variable. Prob. density function (pdf) and cumulative distribution function (cdf).
7	The expectations of discrete and continuous random variables. Some important distributions; the uniform distribution, the binomial and Poisson distributions. The normal (Gaussian) distribution; Area under normal curve, the use of tables to calculate prob. for normal distribution. The definition of Q_Function and its applications
8	Joint random variables; joint pdf, joint cdf, joint moments and expectations. Functions of random variables and their expectations. Summation of random variables, Transformation of random variables.
9	Independent, Orthogonal & uncorrelated random variables The Chi-Square Test For Random Distribution Line Regression and Estimation Theory. Random processes. Types and properties, Stationary, ergodic, nonstationary
10	Expectations of random processes, Autocorrelation, Autocoveriance Model of information transmission system. Common sense definition of information,
11	Logarithmic measure of information. Self information. Average information (entropy) of a discrete and continuous source, Maximum source entropy, source efficiency.
12	Transition probability matrix of channel, Discrete noiseless and noisy channel models, uniform channel. Definition of mutual information & the average mutual information
13	Information transmission over symmetric channel, noiseless channel, Binary symmetric channel, Ternary symmetric channel
14	Capacity of discrete channel, Channel capacity for noiseless channels, Channel efficiency and redundancy. Channel capacity for symmetric channels. Channel capacity for nonsymmetric channels, binary nonsymmetric channel.
15	Mutual information of continuous channel, Capacity of continuous channels. Efficiency and redundancy of continuous channels. Gaussian and uniform channels. Sampling of continuous source, Sampling Theorem, Nyquist theorem for transmission over band limited continuous channel. Shannon-Hartly channel capacity theorem.
Text Book	**title:** Probability & Statistics for Engineers and Scientists **Author :** Walpole & Myers **Edition/Year/ Publisher :** 8th , 2007 , Pearson Prentice Hall
References	**title:** Essentials of Information Theory **Author :** P.G. Farrell **Edition/Year/ Publisher :** 1st, 2006 , Prentice Hall

Course Title	Database Systems & Data Structures	Theoretical hours/w	2
Course Code	ICE212	Practical hours/w	3
Year	Second	Tutorial hours/w	1
Semester	First	Units	3

Course Description

Week No.	Topics
1	Introduction: basic terminology, Operations to the Data Structure, the Need for Data Structures, Organizing Data, Selecting a Data Structure, Data Types, Algorithms complexity: algorithm specification, properties, describing algorithms, Algorithms complexity: algorithm specification, properties, describing algorithms.
2	Performance analysis: space complexity, examples of evaluating space complexity, time complexity, examples of determining steps. Array: the Array ADT, arrays in C, Array name versus element name, declaring a 1D Array, Array Indices, Accessing Array Elements, Invalid Array Usage, Array Initialization, Multi-dimensional arrays, Memory layout, Operations on array.
3	Functions: What Is a Function?, Declaring and Defining Functions, Local Variables, Global Variables, Return Values, Overloading Functions, Inline Functions. Structures and Unions , the polynomial ADT, Pointers, Declaring Pointers, Using a Pointer, File Handling.
4	Introduction to Stacks: Selecting Storage Structure, Implementation of the Operations, Applications of Stack. Queues: The Queue Abstract Data Type, Implementation 1 : createQ, isEmptyQ, isFullQ.
5	Circular Queue: Add to a circular queue, Delete from a circular queue, Numeric for Circular Queues, The mod Operator. Linked List: introduction, Possible Improvements, What is a Dynamic Data Structure?, Linked Representation, Advantages of linked list
6	Doubly-Linked Lists, Advantages over Singly-linked Lists, Insertion into a Doubly-Linked List, Removal from a Doubly-Linked List
7	Tree Data Structures: Binary Trees, Binary Search Trees, Balanced Search Trees, Graph Data Structures.
8	An Overview of DB Management DBMS contains information about a particular enterprise, Database Applications, Drawbacks of using file systems to store data,
9	Data Models, Design Approaches, The Entity-Relationship Model Database System Architecture(1): Objectives of Three-Level Architecture
10	Database System Architecture(2): The database management system, Data communications, Database System Architecture(2): Client/server architecture, Utilities, Distributed processing
11	Relational Model: structure of relational DBs, DB schema, Keys, Schema Diagrams, relational Query, relational Operations , Relations: domains, types, values, variables, Relational Algebra: Select, Projection, Union, Set Difference, Cartesian Product, Join
12	Relational Algebra: Select, Projection, Union, Set, Relational Algebra: Select, Projection, Union, Set Difference, Cartesian Product, Join Relational Calculus: Example Queries, Formal Definition, Safety of Expressions
13	Relational Calculus: Domain Relational Calculus, Integrity Constraints: constraints on a single relation, not null constraint, unique constraint
14	Integrity Constraints: the check clause, referential integrity, violation during a transaction
15	Views: view definition, using views in SQL Queries, materialized views, update of a view
Text book	
Reference	

Course Title	Database Systems lab	Theoretical hours/w	2
Course Code	ICE212	Practical hours/w	3
Year	Second	Tutorial hours/w	1
Semester	First	Units	3

Lab Description

Week No.	Topics
1	Overview of the SQL Query Language
2,3	Data Definition, Domain Types in SQL, Create Table Construct,
4	Integrity Constraints in Create Table
5,6	Drop and Alter Table Constructs, Aggregate Functions: avg, min, max, sum, count, Null Values: Null Values and Aggregates
7,8,9	Drop and Alter Table Constructs, Aggregate Functions: avg, min, max, sum, count, Null Values: Null Values and Aggregates Nested Subqueries
10	Nested Subqueries Modification of the Database
11	Modification of the Database
12,13	Advanced SQL: Accessing SQL From a Programming Language Advanced SQL: Functions and Procedures

Course Title	Digital Electronics	Theoretical hours/w	2
Course Code	CR221	Practical hours/w	3
Year	Second	Tutorial hours/w	-
Semester	Second	Units	3

Course Description

Week No.	Topics
1	Introduction to binary adder & subtractor, ROM, RAM.
2	Cell Arrays, memory expansion.
3	Flip-flop basic circuit, R-S FF, D-FF, J-K FF, T-FF, Edge-triggered FF.
4	Counters, Ripple counter, binary counters.
5	Synchronous counters, up-counter, down-counter. Up-down counter.
6	Excitation tables of flip-flops.
7	Design of random counters using RS FF.
8	Design of random counters using other types of FFs.
9	Registers.
10	Shift registers (SISO, SIPO, PIPO, PISO), and applications.
11	Design of clocked sequential circuits.
12	Analysis of clocked sequential circuits.
13	State tables.
14	State diagram.
15	State equations.
Textbook	Digital Design, M. Morris Mano & D. Michael, Prentice-Hall, 4th Edition, 2009.
References	Digital Fundamentals, Thomas L. Floyd, Prentice-Hall, 9th Edition, 2006.

Course Title	Digital Electronics Lab	Theoretical hours/w	2
Course Code	CR221	Practical hours/w	3
Year	Second	Tutorial hours/w	0
Semester	Second	Units	3

Lab Description

Week No.	Topics
1	RS- Flip Flop
2	D-Flip Flop
3	J-K, T-Flip Flop
4	Asynchronous Counters
5	Synchronous Counters
6	Module Counters
7	Decade Counters
8	Johnson Counters
9	Mid Exam
10	Shift Register
11	LFSR
12	Ring Counters
13	DAC
14	ADC
15	Exam
Text book	**Text Book :** Digital Design **Author :** Morris Mano **Edition & Year Public:** Prentice Hall, 4th Ed., 2006
Reference	

Course Title	Coding and Data Compression	**Theoretical hours/w**	**3**
Course Code	ICE221	**Practical hours/w**	**0**
Year	Second	**Tutorial hours/w**	**0**
Semester	Second	**Units**	**3**

Course Description

Week No.	Topics
1	Review of Information Theory: Self and mutual information, Entropy and its relation to information. Shannon Theorem and the need for source and channel coding
2	Source encoding; fixed and variable length codes, Average length of source code, Source code efficiency and redundancy. Prefix & Decodable codes.
3	Shannon-Fano source coding. Huffman source coding, compact codes, source extension for source coding.
4	Memory and Memory less Sources, Entropy of Markovian sources.
5	**Data Compression –I** : Basic idea and advantages, Types and Categorization, Performance measures, Some applications
6	**Data Compression –II :** Statistical compression techniques, Run-length coding, Dictionary based source coding, LZ methods.
7	**Data Compression –II :** Dictionary based source coding, LZ methods. **Data Compression –III:** Transform domain approaches for Audio, Image, Video compression
8	Channel Coding and Error Control techniques; The channel coding, Main idea of error correction & detection codes, code rate (efficiency), advantages and disadvantages.
9	Parity check codes, ARQ Techniques
10	Linear block codes, Binary repetition codes, Matrix representation of linear block codes Generator and Parity Matrices, Hamming codes, syndrome decoding.
11	Code distance and error correction capability of linear block codes Multiple error correction and Hamming bound.
12	Cyclic Redundancy Check (CRC) codes and Polynomial representation of block codes. Use of shift registers in CRC implementations. Some examples of practical implementations of CRC.
13	GF (2^m) field definition, Construction of finite field elements, mathematical operations in GF field.
14	Generation of BCH codes using GF field (single and multi-error corrections) BCH encoder/decoder circuit
15	Convolutional Codes, generation, decoding algorithm.
Text Book	**Text Book-1:** Essentials of Information Theory **Author :** P.G. Farrell **Edition/Year/ Publisher :** 1st, 2006 , Prentice Hall
Reference	**Text Book-2:** Data Compression; The Complete Reference Guide **Author :** David Salomon **Edition/Year/ Publisher :** 3rd Edition, 2006, Springer.

Course Title	Microprocessor Architecture & Interfacing	Theoretical hours/w	3
Course Code	ICE222	Practical hours/w	3
Year	Second	Tutorial hours/w	0
Semester	Second	Units	4

Course Description

Week No.	Topics
1	Introduction to Microprocessors and Microcomputers.
2	Software Architecture of the 8088 and 8086 Microprocessors I Microarchitecture of the 8088/8086, Software Model, Memory Address Space, Data Types.
3	Software Architecture of the 8088 and 8086 Microprocessors II Memory Segmentation, Instruction Pointer, Data Registers, Pointer and Index registers, Status register, Generating Memory Address.
4	Assembly Language Programming.
5	Addressing Modes.
6	Data Transfer Instructions.
7	Arithmetic and Logic Instructions.
8	Control Flow Instructions.
9	Program Structures..
10	Memory Interface.
11	I/O Interface.
12	The Programmable Peripheral Interfaces (8255A).
13	Interrupt Interface of the 8088 and 8086 Microprocessors.
14	Programmable Interrupt Controller (8259A).
15	The Programmable Interval Timer.

Text book	**Text book(1) :** The 8088 and 8086 Microprocessors **Author :** Walter A. Triebel & Avtar Stringh **Edition & Year public : Fourth, 2003**
Reference	**Title:** The Intel Microprocessors **Author :** Barry B. Brey **Edition & Year public :Eighth, 2008**

Course Title	Microprocessors Architecture And Interfacing Lab	Theoretical hours/w	3
Course Code	ICE222	Practical hours/w	3
Year	Second	Tutorial hours/w	0
Semester	Second	Units	4

Lab Description

Week No.	Topics
1	Introduction to the 8086 Single Board Microcomputer
2	Binary Arithmetic
3	Branching and Decision Making
4	Bit Manipulation
5	Subroutine and the Stack
6	BCD Arithmetic
7	String Handling Operation.
8	Input / output Instruction Set
9	Seven segment Interfacing
10	Square traffic Light
11	Light Detected Resistor (LDR).
12	IC tester

Course Title	Internet Programming II	Theoretical hours/w	2
Course Code	ICE223	Practical hours/w	2
Year	Second	Tutorial hours/w	0
Semester	Second	Units	3

Course Description

Week No.	Topics
1	Web Server; What is PHP; Why PHP; A Brief History of PHP; Configuring PC to work as a server PHP Scripting
2	Basic PHP Syntax; Comments in PHP; Variable Naming and setting; Rules; Data Types; PHP Operators
3	Arrays; Object and Object Initialization
4	Variables:
5	Constant; Expression
6	Control Structure; conditional statement, Switch statement
7	Loops
8	Functions (function Define, function argument)
9	Function (class and objects)
10	Cookies, error handling
11	Function Reference: mathematical function
12	Function Reference: Array functions
13	Function Reference：Calendar Function
14	Function Reference: Comparison Functions and directory
15	Function Reference:Image Function

Text book	**Text book:** PHP5 & MySQL5 from novice to professional **Author :** W. Jason Gilmore **Edition & Year public :** 2nd Edition, 2006
Reference	

Course Title	Internet Programming II Lab	Theoretical hours/w	2
Course Code	ICE223	Practical hours/w	2
Year	second	Tutorial hours/w	0
Semester	Second	Units	3

Lab Description

Week No.	Topics
1	Web Server; What is PHP; Why PHP; A Brief History of PHP; Configuring PC to work as a server PHP Scripting
2	Basic PHP Syntax; Comments in PHP; Variable Naming and setting; Rules; Data Types; PHP Operators
3	Arrays; Object and Object Initialization
4	Variables:
5	Constant; Expression
6	Control Structure; conditional statement, Switch statement
7	Loops
8	Functions (function Define, function argument)
9	Function (class and objects)
10	Cookies, error handling
11	Function Reference: mathematical function
12	Function Reference: Array functions
13	Function Reference : Calendar Function
14	Function Reference: Comparison Functions and directory
15	Function Reference:Image Function

Text book	
Reference	

Course Title	Transmission Line Theory	**Theoretical hours/w**	**2**
Course Code	ICE224	**Practical hours/w**	**0**
Year	Second	**Tutorial hours/w**	**1**
Semester	Second	**Units**	**2**

Course Description

Week No.	Topics
1	**Related Mathematical Topics** Vector algebra, coordinate systems and transformation, Vector calculus
2	**Electric fields in material space** Properties of materials, conductors, dielectrics.
3	**Magnetization in materials** Magnetization in material, classification of magnetic materials
4	**Maxwell Equations** Farady's Law, Motional EMF, Maxwell Equation in final forms, Time varying potentials, Time harmonic fields.
5	**Electromagnetic wave propagation** Wave in general, wave propagation in : lossy dielectric, lossles dielectric, free space, good conductors.
6	Modeling of transmission lines using distributed parameters , T.L equation, Input impedance.
7	Reflection and transient response of T.L
8	VSWR, Reflection Coefficients, Power, efficiency of T.L
9	Wave equation for the case of lossless TL and the distortionless case.
10	Evaluation of the propagation constants and the effects of changing the operating frequency.
11	Study the effects of reflections in different line and load conditions
12	Use of transmission line charts (Smith charts) to evaluate T.L. parameters
13	**Matching of T.L :** Quarter-wave and stub tuners matching techniques, Design of matching elements using Smith chart
14	Properties, parameters and elements of optical fibers and optical systems.
15	Main types and applications of optical fibers.

Text book	**Text book:** Elements of Electromagnetics **Author :** Sadiku **Edition/Publisher:** , 5th Ed**,** John Wiley & Sons, 2009
Reference	

Course Title	Computer Network	Theoretical hours/w	2
Course Code	ICE225	Practical hours/w	3
Year	Second	Tutorial hours/w	1
Semester	Second	Units	3

Course Description

Week No.	Topics
1	Introduction, Basic Network Concepts, client and server,
2	Network Topologies, Bus, Ring, Star. Cabling Media
3	Basic Network Hardware, Medium Access Control and medium Access Methods
4	LAN Architecture
5	The OSI Model, Description of the 7th Layer System
6	The physical Layer and data link layer
7	The network layer and IP routing
8	The transport layer
9	The session, presentation and Application layer
10	The Cisco three hierarchal model
11	IP addressing and classes, Idea of subnetting
12	ATM networks
13	Wide area networks
14	Wireless networks, Wireless LAN, Wireless WAN
15	Wireless Sensor Networks

Text book	**Text book(1):** *Computer Networks,* A.S. Tanenbaum, 4th Edition, 2003.
Reference	**Text book(2):** Computer Networks, Peterson & Davie, 2nd Edition.

Course Title	Computer Network Lab	Theoretical hours/w	2
Course Code	ICE225	Practical hours/w	3
Year	Second	Tutorial hours/w	0
Semester	Second	Units	3

Lab Description

Week No.	Topics
1	Analysing number of transmitting nodes vs. collision count, mean delay for Ethernet LAN .
2	Analysing bus vs. star-switch with respect to number of collisions (for a fixed number of transmitting nodes) for Ethernet LAN
3	Analysing performance of token ring with number of nodes vs. response time, mean delay using NetSim.
4	Comparing the throughput and normalized throughput for token ring and token bus for different transmitting nodes.
5	Comparing the CSMA/CD vs. CSMA/CA protocols (for a fixed number of transmitting nodes).
6	Analysing the difference between unicast and broadcast transmission (for a fixed number of transmitting nodes).
7	Verification of stop-and-wait protocol.
8	Verification of Go-back-N protocol.
9	Verification of Selective repeat protocol.
10	Verification of distance vector routing algorithm.
11	Verification of link state routing algorithm.
12	Some programming techniques in socket programming.

Text book	

Third Year

Course Title	Communication Systems	Theoretical hours/w	3
Course Code	CR311	Practical hours/w	3
Year	Third	Tutorial hours/w	1
Semester	First	Units	4

Course Description

Week No.	Topics
1	**Elements of Communication systems** **Review of Signals & Systems I:** Classification of Signals, Fourier Series, Line Spectrum, Signal and system bandwidths, single-tone and multi-tone signals.
2	**Signals & Systems II:** Fourier Transform, Modulation Property, Signal bandwidth, Linear Time Invariant System.
3	**Signals & Systems III:** Ideal Filters, Power and Energy spectral density, Noise in Communication Systems. Signal-to-Noise Ratio
4	**Linear Modulation (Amplitude Modulation) I:** Double-Side-Band Suppressed Carrier (DSB-SC), Double-Side-Band with Large Carrier (DSB-LC).
5	**Linear Modulation (Amplitude Modulation) II:** Single-Side-Band (SSB), Vestigial Side Band, Quadrature Amplitude Modulation (QAM)
6	**Linear Modulation (Amplitude Modulation) III:** Effects of noise and Interference on AM signals, The use of frequency Mixers in communication systems, Frequency Division Multiplexing.
7	**Carrier Recovery Circuits :** Signal Squaring, Coast's Loop, Phased Locked Loop **AM Super-heterodyne Receiver**
8	**Angle Modulation I:** Frequency Modulation (FM), Phase Modulation (PM), Spectrum of Angle Modulated Wave.
9	**Angle Modulation II:** Narrow & wideband Case, The Phased Locked Loop Principles & Applications, Generation & Reception of FM Signal.
10	**Angle Modulation III:** FM stereophonic system, FM Standard Radio Receiver, Comparison of FM to AM signals (BW and S/N)
11	**Sampling & Pulse Modulations:** Sampling Theorem, Shannon Theorem, Pulse Amplitude Modulation (PAM), Time Division Multiplexing, Pulse Width Modulation (PWM), Pulse Position Modulation. (PPM).
12	**Pulse Code Modulation (PCM):** PCM for speech signals, Uniform and Non-uniform Quantizers, Differential PCM, PCM-TDM, Digital Multiplexing (E1 & T1 systems)
13	**Delta Modulations (DM):** Linear Delta Modulation, DM with Double Integrations, Delta Sigma Modulation, Adaptive DM **Carrier Modulated Digital Signals I:** Baseband and Passband Transmission, Amplitude Shift Keying (ASK), On-Off Keying (OOK), Phase Shift Keying (PSK)
14	**Carrier Modulated Digital Signals II:** Differential PSK and QPSK, Frequency Shift Keying (FSK), Minimum Shift Keying (MSK) & Bandwidth Versus Transmission Rate Comparison of Different Signals.
15	**Carrier Modulated Digital Signals III:** Pulse Shaping Transmission Formats, Optimum Detection of Baseband Digital Signals (Polar, Unipolar), Matched Filter Detection of Modulated Digital Signals.
Textbook	**Text book:** B.P. Lathi, Modern digital and analog communication systems, 4nd Edition, 2009.
References	

Course Title	Communication Systems Lab	Theoretical hours/w	3
Course Code	CR311	Practical hours/w	3
Year	Third	Tutorial hours/w	1
Semester	First	Units	4

Lab Description

Week No.	Topics
1	Active Filters-I (LPF)
2	Active Filters-I (LPF)
3	Active Filters-II (HPF)
4	Amplitude Modulation and Demodulation
5	Diode as AM detector
6	Frequency Modulation
7	Phased Locked Loop -I
8	Phased Locked Loop -II
9	Fiber Optics
10	AM/FM radio through Fiber Optics link
11	Pink noise Measurements
12	
13	
14	
15	
Textbook	**Text book:** B.P. Lathi, Modern digital and analog communication systems, 4nd Edition, 2009.
References	

Course Title	Project Management	Theoretical hours/w	2
Course Code	CR312	Practical hours/w	-
Year	Third	Tutorial hours/w	1
Semester	First	Units	2

Course Description

Week No.	Topics
1	Introduction, Modern Project Management, project definition, project life cycle
2	Organization strategy, goals and objectives, project portfolio management system
3	Project classification, Project Selection, financial criteria, nonfinancial criteria, selection model
4	Project management organization, organization, choosing the right structure
5	Organization culture, culture characteristics, implication of culture on projects
6	Defining the Project, project scope, priorities, work breakdown
7	Integration WBD, coding the WBD, project communication plan
8	Estimating a Project, quality of estimates, top-down versus bottom-up, time & cost
9	Level of details, type of costs, refining estimates, creating database
10	Developing project network, constructing network, activity-on-node (AON)
11	Network Computation Process, Forward and Backward Pass Information, Level of Detail, Practical Considerations, Extended Network Techniques to Come Closer to Reality
12	Resource Constraints, Classification of a Scheduling Problem, Resource, Allocation Methods, Computer Demonstration of Resource-Constrained Scheduling, Splitting Activities
13	Benefits of Scheduling Resources, Assigning Project Work, Multiproject, Resource Schedules, Develop a Project Cost Baseline
14	Rationale for Reducing Project Duration, Options for Accelerating Project Completion, Project Cost–Duration Graph
15	Constructing a Project Cost–Duration Graph, Practical Considerations, What if Cost, Not Time, Is the Issue?
Textbook	Clifford F. Gray, Erik W. Larson , Project Management: The Managerial Process, 5th Ed., McGraw-Hill, 2011
References	

Course Title	Computer Architecture	**Theoretical hours/w**	**3**
Course Code	ICE311	**Practical hours/w**	**0**
Year	Third	**Tutorial hours/w**	**0**
Semester	First	**Units**	**3**

Course Description

Week No.	Topics
1	Introduction: organization and architecture structure and function.
2	Computer evaluation and performance : history of computer , designing for performance , Pentium and power PC evolution
3	Computer function and interconnection (I) :computer components , computer functions
4	Computer function and interconnection (II): interconnection structure, bus interconnection, PCI.
5	Cache memory: computer memory system, cache memory principles, elements of cache design.
6	Internal memory: semiconductor main memory, error correction, DRAM organization.
7	Input / Output(I) : external devices , I/O modules , programmed I/O.
8	Input / Output(II) : DMA , I/O channel and processors
9	Computer architecture: arithmetic and logic unit , integer arithmetic floating point representation , floating point arithmetic
10	Instruction-Level Parallelism and Superscalar Processors Overview, Design Issues, Pentium 4
11	Instruction sets: machine instruction, type of operands, data type, and operations addressing modes, instruction formats.
12	Reduced Instruction Set Computers (RISCs), Instruction Execution Characteristics The Use of a Large Register File, Compiler-Based Register Optimization Reduced Instruction Set Architecture, RISC Pipelining MIPS R4000, SPARC, The RISC versus CISC Controversy,
13	CPU structure: processor organization , register organization CPU function : instruction cycle , instruction pipelining
14	Parallel Organization, Parallel Processing, The Use of Multiple Processors, Symmetric Multiprocessors, Cache Coherence and the MESI Protocol, Clusters,
15	Multicore Computers, Hardware Performance Issues, Software Performance Issues, Multicore Organization, Case study Pentium and power PC processor.

Text book	**Text book:** Computer Organization and Architecture: Designing for Performance, **Author :** William Stallings **Edition & Year public :** 8/E ,Prentice- Hall,2009
Reference	

Course Title	Modem Algebra & Discrete Mathematics	Theoretical hours/w	2
Course Code	ICE312	Practical hours/w	0
Year	Third	Tutorial hours/w	2
Semester	First	Units	2

Course Description

Week No.	Topics
1	Sets and its operations, Functions
2	Groups, Rings, and Fields
3	Propositions, Predicates and Quantifiers
4	Mathematical Reasoning
5	Modular Arithmetic, Recursive Algorithms
6	Computing Inverses
7	Euclid's Algorithm
8	Finite Fields of the form GF(P)
9	Polynomial Arithmetic
10	Finite Field of the form GF(2m)
11	Fermat's and Euler's Theorems
12	Testing for Partiality
13	The Chinese Remainder Theorem
14	Discrete Logarithms
15	Final Exam

Text book	**Text book:** **Author** : Kenneth H. Rosen, "Discrete Mathematics and its Applications",6 th Edition, 2006
Reference	**2-** William Stalling, "Cryptography and Network Security; Principles and Practice",4th edition**,2006**

Course Title	Engineering Analysis (signal + numerical)	**Theoretical hours/w**	**3**
Course Code	ICE313	**Practical hours/w**	**3**
Year	Third	**Tutorial hours/w**	**1**
Semester	First	**Units**	**4**

Course Description

Week No.	Topics
1	Introduction to signals and systems; Examples of some signals & systems. Why it is important to study signals and systems. -Classification of signals; Continuous & discrete time signals, Deterministic and random signals, Periodic and non- periodic signals, Even and odd signals, Time & and frequency domain signals. -Elementary signals; Sinusoidal, Complex exponential, Rectangular, Triangular, Unit impulse, Unit step, Damped sinusoidal.
2	Signal operations: Amplitude scaling, Amplitude shift, Multiplication, Addition/ Subtraction, Integration, Differentiation, of signal.
3	-Time shifting, Folding or reversing, Scaling of signals, Mixed operations. -Convolution; Convolution integral, Evaluation of convolution, Convolution of Of discrete time signals, Input/ output relations of systems.
4	System properties and representation: -linearity, time invariance, memory, Causality, stability, parallel and cascade systems, Feed forward and feedback systems, Recursive and non-recursive systems
5	LTI systems: -impulse response and unit step response of LTI systems. -Differential equation representation of systems.
6	Examples of practical systems; ideal and practical Low pass filters,Integrator, Moving Average system, Multipath communication channel. Filtering of signals. -types of filters (LPF, HPF, BPF, & BSF). -ideal magnitude and phase responses. Butterworth, Chypescheve, Elliptic filters -representation and design of filters using Laplace transform.
7	Filtering of signals; Design steps of filters. Design examples of LPF and HPF filters
8	Introduction to numerical methods; Absolute and relative errors, Rounding and chopping, Computer errors in representing numbers. Review of Taylor series and some useful mathematical relations.
9	Roots of equations: - Graphical methods, Bisection methods, Newton method. - Secant method, Systems of nonlinear equation.
10	Systems of linear equations: - Gaussian elimination. - Gauss-Jordan method.

11	Methods of least squares: - Linear regression. - Polynomial regression. - Multiple linear regression.
12	Interpolation: - Newton's Divided difference method. - Lagrange interpolation. - Inverse interpolation.
13	Numerical integration: - Trapezoid rule. - Simpson's rules. - Romberg algorithm.
14	Numerical Differentiation: - Estimating derivatives. - Richardson extrapolation.
15	Ordinary differential equations: - Euler's method. - Runge - Kutta methods. Methods for systems of equations: - Adaptive RK metods. - Multistep metods. - Boundary value problems.
Text book	**Text Book:** Signals & systems **Author:** Simon Haykin **Edition & year published:** John Wiley & sons, 2nd Ed., 2003
Reference	**Title:** Numerical methods for Engineers **Author :** Steven C. Chapra and Raymond p. Canal **Edition & Year Public:** 5th Edition

Course Title	Distributed Database	Theoretical hours/w	2
Course Code	ICE314	Practical hours/w	2
Year	Third	Tutorial hours/w	0
Semester	First	Units	3

Course Description

Week No.	Topics
1	*DDBMS Architecture*: definition of DDBMS architecture, ANSI/SPARC standard, global, local, external, and internal schemas
2	DDBMS architectures, components of DDBMS
3	*Distributed Database Design*: conceptual design (what can be distributed, design patterns), top-down, bottom-up patterns, technical design (fragmentation, allocation and replication of fragments, optimality, heuristics)
4	*Semantic Integrity Control*: view management, security control, integrity control
5	*Distributed Query Processing*: overview of query processing and query optimization, query decomposition and data localization
6	*Query decomposition and data localization*: normalization, analysis, elimination of redundancy, rewriting, reduction for HF, reduction for VF
7	*Optimization of Distributed Queries*: basic concepts, distributed cost model, database statistics
8	*Optimization of Distributed Queries*: ordering of joins and semijoins, query optimization algorithms, INGRES, System R, hill climbing
9	*Transactions: introduction to transactions, definition and examples, properties, classification, processing issues, execution*
10	*Concurrency Control*: definition, execution schedules, examples.
11	locking based algorithms.
12	Timestamp ordering algorithms, deadlock management.
13	*Reliability*: definitions, basic concepts, local recovery management
14	Distributed reliability protocols
15	*Reliability*: distributed reliability protocols, 2PC protocol

Text book	**Text book :** Principles of Distributed Database Systems, **Author :** M. Tamer Oezsu, Patrick Valduriez **Edition & Year public :** 2nd Edition, 2000
Reference	

Course Title	Distributed Database Lab	Theoretical hours/w	2
Course Code	ICE314	Practical hours/w	2
Year	Third	Tutorial hours/w	0
Semester	First	Units	3

Lab Description

Week No.	Topics
1	Creating Tables and Queries using MSQL I
2	Creating Tables and Queries using MSQL II
3	Creating Forms and Reports using MSQL I
4	Creating Forms and Reports using MSQL II
5	Generating Switchboard, Menus and Modules using Access and VB
6	Introduction to Case tool (System Architect)
7	Creating Entity Relationship Diagram ERD using CASE tool
8	Normalization in Access
9	Web DB I
10	Web DB II
11	Advanced queries using SQL Server
12	Continue of Advanced queries using SQL Server
13	Work on the team project
14	Work on the team project
15	Final Examination

Text book	
Reference	

Course title	Human Rights	**Theoretical hours/w**	**1**
Course Code	UR321	**Practical hours/w**	**0**
Year	Third	**Tutorial hours/w**	**0**
Semester	Second	**Units**	**1**

Course Description

Topics	Week No.
حقوق الانسان في الحضارات القديمة: حقوق الانسان في الحضارات اليونانية والمصرية	**1**
حقوق الانسان في حضارات العراق القديمة	**2**
حقوق الانسان في الشرائع والاديان السماوية: في الديانة اليهودية والمسيحية،	**3**
في الاسلام	**4**
مصادر حقوق الانسان: المصادر الدولية ، المصادر الوطنية ،	**5**
دستور جمهورية العراق	**6**
ضمانات حقوق الانسان: على الصعيد الداخلي، على الصعيد الدولي،	**7**
حقوق الانسان في الاسلام	**8**
دور المنظمات الاقليمية في حماية حقوق الانسان: اتفاقية الاوربية، الاتفاقية الامريكية،	**9**
الميثاق الافريقي، الميثاق العربي	**10**
مستقبل حقوق الانسان: التقدم التكنولوجي واثره على الحقوق والحريات،	**11**
العولمة وحقوق الانسان	**12**
نشاة وتطور حقوق الطفل: مدلول الطفل، التطور التاريخي لحقوق الطفل، لدى الامم والحضارات، لدى الديانة المسيحية	**13**
حقوق الطفل في الاسلام	**14**
حقوق الطفل في الاتفاقية الدولية لعام ١٩٨٩	**15**

Text book	**المصدر:** حقوق الانسان والطفل والديمقراطية **المؤلف:** أ. د. ماهر صالح علاوي الجبوري واخرون **الناشر وسنة الطبع:** وزارة التعليم العالي والبحث العلمي– جامعة تكريت، ٢٠٠٩
Reference	

Course Title	Operating Systems	Theoretical hours/w	3
Course Code	CR321	Practical hours/w	2
Year	Third	Tutorial hours/w	1
Semester	Second	units	4

Course Description

Week No.	Topics
1	Introduction to operating system(functions and types), User View, System View, Defining Operating Systems, System Goals, Mainframe Systems, Desktop Systems, Multiprocessor Systems, Distributed Systems, Real-Time Systems, Handheld Systems
2	Operating-System Structures, Operating System Components, Operating-System Services
3	Operating-System Structures System Calls, Operating System Structure, Virtual Machines, Java, system design & implementation
4	Processes: Process Concept, Threads, Process Scheduling, Context Switch
5	Processes, Operations on Processes, Cooperating Processes, Interprocess Communication, Communication in Client-Server Systems
6	Threads, Overview, Multithreading Models, Threading Issues
7	Cpu Scheduling, Basic Concepts, Scheduling Criteria, Scheduling Algorithms
8	Cpu Scheduling, Thread Scheduling
9	Process Synchronization, Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Deadlocks and Starvation, Classical Synchronization Problems Monitors, Atomic Transactions
10	Deadlocks, System Model, Deadlock Characterization, Methods for Handling Deadlocks Deadlock Prevention
11	Deadlocks, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock
12	Memory Management, Background, Swapping, Contiguous-Memory Allocation
13	Memory Management, Paging
14	Memory Management, Segmentation, Segmentation with Paging
15	Examination
Textbook	Text book: Operating system concepts Author: Abraham Silberschatz, Peter B. Galvin , Greg Gagne Edition & year public: 8th edition, Addison-Wesely, 2008
References	

Course Title	Operating Systems Lab	Theoretical hours/w	3
Course Code	CR321	Practical hours/w	2
Year	Third	Tutorial hours/w	1
Semester	Second	Units	4

Lab Description

Week	Topics
1.	Unit 1: Overview of Linux: Characteristics, and Installation • Create a dual-boot environment with Linux and Microsoft Windows.
2.	Unit 2: The Linux Desktop: Graphical User Interfaces Objectives • Use the components and features of the GNOME desktop environment. • GUIs available for Linux
3.	Unit 3: Command-Line Interface Basics • Perform basic tasks by using the command-line interface (CLI). • Using Linux Command-Line Basics • Using vi/vim text editor, Using Permissions and Links
4.	Unit 4: Process Management and bash Configuration • Use the various Linux process management features. • Manage standard input, output, and error. • View and manage process listings and background jobs. • Configure Bourne Again Shell (bash) startup files and aliases.
5.	Unit 5: Scripting and Programming with Linux Objectives • Create and execute basic programs by using the C programming language and Bourne Again Shell (bash). • Compile a simple C program by using gcc. • Control the script flow by using if...then, select, statements. • Control the script flow by using the for loop, while loop.
6.	Unit 6 : system call Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
7.	Unit 7 : using I/O system call Write programs using the I/O system calls of UNIX OS (open, read, write, etc)
8.	Unit 8: Write C programs to simulate UNIX commands like ls, grep, etc.
9.	Unit 9 : CPU scheduler algorithms Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart and compute and print the average waiting time and average turnaround time For each of the scheduling policies • FCFS, SJF. • Priority, Round robin.
10.	Unit 10 : Implement some memory management schemes • Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. • Each memory request consists of the process-id and the amount of storage space required in bytes. • Allocated memory space is maintained as a linked list of nodes When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space • Merge contiguous free blocks into one single block. • For allocation use first fit, worst fit and best fit.

11.	Unit 11: Peripheral Hardware Configuration Objectives • Configure computer hardware in Linux. • Configure a printer with Common UNIX Printing System (CUPS). • Configure a network interface card (NIC).
12.	Unit 12: Basic Linux Administration and Maintenance Objectives • Administer and maintain a Linux system. • Create users and groups by using the CLI and GUI tools. • Install and update Linux software with the yum, rpm, and pirut tools. • Back up a Linux system by using the tar utility. • Maintain effective logs by using the log rotate utility.
13.	Unit 13: Linux Network Services Objectives • Access Linux network services from a Linux client system. • Troubleshoot network problems with standard TCP/IP utilities. • Connect to secure services by using the OpenSSH tools. • Transfer files across a network by using FTP.
14.	Unit 14: Basic Apache Configuration Objectives • Configure basic settings on an Apache Web server. • Identify the core elements of a Fedora Apache installation. • Configure the Apache Web server by editing the httpd.conf file. • Configure the Apache Web server by using the system-config-httpd • configuration script.
15.	Unit 15: Basic Apache Management and Troubleshooting Objectives • Manage and troubleshoot an Apache Web server. • Configure logging options in the httpd.conf file. • Configure file and directory security in the httpd.conf file. • Troubleshoot Apache from the command line and logs.
Text book	**Text book**: *Practical Guide to Fedora and Red Hat® Enterprise Linux®*
Reference	**Author :** Sobell, Mark G. **Edition & Year public** : Pearson Prentice Hall, 2008

Course Title	Cryptography	Theoretical hours/w	2
Course Code	CR322	Practical hours/w	3
Year	Third	Tutorial hours/w	1
Semester	Second	Units	3

Description Course

Week No.	Topics
1	Introduction: Security Services, Mechanisms & Attacks
2	Classical Encryption Techniques: Symmetric Cipher Model
3	Substitution Techniques, Transposition Techniques
4	Rotor Machines, Steganography
5	Block Ciphers and DES: Simplified DES
6	Advance Encryption Standards; AES
7	Block Cipher Modes of Operation
8	Stream Cipher Principles
9	Public Key Cryptography
10	RSA Algorithm
11	Key Management
12	Diffie- Hellman Key Exchange
13	Elliptic Curve Cryptography
14	Digital signature
15	Digital Signature Standard, DSS
16	Final
Text book	**Text book:** Cryptography and Network Security; Principles and Practice **Author :**William Stallings **Edition & Year published :** 4th Edition, 2006
Reference	

Course Title	Digital Communications	Theoretical hours/w	3
Course Code	ICE323	Practical hours/w	3
Year	Third	Tutorial hours/w	0
Semester	Second	Units	4

Course Description

No.	Topics
1	Analog-to-Digital Conversion: Pulse modulation techniques, sampling, time division multiplexing, pulse amplitude modulation, pulse width modulation, pulse position modulation.
2	Digital Modulation Techniques: Pulse code modulation, differential pulse code modulation, delta modulation, adaptive delta modulation.
3	Continuously variable slope delta modulation, Noise in pulse-code modulation systems, noise in delta-modulation systems.
4	Binary phase-shift keying, differential phase-shift keying, differentially encoded PSK DEPSK, quadrature phase-shift keying QPSK, M-ary PSK.
5	Quadrature amplitude shift keying QASK, binary frequency shift keying, similarity of BFSK & BPSK, M-ary FSK, minimum shift keying MSK, Duo-binary encoding.
6	Source of noise, frequency representation of noise, effect of filtering on probability density of Gaussian noise, spectral components of noise, response of a narrow band filter to noise.
7	Effect of a filter on power spectral density of noise, superposition of noises, mixing involving noise, linear filtering, noise bandwidth, quadrature components of noise.
8	Power spectral density of n(t) & n(t), probability density of n(t), n(t), and their time derivatives, representation of noise using orthonormal coordinates, Irrelevant noise components.
9	Data transmission, base band signal receiver, probability of error, optimum filter.
10	White noise: the matched filter, probability of error of the matched filter.
11	Coherent reception: correlation, phase-shift keying, frequency shift keying, non-coherent detection of FSK, differential PSK, four phase PSK (QPSK).
12	Error probability for QPSK, probability of error of minimum shift keying MSK, comparison of modulation systems.
13	Spread Spectrum Modulation: direct sequence (DS) spread spectrum, use of spread spectrum with code division.
14	Multiple access CDMA, ranging using DS spread spectrum, frequency hopping (FH) spread spectrum.
15	Generation & ch/s of PN sequences, acquisition (coarse synchronization) of a FH signal, tracking (fine synchronization) of a FH signal, acquisition of a DS signal, tracking of a DS signal.

Text book	**Text book(1):**Analog&digital communication systems **Author :** Martin S. Roden
Reference	**Text book(2) :** Principles of Communications **Author :** Taub & Schilling

Course Title	Digital Communication Lab	**Theoretical hours/w**	**3**
Course Code	ICE323	**Practical hours/w**	**3**
Year	Third	**Tutorial hours/w**	**0**
Semester	Second	**Units**	**4**

Lab Description

Week No.	Topics
1	Sample the given input signal for different sampling rates and recover the signal by means of appropriate low – pass filter..
2	Study the Pulse – Width Modulation for both AC and DC Modulating Signals and obtain the corresponding waveforms
3	Study the Pulse – Position Modulation for both AC and DC Modulating Signals and obtain the corresponding waveforms
4	Study the functioning of a given Analog to Digital Converter
5	Study the functioning of a given Digital to Analog Converter
6	Encode the given 4-Bit Data Word into 16-Bit Orthogonal Encoded Word using Hadamard Code.
7	Decode the 16-Bit Orthogonal Encoded Word to 4-Bit Data Word.
8	Study the performance of the given Continuously Variable Slope Delta Modulation (CVSD).
9	Obtain the characteristics of the Phase Shift Keying (PSK) Modulator.
10	Obtain the characteristics of the Frequency Shift Keying (FSK) Modulator

Text book	**Text book :** **Author :** **Edition & Year public :**
Reference	

Course Title	Image Processing	Theoretical Hrs. per week	2
Course Code	ICE324	Applied Hrs. per week	3
Year	Third	Tutorial Hrs. per week	1
Semester	Second	Units	3

Course Description

No.	Topics
1	**Introduction**: Digital Image Processing and application- Image representation and modeling- Image Enhancement- Image Restoration- Image Analysis- Image Data Compression.
2	**Digital Image Fundamentals**: A simple Image Model- Some Basic Relationship Between Pixels
3	**Image Transforms**: Two-Dimensional Fourier series representation
4	**Image Transforms**: Two-Dimensional Filter design
5	Image histogram, histogram modification
6	Image noise, noise cleaning
7	Image enhancement by pixel point operation
8	Image enhancement by group of pixel operation, Linear special domain image filter
9	Image enhancement by group of pixel operation, Non-Linear special domain image filter
10	Image segmentation and extraction
11	Image Compression Basic Algorithms
12	Binary image thinning, skeletonizing, and thickening
13	Binary image generalized dilation and erosion, Binary image close and open operations
14	**Object Recognition**: Pattern and pattern classes- Application of Pattern Recognition –Multiple Features Conditionality Independent Features- Decision Boundaries- Estimate Error Rate
15	**Artificial Neural Network**: Introduction- Nets with & without Hidden Layers- The Back Propagation Algorithms- Hopfield Nets.

Text book	**Title :** Digital Image Processing **Author :** Rafael C. Gonzalez, Richard E. Woods **Edition & Year public:** 3rd edition, 2008.
Reference	**Title :**Pattern Recog.& Image Analysis **Author:** Earl G., Richard J., and Steve J. **Author:** Earl G., Richard J., and Steve J.**Author :** Taub & Schilling

Course title	Image Processing Lab	Theoretical hours/w	2
Course Code	ICE324	Practical hours/w	3
Year	Third	Tutorial hours/w	1
Semester	Second	Units	3

Lab Description

Week No.	Topics
1	Two Dimensional Image Processing System
2	Image Formats
3	Two Dimensional Fourier Series Response
4	Two Dimensional Filter Design
5	Image Noise, Noise Clearing
6	Image Histogram
7	Linear Spatial Filter
8	Nonlinear Spatial Filter
9	Enhancement By Point Processing
10	Image Segmentation
11	Image Compression
12	Morphological Image Processing
13	Pattern Recognition
14	**Final Exam**

Text book	**Text book :** **Author :** **Edition & Year public :**
Reference	

Course title	Information Systems	**Theoretical hours/w**	**3**
Course Code	ICE325	**Practical hours/w**	**0**
Year	Third	**Tutorial hours/w**	**0**
Semester	Second	**Units**	**3**

Course Description

Week No.	Topics
1	Information Systems in Global Business Today: the role of information systems in business today, how information systems are transforming business
2	Globalization Challenges and Opportunities: the emerging digital firm
3	Globalization Challenges and Opportunities: Strategic Business Objectives of Information Systems
4	Perspectives on information systems: what is an information system?, dimensions of information systems
5	Global E-Business and Collaboration: Business Processes, How Information Technology Improves Business Processes
6	Global E-Business and Collaboration: Types of Information Systems (TPS, MIS, DSS, and Business Intelligence)
7	Foundations of Business Intelligence: Databases and Information Management: Organizing Data in A traditional File Environment, The Database Approach to Data Management
8	IT Infrastructure and Emerging Technologies: IT Infrastructure, Infrastructure Components
9	System analysis and design: need for system analysis, system analysis of existing, new requirement
10	System analysis and design: system development model, structured systems analysis and design
11	E-commerce: Digital Markets, Digital Goods: E-commerce and the Internet, E-commerce : Business and Technology
12	Securing Information Systems
13	Telecommunications, the Internet, and Wireless Technology
14	Enhancing Decision Making: Decision Making and Information Systems, Business Intelligence in the Enterprise
15	Building Information Systems: systems development and organizational change

Text book	**title**: Management Information Systems Author: K. C. Laudon & J.P.Laudon Edition & Year public: Prentice Hall, 12th Ed, 2012.
References	**title**: Information Systems: A manager's guide to technology Author: Gallaugher, J Edition & Year public: 1.4 Ed, 2012 **title**: Information Systems Author: Ralph Stair, George Reynolds Edition & Year public: 9 Ed, 2010 **title**: Information Systems Essentials Author: Ralph Stair, George Reynolds Edition & Year public: 6 Ed, 2012

Fourth Year

Course Title	Democracy	Theoretical Hrs/w	1
Course Code	UR411	Applied Hrs/w	0
Year	Fourth	Tutorial Hrs/w	0
Semester	First	Units	1

Topics	Week No.
مفهوم الديمقراطية: جذور مفهوم الديمقراطية وتطوره	1
تعريف الديمقراطية	2
الديمقراطية العالمية والخصوصية	3
اشكال الديمقراطية الديمقراطية المباشرة	4
الديمقراطية شبه المباشرة	5
الديمقراطية التمثيلية (النيابية)	6
المجلس النيابي	7
الية النظام التمثيلي (النيابي) : الانتخاب مفهوم الانتخاب وتكييفه القانوني	8
هيئة الناخبين	9
تنظيم عملية الانتخاب، الدوائر الانتخابية، القوائم الانتخابية	10
المرشحون، الحملة الانتخابية، التصويت	11
نظم الانتخابات الانتخاب المباشر وغير المباشر ، الانتخاب الفردي والانتخاب بالقائمة	12
نظام الاغلبية، نظام تمثيل المصالح،	13
نظام التصويت الاختياري والتصويت الاجباري،	14
نظام التصويت السري والتصويت العلني	15

Lecturer Name: **Signature:**	**المصدر:** حقوق الانسان والطفل والديمقراطية **المؤلف:** أ. د. ماهر صالح علاوي الجبوري واخرون **الناشر وسنة الطبع:** وزارة التعليم العالي والبحث العلمي– جامعة تكريت، ٢٠٠٩

Course Title	Digital Signal Processing	Theoretical Hrs/w	3
Course Code	CR411	Applied Hrs/w	3
Year	Fourth	Tutorial Hrs/w	1
Semester	First	Units	4

Course Description

Week No.	Topics
1	**Signals, Systems and signal processing** Basic element of digital signal processing, Advantages of digital over analog signal processing, Classification of Signals
2	**The Concept of frequency in Continuous and Discrete – time signals** Continuous – time sinusoidal signals, Discrete – time sinusoidal signals, Harmonically related complex exponential.
3	**Analog –to-digital and digital-to-analog conversions** Sampling of analog signals, The sampling theorem, Quantization and conversion, Digital-to-analog conversion, Analog-to-digital conversion.
4	**Analysis of digital signals and systems**.
5	**Convolution and deconvolution in discrete time systems**
6	**Discrete-time systems** Input/output description of systems, Block diagram representation of discrete-time systems, Classification of discrete-time system, Correlation of discrete-time signals, Properties of correlation.
7	**Time domain to frequency domain conversion** Discrete-Fourier transform, Fast-Fourier transform
8	**Discrete Cosine Transform**
9	**The Z-transform** Direct Z-transform, Inverse Z-transform, Properties of the Z-transform.
10	**Analogue Filtering versus Digital filtering**
11	**FIR Filters**
12	**Design methods of FIR Filters**
13	**IIR filters**
14	**Design Methods of IIR Filters**
15	**Adaptive Digital Filters**

Text book	**Title :** Digital Signal Processing , A practical approach **Author :** John G.Proakis **Edition/Publisher:** Macmillan Publishing Company , 4th 2006
Reference	**Title :** Digital Signal Processing fundamentals ; **Author:** Vigay K. Madisetti **Edition & Year public :** 2nd Ed., CRC press, 2010

Course Title	Digital Signal Processing **Lab**	**Theoretical Hrs/w**	**3**
Course Code	CR411	**Applied Hrs/w**	**3**
Year	Fourth	**Tutorial Hrs/w**	**1**
Semester	First	**Units**	**4**

Lab Description

Week No.	Topics
1	Introduction to Matlab
2	Signal Generation Using Matlab
3	Sampling and Quantization
4	Discrete System and Convolution
5	Frequency Analysis -I
6	Frequency Analysis -II
7	Z-Transform - I
8	Z-Transform - II
9	Digital filter - I
10	Digital filter - II
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Text book	**Title :** Digital Signal Processing , A practical approach **Author :** John G.Proakis **Edition/Publisher:** Macmillan Publishing Company , 4th 2006
Reference	**Title :** Digital Signal Processing fundamentals ; **Author:** Vigay K. Madisetti **Edition & Year public :** 2nd Ed., CRC press, 2010

Course Title	Wireless Communications	Theoretical Hrs/w	2
Course Code	ICE412	Applied Hrs/w	3
Year	Fourth	Tutorial Hrs/w	0
Semester	First	Units	3

Course Description

Week No.	Topics
1	Introduction to the design, analysis, and fundamental limits of wireless transmission systems & Cellular systems
2	Wireless channel and system models
3	Fading and diversity
4	Resource management and power control
5	Multiple-antenna and MIMO systems
6	Space-time codes and decoding algorithms
7	Multiple-access techniques and multiuser detection
8	Broadcast codes and pre-coding
9	Cellular and ad-hoc network topologies
10	Mobile communications evolution, OFDM and ultra-wideband systems; and architectural issues.
11	Cellular systems
12	Global system for mobile communications (GSM)
13	Radio communication basics
14	Wireless networks
15	Antennas for cellular networks

Text book	**Text book :** Wireless Communications: Principles & Practice **Author :** Theodore S. Rappaport **Edition & Year public :** 2nd Edition, 2003
Reference	

Course Title	Wireless Communications Lab	Theoretical Hrs/w	2
Course Code	ICE412	Applied Hrs/w	3
Year	Fourth	Tutorial Hrs/w	0
Semester	First	Units	3

Lab Description

Week No.	Topics
1	Wireless Systems
2	Cellular Systems
3	Mobile communications
4	Global system GSM
5	Radio communications
6	Wireless networks
7	Antennas in cellular networks
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Text book	**Text book :** Wireless Communications: Principles & Practice **Author :** Theodore S. Rappaport **Edition & Year public :** 2nd Edition, 2003
Reference	

Course Title	Multimedia Computing	Theoretical Hrs/w	2
Course Code	ICE421	Applied Hrs/w	3
Year	Fourth	Tutorial Hrs/w	0
Semester	Second	Units	3

Course Description

Week No.	Topics
1	Introduction to Multimedia, Components of Multimedia
2	Graphics and Image Data Representations: Graphics/Image Data Types, Popular File Formats
3	Color Models in Images, Color Models in Video
4	Fundamental Concepts in Video: Types of Video Signals, Analog Video, Digital Video
5	Basics of Digital Audio: Digitization of Sound, MIDI: Musical Instrument Digital Interface, Quantization and Transmission of Audio
6	Multimedia Data Compression: Lossless Compression Algorithms
7	Multimedia Data Compression: Lossy Compression Algorithms
8	Image Compression Standards: JPEG Standard, JPEG2000 Standard, JPEG-LS Standard, Bilevel Image Compression Standards
9	Basic Video Compression Techniques: Introduction to Video Compression, Search for Motion Vectors
10	MPEG Video Coding
11, 12	Basic Audio Compression Techniques: ADPCM in Speech Coding, G.726 ADPCM, Vocoders, MPEG Audio Compression
13	Introduction to Computing Systems
14	Parallel Computing Technology, Grid and Cloud Computing Tech.
15	Quality of Multimedia Data Transmission

Text book	Title: Fundamentals of Multimedia Author: Ze-Nian and Drew, Mark S. Li Edition & Year public : 2004 Publisher: Pearson Higher Education
Reference	Title: Multimedia Systems Author: Parag Havald& Gerard Medio Edition & Year public : 1st, 2009 Publisher: Course Technology

Course Title	Multimedia Computing Lab	Theoretical Hrs/w	2
Course Code	ICE421	Applied Hrs/w	3
Year	Fourth	Tutorial Hrs/w	0
Semester	Second	Units	3

Lab Description

Week No.	Topics
1	Implement Fundamental Graphics Function
2	Perform 2D Transformations : Translation, Rotation, Scaling, Reflection and Sharing
3	Voice and Audio Digitization and Sampling Rate Conversion
4	Conversion between Color Models
5	Speech and Audio Compression
6	Implement Image Compression Algorithm
7	perform animation using any Animation multimedia authoring tools
8	perform basic operations on image using any image editing software
9	Create a Jpeg image which demonstrates the various features of an image editing tool.
10	Multimedia document authoring (using Macromedia Flash)
11, 12	Video Manipulation and Creating Visual Effects (using Adobe & CS5)

Course Title	Internet Engineering	Theoretical Hrs/w	2
Course Code	ICE422	Applied Hrs/w	2
Year	Fourth	Tutorial Hrs/w	1
Semester	Second	Units	3

Course Description

Week No.	Topics
1	Introduction, Basic Network Concepts, client and server,
2	Network Topologies, Bus, Ring, Star. Cabling Media
3	Basic Network Hardware, Medium Access Control and medium Access Methods
4	LAN Architecture
5	The OSI Model, Description of the 7th Layer System, The physical Layer and data link layer
6	The network layer and IP routing, The transport layer, The session, presentation and Application layer
7	The Cisco three hierarchal model, IP addressing and classes, Idea of sub netting,
8	Introduction to Routing and Routing Techniques, Flooding, Distance vector Routing
9	Link State Routing and Hierarchal Routing, Routing Information Protocol (RIP ver 1), Analysis and Configuration
10	RIP ver2, Differences, how it works and Configuration
11	Interior Gateway Routing Protocol (IGRP) and EIGRP configuration
12	Open Shortest Path First (OSPF)
13	Routing In Wireless and mobile networks
14	Introduction to Congestion and Congestion Control, Quality of Service Techniques
15	Multiplexing and switching networks, IP Networks, ATM networks

Text book	**Title :** IP routing **Author :** Ravi Malhotra **Edition & Year public :** 2002
Reference	**Title :** Advanced wireless networks **Author :** Savo G. Glistic **Edition & Year public :** 2006

Course Title	Internet Engineering Lab	Theoretical Hrs/w	2
Course Code	ICE422	Applied Hrs/w	2
Year	Fourth	Tutorial Hrs/w	1
Semester	Second	Units	3

Lab Description

Week No.	Topics
1	Analysing number of transmitting nodes vs. collision count, mean delay for Ethernet LAN .
2	Analysing bus vs. star-switch with respect to number of collisions (for a fixed number of transmitting nodes) for Ethernet LAN
3	Analysing performance of token ring with number of nodes vs. response time, mean delay using NetSim.
4	Comparing the throughput and normalized throughput for token ring and token bus for different transmitting nodes.
5	Comparing the CSMA/CD vs. CSMA/CA protocols (for a fixed number of transmitting nodes).
6	Analysing the difference between unicast and broadcast transmission (for a fixed number of transmitting nodes).
7	Verification of stop-and-wait protocol.
8	Verification of Go-back-N protocol.
9	Verification of Selective repeat protocol.
10	Verification of distance vector routing algorithm.
11	Verification of link state routing algorithm.
12	Some programming techniques in socket programming.

Text book	**Title :** IP routing **Author :** Ravi Malhotra **Edition & Year public :** 2002
Reference	

Course Title	Data Mining	Theoretical Hrs/w	2
Course Code	ICE414	Applied Hrs/w	0
Year	Fourth	Tutorial Hrs/w	1
Semester	Second	Units	2

Course Description

Week No.	Topics
1	Introduction to Data Warehousing: introduction, evolution of data warehousing, data warehousing concepts, example of typical data warehouse queries, benefits of DW
2	Operational Database Systems and Data Warehouse (OLTP & OLAP), Data Marts, Metadata.
3	Data webhouse, clickstream, OLTP, comparison of OLTP & DW
4	Data warehousing: multidimensional modeling, cubes, facts, dimensions, DW design, Data warehousing: more about dimensions, star scheme, snowflake scheme, DW implementation, DW applications
5	The basic lifecycle of a DW: Analysis and requirements definition, Conceptual design, logical design, implementation
6	Architecture of DW: introduction, typical architecture of DW, typical DW & data mart architecture, reasons for creating a data mart
7	Data warehouse physical design
8	Partioning, indexing, integrity constraints and materialized views
9	Extract-Transform-Load: ETL process, building dimensions and fact tables, extract, transform, load, important criteria in selecting ETL tool.
10	Introduction to Data Mining: Definitions & Motivations, Data to be Mined, Knowledge to be discovered, Techniques Utilized, Applications Adapted, Major Issues in Data Mining
11	Introduction to Data Mining: Definitions & Motivations, Data to be Mined, Knowledge to be discovered, Techniques Utilized, Applications Adapted, Major Issues in Data Mining
12	Data mining approaches and tools(Data Mining Technique): associations, sequences
13	Data mining approaches and tools(Data Mining Technique): classifications, clusters, and forecasts
14	Introduction to Business Intelligence: Business intelligence design and development, BI Trends
15	Intelligent systems techniques for DW & DM, Web Mining

Text book	**Title**: Building the Data Warehouse **Author** : W.H. Inmon, Claudia Imhoff, Ryan Sousa **Edition & Publication year**: 4th Wiley. ISBN: 978-0-7645-9944-6 , October 2005
References	**Title** : The Data Warehouse Toolkit **Author** : Ralph Kimball, Margy Ross **Edition & Publication year**: 2nd *John Wiley & Sons*,January 2008 **Title**: The Data Warehouse Lifecycle Toolkit **Author** : Ralph Kimball, Margy Ross **Edition & Publication year**: 2nd *Wiley*, January 2008 **Title**: The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling **Author** : Ralph Kimball, Margy Ross **Edition & Publication year**: 3rd *Wiley* , July 2013

Elective Courses

Course title	Artificial Intelligence	**Theoretical hours/w**	**3**
Course code		**Practical hours/w**	**2**
Year	Fourth	**Tutorial hours/w**	**0**
Semester		**Units**	**4**

Course Description

Week No.	Topics
1	Artificial Intelligence: Roots & History
2	AI as Representation and search
3	Structures and strategies for state space search
4	Heuristic search
5	Control and implementation of state space search
6	Knowledge Intensive Problem solving
7	Reasoning with uncertain or incomplete information
8	Knowledge representation
9	Languages and programming Techniques for AI
10	Prolog
11	Understanding Natural Language
12	Automated Reasoning
13	Machine Learning : symbol-based
14	Genetic Algorithms
15	Neural Network
16	Final Exam

Text book	**Text book:** Artificial Intelligence structures and strategies for complex problem solving, **Author :** George F. Luger **Edition & Year published :** 6th Edition, 2008.
Reference	

Course title	Artificial Intelligence Lab	Theoretical hours/w	3
Course code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Lab Description

Week No.	Topics
1	-
2	Introducing Prolog + Installing Amzi
3	Facts + simple queries
4	Compound Queries + Built-in predicates
5	Rules + arithmetic
6	Assignment A
7	Assignment A
8	Mid-term Exam
9	Managing Data
10	Data structures
11	Operators
12	Assignment B
13	Assignment B
14	Control structure
15	Revision
16	

Text book	**Text book: Amzi! Eclips Interactive Development Environment (IDE) For prolog** **Edition & Year published :** 2007
Reference	

Course title	Control engineering	Theoretical hours/w	3
Course code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Course Description

Week No.	Topics
1,2	Introduction to control systems • Open loop control system • Closed loop control system • Design of control systems
3,4,5	Mathematical Background and Modeling of Dynamic Systems • Differential Equation of Physical Systems • Linear Approximation of Physical Systems • Laplace Transform / Inverse Laplace Transformation • The Transfer Function of Linear Systems • Electrical System / Mechanical System / Analogous between Electrical and mechanical System • DC Motor (Derivation of Mathematical model and Transfer Function)
6	Block Diagram Models • Block Diagram Reduction • Mason's Signal Flow Graph Models
7,8,9	Characteristics and Performance of Feedback Control System • Test Input Signals • Performance of a First-Order System • Performance of a Second-Order System • The S-plane Root Location and the Transient Response • Sensitivity of Control systems to parameter Variations • Disturbance Signals in Feedback Control System • Steady State Error
10,11	The Stability of Linear feedback Systems • The concept of Stability • The Routh-Hurwitz Stability Criterion • The relative Stability of Feedback Control Systems
12,13	The Root Locus Method • The Root locus Concept • The Root Locus Procedure (Rules for Constructing Root Loci) • Special Cases • Root Locus Analysis Of Control Systems
14,15	Frequency Response Methods • Bode Diagrams • Polar Plots • Nichols chart • Nyquist Criterion

Text book	**Text book:** Modern Control Systems **Author :** Richard C. Dorf & Robert H. Bishop **Edition & Year public :** Addison-Wesley, 1998.
Reference	Katsuhiko Ogata ,Modern Control Engineering, Prentise-Hall International, 5th , 2009

Course title	Control Engineering Lab	Theoretical hours/w	3
Course code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Lab Description

Week No.	Topics
1	Control systems simulation using MATLAB and SIMULINK control tools
2	Mathematical modeling of physical systems • Linear Approximation of Physical Systems • The Transfer Function of Linear Systems • Electrical System • DC Motor (Derivation of Mathematical model and Transfer Function) Using armature and field control
3	Block Diagram Models • Block Diagram Reduction • Mason's Signal Flow Graph Models
4,5	Characteristics and Performance of Feedback Control System • Performance of a First-Order System and Second-Order System • The S-plane Root Location and the Transient Response • Sensitivity of Control systems to parameter Variations • Steady State Error • Determine time domain response of first order and second order system for step input for various values of constant "k" and obtain performance parameters
6	Different representation method of transfer function • Convert transfer function of a system from (poles and zeros) to (state space) form and vice-versa
7	The Stability of Linear feedback Systems • The Routh-Hurwitz Stability Criterion • The relative Stability of Feedback Control Systems
8,9	The Root Locus Method • The Root Locus Procedure (Rules for Constructing Root Loci) • Root Locus Analysis Of Control Systems • To plot root locus diagram and determine range of a gain "k" for stability
10	Frequency Response Methods • Bode Diagrams • Polar Plots
11	Conventional Controller design • Study P, PI and PID controller and parameter selections and • compare their performance
12	Realization of basic compensators • cascade compensation in time domain and frequency domain and feedback compensation – design of lag, lead, lag-lead compensator using Bode plot and Root locus
13	Digital control systems: • Introduction, sampled data systems, stability analysis in Z-domain
14,15	Fuzzy control: • Fuzzy sets and linguistic variables, The fuzzy control scheme, Fuzzification and defuzzufication methods,

Course title	Information Security	Theoretical hours/w	3
Course code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Course Description

Week No.	Topics
1	Principles of information security
2	Symmetric encryption techniques
3	Data encryption standard (DES)
4	Block ciphers
5	Advanced encryption standard (AES)
6	Symmetric ciphers
7	Confidentiality using symmetric encryption
8	Public Key cryptography
9	Public key cryptosystems
10	Authentication
11	Hash functions & Algorithms
12	Digital signatures
13	Intruders
14	Malicious software
15	Firewalls

Text book	**Title :** Cryptography & Network Security Principles & Practice **Author :** William Stallings **Edition & Year public :** 3rd Edition, 2003
Reference	

Course title	Information Security Lab	Theoretical hours/w	3
Course code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Lab Description

Week No.	Topics
1	Symmetric encryption techniques
2	Data encryption standard (DES)
3	Block ciphers
4	Advanced encryption standard (AES)
5	Symmetric ciphers
6	Confidentiality using symmetric encryption
7	Public Key cryptography
8	Public key cryptosystems
9	Authentication
10	Hash functions & Algorithms
11	Digital signatures
12	Intruders
13	Malicious software
14	Firewalls
15	Final Examination

Text book	**Text book :** Cryptography & Network Security Principles & Practice **Author :** William Stallings **Edition & Year public :** 3rd Edition, 2003
Reference	

Course Title	Advanced Operating Systems	Theoretical hours/w	3
Course Code		Practical hours/w	2
Year	Four	Tutorial hours/w	0
Semester		Units	4

Course Description

Week No.	Topics
1	Threads, SMP&Microkernels:Processes&Threads(Multithreading,thread Functionality, User-Level&Kernel-Level Threads), Symmetric Multiprocessing(SMP Architecture, SMP Organization,Multiprocessor Operating System DesignConsiderations), Micro-kernels(Microkernel Architecture, Benefits of a Microkernel Organization, Microkernel Performance, Microkernel Design), Solaries Thread &SMP Management (Multithreaded Architecture, Motivation, Process Structure, Thread Execution, Interrupts as Threads), Linux Process and Thread Management (Linux Tasks, Linux Threads).
2	Process Synchronization: The Critical-Section Problem, Synchronization Hardware, Semaphores, Deadlocks and Starvation, Classical Synchronization Problems, Monitors, Atomic Transactions
3	DEADLOCKS: Deadlock Characterization (Necessary Conditions, Resource-Allocation Graph), Methods for Handling Deadlocks, Deadlock Prevention (Mutual Exclusion, Hold&Wait, No Preemption,Circular Wait),Deadlock Avoidance (Safe State, Resource-Allocation-Graph Algorithm),Deadlock Detection (Single Instance of Resource, Several Instances of a Resource Type), Recovery from Deadlock (Process Termination, Resource Preemption)
4	EMBEDDED OPERATING SYSTEMS: Embedded Systems, Characteristics of Embedded Operating Systems (Adapting an Existing Commercial Operating System, Purpose-Built Embedded Operating System, eCos (Configurability, eCos Components, eCos Scheduler, eCos Thread Synchronization), TinyOS (Wireless Sensor Networks, TinyOS Goals, TinyOS Components, TinyOS Scheduler, Example Configuration, TinyOS Resource Interface)
5	Real time operating system, Network operating system, Mobile operating system
6	Multimedia operating systems: Introduction to multimedia files(Audio Encoding, Video Encoding), Video compression (JPEG , The MPEG), Multimedia process scheduling (Scheduling Homogeneous Processes , General Real-Time Scheduling, Rate Monotonic Scheduling, Earliest Deadline First Scheduling)
7	Multimedia operating systems : multimedia files system paradiagms (VCR Control Functions, Near Video on Demand, Near Video on Demand with VCR Functions), File placement (Placing a File on a Single Disk, Two Alternative File Organization Strategies, Placing Files for Near Video on Demand, Placing Multiple Files on a Single Disk, Placing Files on Multiple Disks), Caching(Block Caching, File Caching), Disk scheduling for multimedia (Static Disk Scheduling, Dynamic Disk Scheduling)
8	Multimedia processor systems: Multiprocessors, Multiprocessor Hardware (UMA Bus-Based SMP Architectures, UMA Multiprocessors Using Crossbar Switches, UMA Multiprocessors Using Multistage Switching Networks, NUMA Multiprocessors), Multiprocessor Operating System Types, Master-Slave Multiprocessors, Symmetric Multiprocessors, Multiprocessor Synchronization (Spinning versus Switching), Multiprocessor Scheduling (Timesharing , Space Sharing, Gang Scheduling)
9	Multiple processor systems: Multicomputers, Multicomputer Hardware (Interconnection Technology, Network Interfaces), Low-Level Communication Software (Node to Network Interface Communication) , User-Level Communication Software (Send and Receive, Blocking versus Non-blocking Calls), Remote Procedure Call (Implementation Issues), Distributed Shared Memory (Replication, False Sharing, Achieving Sequential Consistency), Multicomputer Scheduling, Load Balancing (A Graph-Theoretic Deterministic Algorithm, A Sender-Initiated Distributed Heuristic

	Algorithm)
10	Distributed systems: Network Hardware(Ethernet, The Internet), Network Services and Protocols (Network Services, Network Protocols), Document-Based Middleware, File System-Based Middleware (Transfer Model, Directory Hierarchy,Naming transparency, Semantics of File Sharing,AFS),Shared Object-Based Middleware, Coordination-Based Middleware
11	Security: Security environment(Threats, Intruders, Accidental Data Loss), Basics of Cryptography(Secret-Key & Public-Key Cryptography, One-Way Functions, Digital Signatures), User authentication(Authentication Using Passwords, How Crackers Break In, UNIX ,Password Security, Improving Password Security, One-Time Passwords, Challenge-Response Authentication), Authentication Using a Physical Object, Authentication Using Biometrics, Countermeasures
12	Attacks from inside the system: Trojan Horses, Login Spoofing, Logic Bombs, Trap Doors, Buffer Overflow, Generic Security Attacks, Famous Security Flaws, Famous Security Flaws in UNIX, Design Principles for Security. Attacks from outside the system: Virus Damage Scenarios, How Viruses Work (Companion Viruses, Executable Program Viruses,Memory Resident Viruses,Boot Sector Viruses, Device Driver Viruses, Macro Viruses, Source Code Viruses), How Viruses Spread, Antivirus and Anti-Antivirus Techniques (Virus Scanners, Integrity Checkers, Behavioral Checkers, Virus Avoidance, Recovery from a Virus Attack), The Internet Worm, Mobile Code (Sandboxing, Interpretation, Code signing), Java Security; Protection mechanisms: Protection Domains, Access Control Lists, Capabilities; Trusted systems: Trusted Computing Base, Formal Models of Secure Systems, Multilevel Security (The Bell-La Padula Model, The Biba Model)
13	Distributed processing, client/server & Clusters: Client/Server Computing (What Is Client/Server Computing? Client/ Server Applications, Middleware, Distributed Message Passing (Reliability versus Unreliability, Blocking versus Non-blocking), Remote Procedure Calls (Parameter Passing, Parameter Representation, Client/Server Binding, Synchronous versus Asynchronous, Object-Oriented Mechanisms), Clusters (Cluster Configurations, Operating System Design Issues, Cluster Computer Architecture, Clusters Compared to SMP), Windows Cluster Server, Sun Cluster (Object and Communication Support, Process Management, Networking, Global File System)
14	DISTRIBUTED PROCESS MANAGEMENT: Process Migration (Motivation, Process Migration Mechanisms, Negotiation of Migration, Eviction, Preemptive versus Nonpreemptive Transfers), Distributed Global States (Global States and Distributed Snapshots, The Distributed Snapshot Algorithm), Distributed Mutual Exclusion (Distributed Mutual Exclusion Concepts, Ordering of Events in a Distributed System, Distributed Queue, A Token-Passing Approach), Distributed Deadlock (Deadlock in Resource Allocation,Deadlock in Message Communication)
15	Case study: Unix & Linux: History of Unix(UNICS,MINIX, Linux),Unix Goals, Interfaces to Unix, Unix Shell, Unix Utility Programs, Kernel Structure, Processes in Unix, Process Management System Calls in UNIX, Thread Management System Calls, Threads in Unix, Threads in Linux, Scheduling in Unix, Scheduling in Linux, Booting Unix; Memory management in Unix: Memory Management System Calls in UNIX , Implementation of Memory Management in UNIX, Paging in UNIX, Page Replacement Algorithm, Memory Management in Linux, Input/Output System Calls in Unix, Implementation of Input/output in Unix, Streams, Unix File System, Linux File System, NFS: Network File System, NFS Architecture , NFS Protocols , SECURITY IN UNIX
Text book	**Title:** Modern Operating System, Andrew S. Tanenbaum, 2nd Ed.,
Reference	**Title :** Operating Systems: Internals and Design Principles, William Stallings, 6th Ed., 2009

Course Title	Network management &security	Theoretical hours/w	3
Course Code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Course Description

Week No.	Topics
1	Network Management Architectures & Applications Management Standards and Models
2,3	Network Management Functions, Configuration Management & Auto-discovery, Configuration Database & Reports, Abstract Syntax Notation One (ASN.1)
4	SNMP v1: Structure of Management Information, Std. Management Information Base (MIBs), SNMPv1 Protocol
5	Network Management Functions, Fault Management, Fault Identification and Isolation, Event Correlation Techniques
6	SNMP v2: Version 2 Protocol Specification, Version 2 MIB Enhancements, MIB-II, Case Diagrams
7,8	Network Management Functions, Security Management Protecting Sensitive Information, Host and User Authentication Key Management
9	SNMP v3: Version 3 Protocol & MIB
10	Network Architecture; Security Principles & Review of cryptography concepts, algorithms, and security services.
11	Authentication Protocols & Public Key Infrastructures (PKI) & Access Controls
12	Web Security; Wireless Security
13	Secret communication & Domain Name System
14	Server Security, Web Browser & client Security
15	E-Mail, Wireless Security

Text book	**Title :** Network Security Bible **Author :** Cole **Edition & Year public :** 2005
Reference	

Course Title	Network management &security Lab	Theoretical hours/w	3
Course Code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Lab Description

Week No.	Topics
1,2	Network Installation a) install the provided network adapter cards in the Insight and the Infomatics PCS b) connect the three computers using the cables, terminators and Ts provided. c) install the correct drivers for the two network adapter cards from the disk(s) provided d) ensure that the Windows for Workgroups network is setup for the three computers e) move the file NET-MAN.FIL from the 486 tower computer to the two PCS that you have connected to it using the installed network.
3,4	Designing a Computer Lab • type of software needed • operating system / network operating system • type of computers (processor, RAM, hardisk size, monitor & video card, additional internal hardware) • type of network (topology & protocol) • other hardware / software needed for the lab • approximate costs for above
5	1) Develop a computer network plan for Luna. (2-3 people) 2) Assign Legion Park Elementary School in writing an educational grant for network equipment that will provide Internet connectivity. I have grant proposal documents from CISCO and ASSANTE' that can be used. (1 person) 3) Same as #2 for another elementary school of your choice (1 person) 4) Same as #2 but for all elementary schools in one of the two districts (2-3 persons)
6	Introduction to Windows NT

Text book	**title:** Network Security Bible **Author :** Cole **Edition & Year public :** 2005
Reference	

Course Title	Networks & Comm. Protocols	Theoretical hours/w	3
Course Code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Course Description

Week No.	Topics
1	Network Models and Network Architectures, Protocol Design Issues, Transmission and Multiplexing
2	Design and Analysis of Link Level Protocols Protocol Functionality, Layering and Framework (SP3)
3	LAN Design, Architectures and Protocols (802.xx) LAN Implementation, Ethernet Switching
4	Internet Protocol (IP) Design, Internet Addressing IETF and the Internet Standards Process
5	WAN Protocols and Network Architecture IP Protocol Implementation, VLANs
6	Internetworking and Routing
7	Transport Layer Protocol Design TCP/UDP Analysis and Implementation
8	Application Protocols: Email, FTP, Telnet and HTTP
9	Network Security (part 1)
10	Network Security (part 2) Wireless Networks
11	Broadband Network Design Issues Internet Backbone Network Architecture
12	IP Telephony and Internet Video H.323 and SIP
13	Network Management Functions and Protocols Network Quality of Service (QoS)
14	Network Models and Network Architectures, Protocol Design Issues, Transmission and Multiplexing
15	Design and Analysis of Link Level Protocols Protocol Functionality, Layering and Framework (SP3)

Text book	**Title :** Internetworking with TCP/IP **Author :** Douglas E. corner **Edition & Year public :** Prentice Hall, 2000
Reference	

Course Title	Networks &Comm. Protoc. Lab	Theoretical hours/w	3
Course Code		Practical hours/w	2
Year	Fourth	Tutorial hours/w	0
Semester		Units	4

Lab Description

Week No.	Topics
1	Network models
2	Network architectures
3	802.XX protocols
4	Internet protocol IP
5	TCP/IP protocol
6	Internetworking & Routing
7	Application protocols
8	Network security
9	IP Telephony & Internet Video H.323 & SIP
10	Network Quality of Service QoS

Text book	Title : Author : Edition & Year public :
Reference	