المناهج الـدراسيـة
فـرع الوسائـط المتـعددة

للعام الدراسي 2023-2024

First Year – First Semester

Code	Title	العنوان	Hours/ Week							
			Lect.	Lab.	Tut.	Exam	SSWL	USSWL	SWL	ESTC
PRFU111	Programming Fundamental	اساسيات البرمجة	4	2	1	5	110	90	200	8.00
MATH112	Mathematics	الرياضيات	4	2	1	5	110	90	200	8.00
STPR113	Statistics and Probability	الاحصاء والاحتمالات	4	0	2	3	93	57	150	6.00
HURD115	Human rights and democracy	حقوق الانسان والديمقراطية	2	0	0	3	33	17	50	2
INTH115	Information Theory	نظرية المعلومات	2	0	2	3	63	37	100	4.00
WORK106	Workshop	المعامل	0	3	0	2	46.5	3.5	50	2.00
Totals			**16**	**7**	**6**	**21**	**468.5**	**294.5**	**750**	**30**

Code	Title	العنوان	Hours/ Week							
			Lect.	Lab.	Tut.	Exam	SSWL	USSWL	SWL	ESTC
STPR121	Structured Programming	البرمجة المهيكلة	4	2	1	5	110	90	200	8.00
DIST122	Discrete Strctures	الهياكل المتقطعة	3	0	1	3	63	62	125	5.00
COLD123	Computer Organization And Logic Design	تركيب الحاسوب والتصميم المنطقي	3	2	1	5	95	55	150	6.00
COTE124	Coding Techniques	تقنيات الترميز	2	0	2	3	63	37	100	4.00
PRDM125	Principles of Digital Media	مبادئ الوسائط الرقمية	2	2	1	5	80	45	125	5.00
WORK106	Workshop	المعامل	0	3	0	2	47	3	50	2.00
Totals			**14**	**9**	**6**	**23**	**457.5**	**292.5**	**750**	**30**

Second Year – First Semester

Code	Title	Lect.	Lab.	Disc.	Units
		Hours/ Week			
CSCL2112	Object Oriented Programming I	2	2	1	3
CSCL2114	Data Structures	2	2	1	3
CSCL2116	Mathematics III	2	2	1	3
CSCL2118	Database Foundation	2	2	1	3
CSCL2120	Baath Party Crimes	2	-	-	2
CSMM2104	Information Theory	2	-	-	2
Totals		11	8	4	16

Second Year – Second Semester

Code	Title	Lect.	Lab.	Disc.	Units
		Hours/ Week			
CSCL2213	Object oriented programming II	2	2	1	3
CSCL2215	Sorting and Searching Algorithms	2	2	1	3
CSCL2217	Numerical Analysis	2	2	1	3
CSCL2219	DataBase Design	2	2	1	3
CSCL2221	Human Rights and democracy	2	-	-	2
CSCL2122	English Language II	2	-	-	2
CSMM2205	Software Engineering II	2	2	1	3
CSMM2206	Coding Techniques	2	-	-	2
Totals		15	10	5	19

Semester	Minor		Major	
	Hours	Units	Hours	Units
1'st	9	13	2	2
2'nd	11	14	4	5
Totals	20	27	6	7

Third Year – First Semester

Code	Title	Hours/ Week			
		Lect.	Lab.	Disc.	Units
CSCL3123	Microprocessor	2	2	1	3
CSCL3125	Computation Theory	2	-	1	2
CSCL3131	Image processing I	2	2	1	3
CSCL3133	English Language III	2	-	-	2
CSMM3107	Iintelligent Search Methods	2	2	-	3
CSMM3108	2D Computer Graphics	2	2	1	3
CSMM3109	Digital Signal Processing	2	-	1	2
CSMM3110	Animation	2	-	-	2
Totals		16	8	5	19

Third Year – Second Semester

Code	Title	Hours/ Week			
		Lect.	Lab.	Disc.	Units
CSCL3224	Computer Architecture	2	2	1	3
CSCL3226	Compiler Design	2	2	1	3
CSCL3232	Image processing II	2	2	1	3
CSMM3211	3D Modelling and Rendering	2	2	-	3
CSMM3212	Geographic Information System	2	-	1	2
CSMM3213	Digital Audio	2	-	-	2
CSMM3214	Adaptive systems	2	2	-	3
Totals		14	10	4	19

Semester	Minor		Major	
	Hours	Units	Hours	Units
1'st	8	9	8	10
2'nd	6	9	10	10
Totals	14	18	18	20

Fourth Year – First Semester

Code	Title	Lect.	Lab.	Disc.	Units
		Hours/ Week			
CSCL4134	Static Web Programming	2	2	1	3
CSCL4136	Operating System I	2	2	1	3
CSMM4115	Multimedia Security I	2	2	1	3
CSMM4117	Computer Network	2	2	1	3
CSMM4118	Data Compression	2	2	1	3
CSMM4119	Digital Video	2	-	-	2
Totals		12	10	5	17

Fourth Year – Second Semester

Code	Title	Lect.	Lab.	Disc.	Units
		Hours/ Week			
CSCL4235	Dynamic Web Programming	2	2	1	3
CSCL4237	Operating System II	2	2	1	3
CSCL4142	English Language IIII	2	-	-	2
CSMM4216	Multimedia Security II	2	2	1	3
CSMM4220	Multimedia Communication Network	2	2	1	3
CSMM4221	Multimedia Data Compression	2	2	1	3
CSMM4222	Pattern Recognition	2	-	-	2
CSCL444	Project	2	2	-	6
Totals		16	12	5	24

1. **Structured Programming I (with C++ Programming Language)**
    ➢Introduction, Structured Programming Principles.
    ➢ Algorithm, Algorithm properties, Examples.
    ➢ Flowcharts, Flowchart Figure, Examples.
    ➢ C++ Language Basics
    ➢Getting started with C++
    • Character set and Identifiers
    • Variables and Variables Declaration
    • Constants Types
    • Arithmetic Operations
    • Assignment Operators
    • Relational Operations
    • Logical Operations
    • Bitwise Operations
    ➢ The compiler directives (define and include).
    ➢ Unary Minus, Increment and /decrement Operators.
    ➢ Selection Statements
    • The Single If Statement Structure, The If/else Statement Structure, Nested If and
    If/else Statements
    • The Switch Selection Statement and Conditional Statement.
    • Break and Continue Control Statements
    ➢ Iteration Statements
    • While Repetition Structure
    • Do/While Statement.
    • For Statement and Nested Loops

References:
1- Mastering C++, Amman-Jordan, AL-Shorok, 2002.
2- Programming with C++ , D. Ravichandran.
3- OqeiliSalch, prof. Department of IT-AL-Balqa Applied University.

2. **Mathematics I**
    ➢ Mathematical background
    ➢ Matrix
    • Types of matrix
    • Matrix addition, subtraction, and multiplication
    • Determinant, transpose, symmetric of matrix and rank of matrix
    • Inverse of matrix, absolute value, and polynomials
    • Grammar rule for solving system of equation.

- ➢ Functions
  - • Function Definition
  - • Domain and range of functions
  - • Graphing of function
- ➢ Limits
  - • Definition of limits
  - • Theorems of limits
  - • Type of limits
  - • One side and two sides limits
  - • Limits as infinity
  - • Sandwich theorem and continues functions
- ➢ Derivation
  - • Mathematical definition of derivation, rule of derivation
  - • Derivation of trigonometric, inverse trigonometric, logarithm, exponential hyperbolic, inverse of hyperbolic function.
  - • Implicit derivation, chain rule, higher derivation

- ➢ **References:**
- ➢ 1- Thomas, G. Calculus and Analytic Geometry, 5th Edition, Addison Wesly, 1999.

3. **Discrete Structures I**
- ➢ Set theory
  - • Sets and subsets
  - • How to specify sets, Operations on sets
  - • Algebra of sets and its proves
  - • Power set, Classes of sets, Cardinality
  - • Sets of numbers, Finite sets and counting principle
- ➢ Mathematical induction
- ➢ Relations
  - • Computer representation of relations and Digraph
  - • Manipulation of relations, Properties of relations
  - • Composition of relations
- ➢ Functions
  - • Type of function (one-to-one & invertible function)
  - • Geometrical characterization of functions

References:
1. Discrete mathematics by Seymour Lipchitz
2. Discrete mathematical structures for computer science by Bernard Kolmanand Robert C. Busby.

4. Computer Organization

- ➢ Introduction to computer architecture
- ➢ Computer definition, History of computer
- ➢ Application with computer system
- ➢ Computer classification [analoge, digital, hybrid]
- ➢ Main parts of a personal computer
- ➢ Hardware: the structure of computer system
    - Input units, Output units
    - Central processing units [CPU] , CPU components [ALU,RS,CU], CPU operations
    - Main memory, Primary storage, Type of main memory [RAM,ROM]
    - Instruction format with memory
    - Secondary storage , Type of secondary storage
- ➢ Software Programs and application programs and utilities
- ➢ System software and operating system and utilities
- ➢ Application packages.
- ➢ Number system
    - Decimal.
    - Binary.
    - Octal.
    - Hexadecimal.
- ➢ Addition and subtraction
    - binary
    - octal
    - Hexadecimal.

References:
1. Computer System Architecture, M. Morris Mano, Third Edition, 1993.

5. Introduction to Statistics

- ➢ Basic concepts
- Statistics
- branches of statistics
- population
- sample
- discrete variable
- continuous variable
- ➢ Data Organization
- frequency distribution table
- histogram
- polygon
- Ogive

- Pareto charts
- Pie graph
➢ Data description measurements
- measurement of central tendency
- measurements of variation
➢ Counting techniques
- Factorial
- Permutations
- combinations

References:
1. Statistics: theories and applications, Joseph Inungo, 2006.
2. Introductory Statistics , Ronald J. Wonnacott
3. الأحصاء د. محمود حسن المشهداني

6. English Language I
➢ Writing and Reading

- Parts of Speech (Noun, verb, adjective, adverb, etc)

- Structure and kinds of sentence

- Tenses in English

- Active and passive voice

- Prepositions of time and place

- How to write and understand simple paragraphs on arrange of topics within the field of the study and interest or experience

- Develop the extensive intensive reading skills by taking different passage

- Write your CV in summary form

- Expose to important technical vocabulary and Idioms

- Write scientific papers and well-structured and

➢ Project Implementation

- Choose a topic and apply the items of scientific writing.

- Make presentation by applying the rules of the four skills of the language.

References :

1. English for computer users By SantiagR.Esteras, Fourth Edition, Cambridge University Press, 2008.

2. English Grammar In Use By Raymond Murphy, Third Edition, Cambridge University Press, 2004.

English Grammar and Composition By Wren and Martin, Revised by N.O.PrasadaRao,S.Chand,, Company Ltd., New Delhi, 2007.

7. **Principles of Digital media- 1'st course**
➢ Introduction to multimedia.
➢ Multimedia and hypermedia.
➢ Multimedia authoring and tools.
➢ Introduction to text.
➢ Basics of computer graphics.
➢ Introduction to digital image.
➢ Basics of digital audio.
➢ Fundamental concepts in digital video.
➢ Multimedia compression techniques.

References
1) Ze-Nian Li and Mark S Drew," **Fundamentals of Multimedia**", Prentice Hall,2004.
2) Gaurav Bhatngar, Shikha Mehta and SugataMitra , "**Introduction to Multimedia Systems**" ,Academic Press,2002.
3) Tay Vaughan" Multimedia: Making it work", Eighth Edition, The McGraw-Hill companies,2010.

1. **Structured Programming II (with C++ Programming Language)**
- Functions
  - Defining a function
  - Return statement
  - Types of functions
  - Actual and formal arguments
  - Local and global variables
  - Parameters passing
  - Recursive functions.
- Arrays
  - One dimensional array (declaration, initialization, Accessing)
  - Two dimensional array (declaration, initialization, Accessing).
- String manipulation
- Structures
  - Type of Structure declaration
  - Array of Structures
  - structure within structure
  - functions and structures
- Pointers
  - pointers declaration
  - pointers and functions parameters passing
  - pointers and arrays
  - arrays of pointers
  - pointers to pointers

References:
1-Mastering C++, Amman-Jordan, AL-Shorok, 2002.
2- Programming with C++ , D. Ravichandran.

3- OqeiliSalch, prof. Department of IT-AL-Balqa Applied University.

2. **Mathematics II**
- Derivation
  - L'hopital rule
  - Application of derivation, velocity and acceleration
- Series
- Integration
  - Indefinite integral
  - Rules of integral
  - Method of integration
  - Multiple integral
  - Definite integral

- Application of integral area under the curve
- Area between two curves

References:
1- Thomas, G. Calculus and Analytic Geometry, 5th Edition, Addison Wesly, 1999.

3. Discrete Structures II

➢ Logic and propositions
- Basic logical operation, Equivalency
- Tautology and Contradiction
- Conditional and biconditional statements
- Argument with examples

➢ Graphs
- Definition, Graphs. Sub graph, and multigraphs
- Degree of graph, Connectivity, Special graph
- Walk & length of walk, Trail, path, cycle
- The bridges of Konigsberg
- Traversable multigraphs, Labeled graphs
- Minimal path, Minimum spanning tree
- Matrices and graph
- Trees, rooted tree, ordered rooted tree
- polish notation, with examples

➢ Finite state machines
- Finite automata
- Optimistic approach to construct FSM
- Deterministic Finite state automata

References:
1. Discrete mathematics by Seymour Lipchitz
2. Discrete mathematical structures for computer science by Bernard Kolmanand Robert C. Busby.

4. Logic Design

➢ Logic gats (AND, OR, NOT)
➢ Class of Digital circuit
- Diode-transistor logic (DTL)
- Transistor – to –transistor logic
- Emittor –Coupled logic
- CMOS

➢ Boolean algebra and simplification and demerger's.
➢ K-map.

- Combinational universal NAND and NOR logic.
- Half-adder, full-adder, 4- bit parallel adder, and Subtract adder.
- Decoder, encoder, multiplexer, and demultiplexer.
- Sequential logic circuits and Flip-flop, SR, D, and JK flip-flop.
- Shift register 3-bit and 4- bit.
- Binary counter 3-bit and 4- bit.
- State diagram FSA, ROM and RAM.

References:
1. Computer System Architecture M.Morris Mano
2. Digital fundamentals by Floyd, 2009
3. Fundamental of digital logic and Microcomputer design, fifth addition.

5. Probability Theory

- Probability theory
  - basic concepts
  - sample space
  - events
  - rules of probability
  - Venn Diagram
  - tree diagram
  - Discrete probability distributions
  - Mean
  - Variance
  - Expectation
  - Binomial distribution
  - Multinomial distribution
  - Poisson distribution
  - Hypergeometric distribution
  - Continuous Distributions
  - Normal distribution
  - Exponential distribution
  - Hypothesis Testing
  - statistical hypothesis
  - test under normal curve
  - Chi- square distribution and test of independency
  - Correlation and Regression
  - scatter Plots
  - correlation coefficient
  - Line of best fit

References:
1. Probability and statistics, theory and applications, Gunnar Blom

2. Probability and statistics for engineers, Richard L. Scheaffer

➢ **Introduction to Multimedia**
- Define what is multimedia.
- Discuss the effects of multimedia in your daily life.
- Identify five multimedia components.
- Explain why multimedia is so powerful to increase human-computer interaction.
- Examine multimedia applications in several areas.

➢ **Multimedia Hardware and Software**
- Understand analog and digital conversion process
- Discuss the hardware requirement of multimedia system
- Classify multimedia software based on its function

➢ **Text and Graphics**
- Describe how to use text-related element in multimedia design correctly.
- Compare and contrast between bitmap and vector graphic.
- Examine how to find graphics and about editing software.

➢ **Multimedia Project Development**
- Discuss 4 main steps in multimedia project development.
- Discuss 7 Processes of Making Multimedia.
- Create a storyboard for the animation project.

➢ **Web-based Multimedia Applications**
- Describe about the characteristics of web-based system
- Examine the examples of web-based multimedia applications.
- Discuss online issues such as copyrights and cybercrime.

➢ **Multimedia Communications**
- Describe the development in multimedia communication.
- List out five basic type of communication networks.
- Examine technological advancement and challenges in communication.

➢ **Emerging Multimedia Research**
- Identify how multimedia research has contributed to our lives.

➢ **Multimedia Future**
- Identify the future multimedia computing technologies.
- Discuss how we will interact with the future computers.

References:

Multimedia Technologies by Banerji, Tata McGraw-Hill Education, 2010.

7. Software Engineering I

- ➤ Introduction to SW engineering,
- ➤ Computer software,
- ➤ What is software engineering,
- ➤ The evolving role of software,
- ➤ Software characteristics,
- ➤ Software engineering principles,
- ➤ The Characteristic of software engineer,
- ➤ Software applications,
- ➤ Software systems,
- ➤ Software development, A crisis on the horizon,
- ➤ The attribute of good software,
- ➤ Software lifecycle
- ➤ Software Engineering-A Layered technology,
- ➤ Software process models,
  - The waterfall model,
  - The prototype model ,
  - The RAD model,
  - Evolutionary software process models,
  - The incremental model,
  - The spiral model
- ➤ Component based development,
- ➤ Introduction to Software process and project metrics,
- ➤ Measures ,
  - Metrics and Indicators,
  - Metrics in the process and project domains,
  - Process metrics,
  - Project metrics,
  - Software measurement,
  - size oriented metrics,
  - function oriented metrics,
  - computing function point,
  - Software Quality Metrics,
  - Defect removal efficiency ,
  - Integration metrics with software process
  - Statistical process control,
  - Metrics for small organization, Establishing a software metrics program,

References
1. Software Engineering by Roger Press Man 2001
2. Introduction to Software Engineering by Shari Lawrence andJoan M. Atlee, 2006
3. Software Engineering, by , Addison Wesly, 1999.

1. Object Oriented Programming I

➢ Overview for functions and parameter transmission
➢ Introduction of OOP and its main features
➢ Classes in OOP
- Defining a Simple Class with Inline Member Functions
- Constructors and destructors functions
- Friends functions
- Constant Members
- Static Members
- Default Arguments and Implicit Member Argument
➢ Overloading
- Function overloading
- Operators overloading

References:
1. "Mastering C++", Prof. OqeiliSaleh and others, Dar Al-Shorok, Amman-Jordan, 2004.
2. "Object Oriented Programming Language with C++", BjarneStroustrup, Addison-Wesley Publication, 2003.
3. " An Introduction to Object-Oriented Programming with **Java**, Fifth Edition", C.Thomas Wu, 2010.
4. "Simply Java—An Introduction to Java Programming", Charles River ,2006

2.Data Structures
➢ Introduction to Data Structures
➢ Types of data structure
➢ Memory representation for 1D and 2D arrays
➢ Linear list and Linear list types
➢ Stack
- Stack Operations
- Applications of stack
➢ Queue
- Queue Operations
- Applications of queue
➢ Circular Queue
- CQueue Operations
- Applications of CQueue
➢ Linked List
- Linked-Stack

- Linked-Queue
- Linked-CQueue
- Recursion

References:
- Data structures and Algorithms with Object- Oriented design Patterns in C++ by: Bruno R. Preiss, B.A.Sc., M.A.Sc.Ph.D., P.Eng. Associate Professor, Department of electronic and computer engineering, university of waterloo.
- Data Structures and algorithm analysis in C, By: Mark Allen Weiss.
- Data Structures and algorithms in Java PDF file.
- Data Structures using C and C++, Yedidyah language, Moshe J. augenstein, Aaeon M. Tenenbaum, Brooklyn College.

3. Mathematics III
- Partial differentiation
- Partial differentiation for first and higher order of derivative
- Chain rule and directional derivative
- First order differential equations
- Solution of differential equation by direct integration
- Separating the variables and homogeneous equation
- Second and higher order differential equations
- Linear second order differential equation with constant
- Variation method
- Laplace transform for standard important function
- Multiplication by tn, division by t
- Inverse Laplace transform of derivatives
- Formatting of Partial differential equation
- Types of partial differential equations
- Fourier series and periodic functions
- Fourier series for odd and even function
- Half range Fourier sin and cosine series
- Change of interval

References:
1- Thomas, G. Calculus and Analytic Geometry, 5th Edition, Addison Wesly, 1999.

4. Database Foundation
- Centralized database system
- Introduction and the purpose of database
- Comparing between a file processing system and DBMS
- Data Abstraction and file system disadvantage
- Entity relationship model

- Entities and entity sets
- Relationships and relationship set
- Attributes and mapping
- Constraints and keys
➢ Relational model
- Data representation in relational model (Tables, Records, and keys)
➢ Tables joining, Instant and schema
➢ Weak entity in ER model
➢ ER model and relational model examples
➢ Indexing
- Primary indexing
- Secondary indexing
- Index update
- Hash index

References:

1-Database Management Systems 2nd Edition, by Raghu Ramakrishnan
2- Database, design, application development, and administration 2nd edition, 2004.

5. Human Right

•مفهوم الحقوق(تعريف الحقوق-خصائص الحقوق.)
•حقوق الانسان في الشرائع السماوية(الديانتين المسيحية واليهودية -الدين الاسلامي.)
•مصادر حقوق الانسان(المصادر الدولية -المصادر الوطنية.)
•ضمانات حقوق الانسان(الضمانات على الصعيد الداخلي -الضماناتعلىالصعيدالدولي.)
•التقدم التكنولوجي واثره على الحقوق والحريات(الاحزاب السياسية -حماية الملكية الفكرية.)

6. Information Theory
➢ Principles of probability theory.
➢ Introduction to Information theory.
➢ Mode of the signal system.
➢ Some particular code : ASCII code & Morse Code
➢ The Measure of Information.
- Self information.
- Average information (entropy) .
➢ Maximum Entropy for Discrete Source.
- Binary source.
- Ternary source.
➢ information rate.
➢ Mutual information.
- Normal noisy channel.
- Noiseless channel.

- Total noisy channel.
- Channel Capacity.
  - Channel Efficiency .
  - Channel Redundancy.
- Symmetric Channel.
- Capacity of symmetric channel.
  - Binary Symmetric Channel (BSC) Capacity.
  - Ternary SymmetricChannel Capacity.
- Cascade channel.

References:
1. Coding and information theory by Richard w. hamming
2. Information Theory and Coding by J. S. Chitode – 2006
3. An introduction to information theory byFazlollah M. Reza.

1. **Object Oriented Programming II**
   - Template
     - Function Template Definition
     - Function Template Instantiation
     - Class Template Definition
     - Class Template Instantiation
   - Inheritance and Derived Classes
     - Single inheritance and Multiple inheritances
     - Virtual Functions and polymorphism
   - The Visual Programming Development Environment
     - Designing the Application Window
     - Adding Code to the Application
     - Creating the Dialog Box Icon
     - Adding Maximize and Minimize Buttons
   - The Basic Windows Controls
     - The Static Text Control
     - The Edit Box Control
     - The Command Button Control
     - The Check Box Control
     - The Radio Button Control
     - The Drop-Down List Box Control

References:
1. "Mastering C++", Prof. OqeiliSaleh and others, Dar Al-Shorok, Amman-Jordan, 2004.
2. "O bject Oriented Programming Language with C++", BjarneStroustrup, Addison-Wesley Publication, 2003.
3. "An Introduction to Object-Oriented Programming with **Java**, Fifth Edition", C.Thomas Wu, 2010.
4. "Simply Java—An Introduction to Java Programming", Charles River ,2006.

2. **Sorting and searching Algorithms**
   - Sorting Algorithm
     - Insertion Sort
     - Selection Sort
     - Bubble Sort
     - Heap Sort
     - Quick Sort
     - Merge Sort

- ➢ Searching algorithm
  - Sequential Search
  - Binary Search
- ➢ Trees
  - Types of Tree
  - Binary tree
  - Binary tree scan
  - Represent Regulars expression using trees
  - Binary Search Tree

References:
- ➢ Data structures and Algorithms with Object- Oriented design Patterns in C++ by: Bruno R. Preiss, B.A.Sc., M.A.Sc.Ph.D., P.Eng. Associate Professor, Department of electronic and computer engineering, university of waterloo.
- ➢ Data Structures and algorithm analysis in C, By: Mark Allen Weiss.
- ➢ Data Structures and algorithms in Java PDF file.
- ➢ Data Structures using C and C++, Yedidyah language, Moshe J. augenstein, Aaeon M. Tenenbaum, Brooklyn College.

3. Numerical Analysis

- ➢ Numerical analysis and solving sets of equation
- ➢ Elimination and iterative methods
- ➢ Interpolating polynomials
- ➢ Lagrange polynomial
- ➢ Solving non-liner equation
- ➢ Numerical differentiation and numerical integration
- ➢ Numerical solution of ordinary differential equations
- ➢ Curve-fitting and approximations.
- ➢ The solution of integral equation, trapezoidal method
- ➢ Simpsons method

References:
1-Calculus and Analytic Geometry by Thomas.

2- Gerald C. F and Wheatley P. O. "Applied Numerical Analysis," Addison Wesley. 1999.

4- Data bases Design

- ➢ Database Administrator and database design process
- ➢ Data base cardinality
- ➢ Normalization
- ➢ System architecture

➢ Transaction
➢ Database security
• Access control
• Encryption
➢ Fundamental of relational algebra:
➢ Query processing

References:
1-Database Management Systems 2nd Edition, by Raghu Ramakrishnan
2-Database, design, application development, and administration 2nd edition, 2004.

5. Democracy

ـ مفهوم الديمقراطية(تعريف الديمقراطية- مزايا الديمقراطية).

ـاشكال الديمقراطية(الديمقراطية المباشرة- الديمقراطية شبه المباشرة-الديمقراطية النيابية-المجلس النيابي).

ـالية النظام النيابي-الانتخاب-(مفهوم الانتخاب-هيئة الناخبين-تنظيم عملية الانتخاب-نظم الانتخاب).

6. Software Engineering II

➢ Introduction to Software project planning,
  • Estimation reliability factors,
  • Project planning objective,
➢ Software Scope, Estimation of resources,
• Software project estimation options,
• Decomposition techniques,
• Estimation models,
  • The structure of estimation models,
  • The COCOMO Model, The software equation model,
  • Automated estimation tools,
➢ introduction to risk analysis and management,
  • reactive versus proactive risk strategies,
  • software risks,
  • risk projection,
  • risk refinement,
➢ project scheduling and tracking,
  • basic concepts,
  • scheduling principles,
  • error tracking
➢ software quality,
  • quality concepts,

- Statistical software quality,
- Software reliability,
- Software availability,
- Introduction to analysis concepts and principles,
- requirement analysis,
- Software requirement analysis phases,
- Software requirements elicitation,
  - Facilitated action specification technique,
  - Quality function deployment,
  - Use case, Analysis principles,
- Analysis principals
  - Information domain
  - Modeling
  - Partitioning
  - Sw requirement view
- Software prototyping,
- Specification principles.

References
1-Software Engineering by Roger Press Man 2001
2-Introduction to Software Engineering by Shari Lawrence andJoan M. Atlee, 2006
3-Software Engineering, by , Addison Wesly, 1999.

7- Coding Techniques
- Principles of probability theory.
- Principles of information theory .
- Introduction to coding techniques.
- Entropy , Average length of a code.
- code efficiently , code redundancy.
- Fixed length coding.
- Variable length coding.
- Shannon-Fano coding algorithm.
- Huffman coding
  - Huffman Binary coding.
  - Huffman Ternary coding.
- Extension of a source
- Hamming code.
  - Error detection code.
  - Error correction code.

References :
1. Coding and information theory by Richard w. hamming
2. information theory and Coding by J. S. Chitode – 2006

3. An introduction to information theory byFazlollah M. Reza.

8-English Language II

➤ **Listening and Speaking :-** (by listening to a selected conversations on technical topics)

- How to understand a conversion
- How to avoid silence in conversion
- Focus and study the pronunciation.
- Deal with different situations academic and non academic.
- Express ideas and give detailed accounts of experiences, and describing feelings.
- Engage in extended conversation on most topics
- Give opinions by providing relevant explanations, arguments and comments.
- Give clear, detailed description of subjects within field of study or interest.
- Vocabulary and phrases for making presentations
- Give clearly developed presentations on subjects in the field of study.

➤ **Translation**

- What is the translation , kinds and steps of translation
- Scientific translation nature and steps
- How to use a dictionary and machine translation.

References :

1. English for computer users By SantiagR.Esteras, Fourth Edition, Cambridge University Press, 2008.

2. English Grammar In Use By Raymond Murphy, Third Edition, Cambridge University Press, 2004.

3. English Grammar and Composition By Wren and Martin, Revised by N.O.PrasadaRao,S.Chand,, Company Ltd., New Delhi, 2007.

1- <u>**Micro-processors – 1'st course**</u>

➤ Introduction to Microprocessor and Microcomputer system.
   - Microprocessor Architecture and Register Set.
   - System Buses
   - Memory types and physical addressing.
   - I/O devices
➤ Instruction Set and Format
➤ Addressing Modes
➤ Introduction to Assembly Programming Language.
   - Arithmetic and logical Instructions (Shift and Rotate).
   - Program Control (interrupt and subroutine call).

References:
1. Abel P., "IBM PC Assembly Language and Programming", 4th Edition, Prentice Hall, 1998..
2. Thorne M., "Computer Organization and Assembly Language Programming", 2nd Edition, Benjamin/Cummings, 1990.

2- <u>**Computation Theory:**</u>
➤ Regular Expression,
➤ Finite Automata, DFA and NFA, Equivalence of NFA and DFA,
➤ Kleen theorem,
➤ Two way finite automata with output (mealy machine, moor machine), The equivalence of mealy and moor machine,
➤ Introduction to Crammers, Phrase Structure Grammar, Context sensitive Grammar, Context Free grammar,
➤ Chomsky Normal Form,
➤ Tree, leftmost and rightmost derivations,
➤ Regular grammar, Left linear grammar, Right linear grammar, Push down automata, Top down –bottom up derivation,
➤ Turing machine.

References:
1. H.R.LewisAnd G.H Papadimitiou,"Elements Of The Theory Of Computation", Prentig-Hall, 1981.
2. R.W.Floyd And R.Beigel,"The Languae Of Machine:An Introduction To Computability And Formal Languages"Computer Science Press, Network, 1994.
3. M.Sipser."Introduction To The Theory Of Computation" ,Boston Pws Pub ,1996.

3.**Image ProcessingI**
➤ Computer Imaging: Computer Vision (CV), Image Processing (IP). Image Restoration, Enhancement and Compression.

- ➢ Computer Imaging Systems and Digitization.
- ➢ Image brightness Adaption. Image Representation. Digital Image File Format.
- ➢ Image Quantization: Gray and Spatial Quantization.
- ➢ Image analysis Preprocessing, Data Reduction, Features Analysis.
- ➢ Zoom algorithms, Zero order Hold and First order Hold.
- ➢ Convolution algorithm.
- ➢ Image Algebra: Arithmetic Operations.
- ➢ Image Algebra: Logic Operations. Image Restoration.
- ➢ Noise Removal using Spatial Filters: Mean, Median and difference Filters.
- ➢ Edge /Line Detection. Sobel Operator. Prewitt Operator. Kirch Compass Mask. Robinson Compass Masks. Laplacian Operators.
- ➢ Image smoothing and image sharpening.
- ➢ Introduction to Histogram.
- ➢ Histogram Modification: Shrinking, Stretching and Sliding mapping functions.
- ➢ Histogram Equalization.

References:

[1] Computer Vision and Image Processing. Scotte E Umbaugh, Ph.D.
[2] Digital Image Processing .Second Edition
[3] Rafael C. Gonzalez/University of Tennessee Richard E. Woods Med Data Interactive.

4.English language III

- ➢ A world of difference
- ➢ The working week
- ➢ Good times, badtimes
- ➢ Getting it right
- ➢ Our changing world
- ➢ What matters to me
- ➢ Skills development
- ➢ IT depends how you look at it
- ➢ All things high tech

References:

1- New Headway 4th edition intermediate student book, Liz and John Soars.
2- New Headway 4th edition intermediate work book, Liz and John Soars

5.Intelligence Search Methods- 1'st course

- ➢ Principles fundamentals of A.I.
- ➢ What means by A.I.
- ➢ Knowledge Representation Methods.
- ➢ Control strategy of Search Methods.
  - • Blind Search
  - • Heuristic Search

- ➢ Some Metaheuristic Algorithms.
  - • What means by Metaheuristic?
  - • Local Search.
  - • Tabu Search.

- Simulated Annealing.
- VNS.
- GRASP.

References:

1. A.I. Strategies & Methods, George F. Luger, 2009.

6. 2D Computer Graphics

- Introduction { Computer Graphics, Cathode Ray Tube (CRT) , Generating color on a RGB monitors, Coordinates system, Raster–can display, Frame Buffer, Scan conversion, Applications of computer graphics }
- Vectors {unit vector, measurement associated with vectors, manipulation vectors, negative vectors and subtracting vectors, scaling Vectors, multiplying vectors uses the "dot Product" , direction Cosine , **"Cross Product"**
- Basic Shapes Drawing (Line, Circle, Ellipse)
- Two Dimension Transformations(Translation, Scaling, Rotation, Reflection, shearing)
- Clipping and Windowing and viewport and polygon

References:
1. Riškus, "Approximation of a Cubic Bézier Curve by Circular Arcs and Vice Versa", Information Technology and Control, 2006.
2. Juhász, "Approximating the helix with rational cubic Bézier curves" Computer-Aided Design, 1995.

7. Digital Signal Processing
- **Signals and systems**
  - Introduction to DSP
  - D/A, A/D and sampling rate
  - Basic types of digital signals
  - Periodic and periodic signal
- **Discrete time system**
  - System proprieties
  - Block diagram representation of LTIS
  - Step and impulse response of LTIS
  - Convolutions andDe-convolution
  - Correlation.
- **Fourier analysis**
  - Discrete time FT and its properties
  - Frequency response
  - FFT and properties
  - Inverse FFT.

- ➢ **Wavelet Transformation**
  - • Haar based Wavelet Transform
  - • Db4 based Wavelet Transform
- ➢ **Z-transform**
  - • One side properties
  - • Inverse z-transform
  - • poles, zeros location in z-plane and the stability
- ➢ **Design of digital filter**
  - • Fundamental structures of digital filters
  - • Design of FIR filters by windowing
  - • Design of IIR filter

References:

1. Emmanuel Ifeachor, Barrie W. Jervis, " Digital Signal Processing, A practical Approach" Second edition2013.

8.Animation

- ➢ Introduction
- ➢ Design for motion
- ➢ Style frames
- ➢ Design boards
- ➢ Developing Concepts
- ➢ Process to outcome
- ➢ The inner eye
- ➢ The outer eye
- ➢ Image making

References
Design for motion fundamentals techniques of motion design, Austin Shaw, copyright Material, 2016.

1-Computer Architecture – 2nd course

- ➢ Introduction to Computer Organization
  - RISC and CISC
  - I/O Organization and Peripheral Control Strategies.
  - I/O Interfaces and Programming
  - Asynchronous data transfer
- ➢ Memory Management.
  - Memory types and Hierarchy
  - Main Memory address map.
  - Associative Memory and Content Addressable Memories.
- ➢ Parallel Processing
  - Pipeline (general consideration).
  - Arithmetic Pipeline.
  - Instruction Pipeline.
  - Difficulties and Solutions in Instruction Pipeline.
  - Vector processing and Array Processing.

References:
1. M.M Mano "Computer System Architecture " third Edition, Prentice Hall, 1993.
2. David A. patterson And John L.Hennessy, "Computer Organization And Design " Morgan Kaufmann, 1998.

2- Compiler Design:
- ➢ Introduction to Compiler,
- ➢ Lexical analysis,
- ➢ Syntax of Analysis,
- ➢ Problems of Compiler,
- ➢ First and Follow,
- ➢ Top down Parsing, Predictive Parsing Method, LL(1),
- ➢ Bottom up Parsing, Operation Precedence Parser, Simple Left to Right Parser, Canonical LR Parser,
- ➢ Semantic Analysis,
- ➢ Intermediate Code Generation,
- ➢ Code Optimization,
- ➢ Code Generation.

References: Principles of Compiler Design, Alfred V. Aho, Jeffry D. Ulman 2003.

3. Image Processing II
- ➢ Feature extraction.
- ➢ Feature analysis.
- ➢ Binary Object features.
- ➢ Histogram Features.
- ➢ Image Segmentation and connectivity.
- ➢ Region Growing and Shrinking Boundary Detection.
- ➢ Morphological operations.
- ➢ Clustering Technique Combined Approach.
- ➢ Discrete Transform. Fourier Transform.
- ➢ Cosine Transform.
- ➢ Wavelet Transform.
- ➢ Compression System Model: Compression Ratio and Entropy.
- ➢ Lossless Compression Methods and Lossy Compression Method.
- ➢ Huffman and Run Length Coding.
- ➢ Fidelity Criteria.

References:
1-Computer Vision and Image Processing.Scotte E Umbaugh, Ph.D.
 2- Digital Image Processing .Second Edition
   Rafael C. Gonzalez/University of Tennessee Richard E. Woods Med Data   Interactive.

4.3D Modeling and Rendering
- ➢ Mathematics for Modeling
- • Vector tools and polar coordinates – Vectors fundamentals– Representations of key geometric objects – Intersection of lines, planes and polygons - clipping algorithms – 2D and 3D Affine transformation – 3D Viewing – 3D rendering pipeline – Camera movements – introduction to OpenGL programming – Geometric transformation and viewing – projection and perspective transformation.
- ➢ Modeling Shapes
- • Introduction – solid modeling – polyhedral – Extruded shapes – tessellation – Mesh approximation of smooth objects – Bezier Curves – B splines – NURBS – Interpolation – Hierarchical and physical modeling – Hidden surface removal algorithms– Curve and surface – Interactive graphics.
- ➢ Shading and Illumination Models
- • Shading models – Flat shading – Smooth shading – Reflections – Diffuse and specular reflection – Adding color – Antialiasing techniques – Dithering techniques – Creating more shades and color – Opengl – specular highlights – Spotlight – Blending – Reflections – Applying colors– Real world lights.
- ➢ Texture and Rendering
- • Procedural and Bitmaps Textures – Texture Mapping or Image – Bump Mapping – Environmental Mapping – Magnification and Minification - Minmapped Textures – Ray Tracing Techniques – Adding Textures on to Curved Surfaces – Tiling – Fractals – Texture Mapping.

References

1- F.S. Hill Jr., Stephen Kelly, "Computer Graphics Using OpenGL", 3rd Edition, Pearson Education /PHI Learing, 2007.

2 -Donald Hearn, M. Pauline Baker, "Computer Graphics with OpenGL", 3rd Edition, Pearson Education, 2012.

5.Geographic Information Systems GIS

- ➢ Introduction to GIS
  - • Some fundamental
  - • A first function of GIS
  - • Spatial data geo in formation
  - • Application of GIS
- ➢ The real world and representation of it
  - • Modeling
  - • Maps
  - • Databases
  - • Spatial database
- ➢ Geographic information and spatial data types
  - • Geographic phenomena
  - • Geographic phenomena defined
  - • Diffent types of geographic phenomena
  - • Geographic field
  - • Geographic object
  - • Boundaries
- ➢ Computer representations of geographic information
  - • Regular tessellations
  - • Irregular tessellations
  - • Vector representations
  - • Topology and spatial relationships
  - • Scale and resolution
  - • Representation of geographic fields
  - • Representation of graphic objects
- ➢ Data Processing systems
  - • Hardware and software trends
  - • Geographic information systems
  - • Database management system
- ➢ Data entry and preparation
  - • Spatial data input
  - • Spatial referencing
  - • Data preparation
  - • Point data transformation
  - • Advance operations on continuous field rasters

- ➢ Spatial data analysis
  - • Classification of analytics GIS capabilities
  - • Retrieval, classification and measurement.
  - • Overlay functions
  - • Neighborhood functions
- ➢ Data visualization
  - • GIS and Maps
  - • The visualization strategies: present or explore
  - • The cartographic toolbox
  - • How to map
  - • Map cosmetics
  - • Map output
- ➢ Data quality and meta data
  - • Basic concepts and definitions
  - • Measures of location error on maps
  - • Error propagation in spatial data processing
  - • Meta data and data sharing

References:
Principles of geographic information systems, Oho Huismun& Rolf A. de By, ITC, 2009.

6. **Digital Audio**
- ➢ Introduction to multimedia
- ➢ Multimedia applications and requirements.
- ➢ Basics of digital audio
- ➢ Synthetic sounds
- ➢ Introduction to MIDI (Mutual Instrument Digital interface)
- ➢ Audio signal, Sampling rate, Nyquist theorem
- ➢ Audio modulation (amplitude modulation, frequency modulation)
- ➢ Audio compression
- ➢ Digital rights management

References
1- Digital video and Audio broadcasting technology, Walter Fischer, 2010.
2- Digital video and audio Compression, Stephen J. Solari, 1997.
3- Fundamental of Digital Audio, new edition, David Patschke, Alan P. Kefauver,2007.

7. **Adaptive Systems**
- ➢ Neural Networks
  - • Background
  - • The Neuron: Biological and Simulated Neuron.
  - • Types of Learning Strategies.

- Back Propagation, Hopfield, BAM and Kohonen NN.

➢ Genetic Algorithms (GA)
  - Introduction & historical view.
  - Components of algorithms: Selection methods and Operators.
  - Crossover and Mutation.
  - Parameters of GA.
  - GA and search methods.
  - Genetic Programming and Applications.
➢ Fuzzy Logic
  - Introduction.
  - Fuzzy sets: Continuous Fuzzy sets, Discrete Fuzzy sets.
  - Logical operators: Fuzzy intersection, Fuzzy implication, Fuzzy union.
  - Compositional rule of inference (continuous & discrete).
  - Fuzzification&Defuzzification.

References
1- Fundamentals of Neural Networks: Architecture, Algorithms, and application. By LaureneFausett.
2- A.I. Strategies & Methods, George F. Luger, 2009.
3- Neural Networks. Fundamentals, Application, Examples. By Werner Kinnebrock
4- Machine Learning, Tom Mitchell, McGraw Hill, 1997.
5- Fuzzy system hand book, Byearl Cox, 1999.
6- Metaheuristics : from design to implementation, El-GhazaliTalibi, John Wile & Sons, 2009.

1- Static Web Programming

➢Web Based Application, Introduction
• The world wide web
• The internet and web
• The history and growth of the web
• internet service provider
• Http
• The purpose of the web
• web application
• The web concepts Hypertext, web page, web site, web page address
➢ Internet TCP/IP , client/server, URL , Web Based Application, web browsing, The classifying the web sites, environment, the general approach, range of complexity, web application ,web page, web site , Classifying the Web Sites
➢ HTML basic tags (head, body, b ,p, I, u sup, sub)
➢ HTML insert image and link to pages (bgcolor, other attribute) image maps , list tags , tables tags , form tags , frameset.
➢ Introduction to CSS cascading style sheet
➢ External Stylesheet & Internal Stylesheet
➢ JavaScript Introduction , Put a JavaScript into an HTML page , JavaScript Arithmetics
➢ Logical Operators
➢ Conditional Statement
➢ JavaScript Functions
➢ JavaScript Popup Boxes
➢ Array, Loops JavaScript
➢ JavaScript getElementById

References:
1- Web Based Application.
2- Web Programming with ASP.

2- Operating system I
➢ Operating Systems Definition
  • Computer-System Architecture
  • Single-Processor Systems
  • Multiprocessor Systems
  • Clustered Systems

➢ Operating-System Structure
  • Operating-System Operations
  • Process Management
  • Memory Management
  • Storage Management
  • Protection and Security

- ➢ Operating-System Services
  - User and Operating-System Interface
  - Command Interpreters
  - Graphical User Interfaces
  - System Calls
  - Types of System Calls
  - Process Control
  - File Management
  - Device Management
  - Information Maintenance
  - Communication
  - Protection
  - System Programs

  - Operating-System Services
  - The Process
  - Process State
  - Process Control Block
  - Threads
  - Process Scheduling
  - Scheduling Queues
  - Schedulers
  - Context Switch

- ➢ CPU Scheduling
  - Basic Concepts
  - CPU–I/O Burst Cycle
  - CPU Scheduler
  - Preemptive Scheduling
  - Dispatcher
  - Scheduling Criteria
  - Scheduling Algorithms
  - First-Come, First-Served Scheduling
  - Shortest-Job-First Scheduling
  - Priority Scheduling
  - Round-Robin Scheduling
  - Multilevel Queue Scheduling
  - Multilevel Feedback Queue Scheduling

- ➢ Main Memory
  - Basic Hardware
  - Address Binding
  - Logical Versus Physical Address Space
  - Dynamic Loading
  - Dynamic Linking and Shared Libraries
  - Swapping
  - Contiguous Memory Allocation

- Memory Protection
- Memory Allocation
- Fragmentation
- Segmentation
- Segmentation Hardware
- Paging
- Protection
- Shared Pages

➢ Process Synchronization
- Background
- The Critical-Section Problem
- Peterson's Solution
- Synchronization Hardware
- Semaphores
- Semaphore Usage
- Classic Problems of Synchronization
- The Bounded-Buffer Problem
- The Readers–Writers Problem
- The Dining-Philosophers Problem

References

"Operating System Concepts" by Silberschatz, Galvin and Gagne, 2010
Operating System Concepts – 10th Edition Operating System Concepts – 11th Edition
power point for Operating System Concepts – 9th Edition

3- English Language IIII

➢The tense systsem (simple ,cont,perfect, active and passive voice)
➢ Present perfect simple and continuous ,Hot verbs
➢ Narrative tenses(Past simple ,past continuous , past perfect ,active and passive voice)
➢ questions and negative, saying the opposite, prefixes and antonyms in context.
➢ future form , expression of quantity ,words with variable stress
➢ modules and related verbs
➢ relative clauses, adverb collocation

References
1. New Headway plus 4th edition intermediate student book, Liz and John Soars.
2. New Headway plus 4th edition intermediate work book, Liz and John Soars.

4- **Multimedia Security I**

- Introduction of Data security,
- Mathematical Background,
  - How Compute the Greater common deviser (GCD) using different methods,
  - Explain the methods to compute the Inv,
  - Explain the methods to find Euler notation and compute inv using Euler notation,
- Types traditional of ciphers systems,
- Introduction of transposition cipher systems,
- fixed pired method,
- Types of substitution cipher systems types,
- Mono alphabetic substitution cipher systems (keywords method),
- Homophonic substitution cipher systems(Beal cipher, Higher order homophonic) ,
- polyaphabetic substitution cipher systems(Vigener cipher, Beaufort cipher ,Running ker cipher),
- polygram substitution cipher systems(playfair cipher, hill cipher ,product cipher),
- Introduction to public key systems (secrecy and authenticity), Knapsack ciphers), Merkel-Hellman knapsacks, simple knapsack algorithm),
- Trapdoor knapsack algorithm, RSA algorithm (encryption and decryption processes), Public-key digital signature algorithms (RSA), DES algorithm, X-box process in DES algorithm with example,
- Introduction of Stream ciphers, One time Pad system (vernam system), The requirements of steam cipher,
- The Basic Five Randomness tests (i.e. frequency test , serial test), Poker test , run test, auto correlation test.
- Introduction to Information Hiding,

References:
1- Embedded Multimedia Security Systems Algorithms and Architectures, Prasant Mohapatra, Springer-Verlag London 2013.
2- Cryptography and Network Security, William Stalling , 2003
3- Information Hiding Techniques for Steganography and Digital Watermarking, Stefan Katzenbeisser & Fabien A. P. Petitcolas, , 2000.

5- **Computer Network**

- Data Communication,
- Physical Topology,

- ➤ Basic Network Technology,
- ➤ LAN Devices,
- ➤ Collision and Collision Domains in Shared Layer Environments, Network Devices,
- ➤ Network Layer Addressing,
- ➤ Network Layer Field and Datagram,
- ➤ IP address Class, Subnet NW, Private Addresses,
- ➤ Transmission of Digital Data Interfaces and Modems,
  - • Transmission Media, Unguided Media, Satellite
- ➤ Communication, Error Detection and Correction,
- ➤ Data Link Control Multiplexing, De Multiplexing,
- ➤ Data Link Protocols, ARP, FTP, TELNET, DNS, UDP, TCP, NFS and RPC, SMTP, TFTP, HTTP, WAIS, Gopher, SNMP, WWW,
- ➤ Browser Architecture,
- ➤ Methods for Assigning IP Address, Advance ARP, DHCP, Dynamic Addressing,
- ➤ Routable and non Routable Protocols, RIP Features.

References:
1- "Computer Networks", 3rd Edition, A. Tannenbaum, Prentice-Hall, 1996.
2- "Data Communications, Computer Networks and OSI", 4th Edition, F. Halsall, Addison-Wesley, 1995.

6- Data Compression

- ➤ Introduction to data compression
  - • Type of data compression
  - • Compression Performance
- ➤ Basic Techniques
  - • Run Length Encoding
  - • Run Length Text Compression
  - • Run Length Image Compression
- ➤ Statistical Methods
  - • Source Coding Technique
  - • Shannon – Fano Method
  - • Huffman Method
  - • Extension of Code
- ➤ Prefix Code
  - • General Prefix Code
  - • The Golomb Code
  - • Other Prefix Code
  - • Variant of Huffman , MNP5
- ➤ Dictionary methods
  - • Static Dictionary methods
  - • Dynamic Dictionary methods

LZ77 Sliding window
LZ78 Dictionary methods
LZW Dictionary methods
  ➢ Arithmetic Coding

References:

1- Handbook of Data Compression Fifth Edition, Springer-Verlag London Limited 2010.

6.Digital Video

  ➢ Basics of video (types of video signals, component video, composite video, s-video).
  ➢ Analog video (NTSC video, PAL video, SECAM video).
  ➢ Digital video
  ➢ Color video representations.
  ➢ Characteristics of video streams
  ➢ Video formats.
  ➢ Video compression.
  ➢ Video equipment and applications.
  ➢ Motion Estimation and Transform Coding.
  ➢ Video Modeling and Retrieval.
  ➢ Video Transcoding.
  ➢ Video quality evaluation methods and metrics (Monitoring and QoS Measurement, Video Quality Measurements).

References:
4- Digital video and Audio broadcasting technology, Walter Fischer, 2010.
5- Digital video and audio Compression, Stephen J. Solari, 1997.
6- Fundamental of Digital Audio, new edition, David Patschke, Alan P. Kefauver,2007.

2-

7. Project

Description for Research Project

Research project is an study proposed by teacher (supervisor) and developed by student (fourth class only), this study aim to train the student on it is specialization of scientific (the scientific branch in computer sciences).

Time for Research Project

The Student given full academic year for accomplishes his study.

Exam for Research Project

Research project will be evaluated by a supervisor and Committee of Experts.

Format for Research Projects

Research projects are written up in standardized format. Be formal & objective in English language, & cite all sources. The format includes the following sections:

Title

Title would normally include the major variables of student study. For example:

"A protection system for an Internet site"

Abstract

Begin with a brief Abstract of the study, which summarizes the entire study into one paragraph. The reader should be able to tell from Abstract what theory and hypothesis were, who you studied and how, what your findings were, and what they meant for the theory.

Introduction

The introduction includes a brief (~2-3 page) review of current theory & research in the area of your topic. In presenting this material, paraphrase it into your own words, but always cite the source of the information. Referencing must be complete & correct, or you are plagiarizing, which is a serious academic offence. End with an introduction to your study, including your hypothesis.

Method

1. Materials/Instruments , Describe any instruments employed to measure the variables of your study. (e.g. questionnaires, tests, etc.)
2. Procedure , The Procedure section reviews exactly how you did your study, & should include enough detail that anyone could repeat your procedure. Include your methodology (e.g. whether you did an experiment, or observation, etc.); a review of how you carried out the study; & any data analysis that you did.

Results

Include your results, summarized & presented in a way that is easy to follow & to understand. If possible, these results should be presented both in a table (which would include descriptive & inferential statistics) & in a written description of the results. The results section should not include conclusions or interpretations; these would be in the Discussion section.

Discussion

Use the discussion to relate your results to the theory you described in the introduction. The "why" of your results are discussed here, & what they mean in terms of theory & research. Add a discussion of the limitations of your study.

References

All references in the introduction are included in the reference section at the end of the research report, in alphabetical order.

Appendix

Any information that is relevant to the study, but not needed within the body of the paper, should be included at the end of the report. These appendices would include further details of the research instructions, materials, results, psychological measures, etc., if needed. Your instructor may also wish you to attach the raw data of your project.

1- Dynamic Web Programming

➢JavaScript Functions, Lifetime of JavaScript Variables, Event Handler,
➢ Array, string and methods ,Insert Special Characters, Create New object
➢ Method of object set and get date, JavaScript Math Object
➢ Search Function Regular Expression , Form Validation ,
➢ JavaScript getElementById
➢ ASP Principles, IIS: internet information server
➢ ASP Objects, Response Object, write , clear, end, redirect, Request Object, get and post methods form and Queerstring, Cookies
➢ Active server pages Create & retrieve cookies, ASP-File System Object
➢ File system object copyfile, copyfolder, createtextfile, deletefile, deletefolder,
➢ ADO , SQL, Connection asp with database, objects Insert from asp to db Update ,delete Application e-mail

References:
1- Web Based Application.
2- Web Programming with ASP.
3- Multimedia Web Programming (Grassroots) Paperback , by Adrian Moore,2005.

2- Operating system II

➢ DeadLock
- System Model
- Necessary Conditions
- Resource-Allocation Graph
- Methods for Handling Deadlocks
- Deadlock Prevention
- Deadlock Avoidance
- Safe State
- Resource-Allocation-Graph Algorithm
- Banker's Algorithm
- Safety Algorithm
- Resource-Request Algorithm
- Dead Lock Detection
- Detection-Algorithm Usage
- Recovery from Deadlock

➢ Mass-Storage Structure
- Overview of Mass-Storage Structure
- Magnetic Disks
- Disk Scheduling

- FCFS Scheduling
- SSTF Scheduling
- SCAN Scheduling
- C-SCAN Scheduling
- LOOK Scheduling

➢ Virtual Memory
  - Demand Paging
  - Page Replacement
  - Basic Page Replacement
  - FIFO Page Replacement
  - Optimal Page Replacement
  - LRU Page Replacement

References

"Operating System Concepts" by Silberschatz, Galvin and Gagne, 2010
Operating System Concepts – 10th Edition   Operating System Concepts – 11th Edition
power point for Operating System Concepts – 9th Edition

3- **Multimedia Security II**

➢ Principles of Steganography (Frameworks for Secret Communication, Security of Steganography Systems, Active and Malicious Attackers),

➢ Steganalysis Introduction and Terminology,

➢ Multimedia Encryption Problem, the Secure Wavelet Transform, Chaos and Cryptography.

➢ Watermarking techniques, watermarking applications.

➢ Biometric Recognition

➢ Multimedia Fingerprinting.

References:

8. Embedded Multimedia Security Systems Algorithms and Architectures, Prasant Mohapatra, Springer-Verlag London 2013.
9. Cryptography and Network Security, William Stalling , 2003
10. Information Hiding Techniques for Steganography and Digital Watermarking, Stefan Katzenbeisser & Fabien A. P. Petitcolas, , 2000.

4.Multimedia Communications Network

- ➤ Architecture of Internet Multimedia Communication– Protocol Stack– Requirements and Design challenges of multimedia communications– Multimedia distribution models– Unicasting, Broadcasting and Multicasting.
- ➤ End to end solutions– Multimedia over TCP– Significance of UDP– Multimedia Streaming– Audio and Video Streaming– Interactive and non Interactive Multimedia.
- ➤ DIMENSIONS OF MULTIMEDIA COMMUNICATION, Multimedia Communication Applications, Streaming Versus Downloading, Streaming Media on Demand, Live Broadcast, and Real-Time Communication, Online Versus Off-Line Encoding.

References:
1- A Review of Multimedia Networking ,Alan Taylor and Madjid Merabti

Multimedia Data Compression /course 2

1. **Image Compression**
   - JPEG Compression
       - The Discrete Cosine Transform
       - Quantization.
       - Coding
   - Progressive Image Compression
2. **Video Compression**

   - Digital Video
   - Video Compression
       - Differencing
       - Block difference
       - Motion Compensation
   - MPEG Compression
       - MPEG-1 Main Component
       - MPEG-4
       - H.261
3. **Audio Compression**
   - Digital Audio
   - Conventional Audio Compression Methods
   - Lossy Sound Compression
   - μ-Law and A-Law Companding

References:

1. Data Compression the Complete Reference, Davide Salamon, fourth edition, Springer.
2. Handbook of Data Compression Fifth Edition, Springer-Verlag London Limited 2010.

3-

11. Pattern Recognition

- ➢ Introduction of pattern recognition

- ➢ Basic Concepts of pattern recognition

- ➢ Optical Pattern Recognition

- ➢ Object Description and Representation

- ➢ Feature Selection and Generation

- ➢ SIFT and SIRF

- ➢ Harris Corner Detection

- ➢ Template Matching

- ➢ Clustering Techniques

- ➢ Clustering Algorithms

- ➢ Classification

- ➢ ID3 Algorithm

- ➢ OCR

- ➢ Pattern recognition Applications

References:

1- pattern recognition. Sergios Th., second edition.
2- Supervised and Unsupervised Pattern Recognition J. David Irwin, *Auburn University*

7. Project

Description for Research Project

Research project is an study proposed by teacher (supervisor) and developed by student (fourth class only), this study aim to train the student on it is specialization of scientific (the scientific branch in computer sciences).

Time for Research Project

The Student given full academic year for accomplishes his study.

Exam for Research Project

Research project will be evaluated by a supervisor and Committee of Experts.

Format for Research Projects

Research projects are written up in standardized format. Be formal & objective in English language, & cite all sources. The format includes the following sections:

Title

Title would normally include the major variables of student study. For example:

<center>"A protection system for an Internet site"</center>

Abstract

Begin with a brief Abstract of the study, which summarizes the entire study into one paragraph. The reader should be able to tell from Abstract what theory and hypothesis were, who you studied and how, what your findings were, and what they meant for the theory.

Introduction

The introduction includes a brief (~2-3 page) review of current theory & research in the area of your topic. In presenting this material, paraphrase it into your own words, but always cite the source of the information. Referencing must be complete & correct, or you are plagiarizing, which is a serious academic offence. End with an introduction to your study, including your hypothesis.

Method

8. Materials/Instruments , Describe any instruments employed to measure the variables of your study. (e.g. questionnaires, tests, etc.)

9. Procedure , The Procedure section reviews exactly how you did your study, & should include enough detail that anyone could repeat your procedure. Include your methodology (e.g. whether you did an experiment, or observation, etc.); a review of how you carried out the study; & any data analysis that you did.

Results

Include your results, summarized & presented in a way that is easy to follow & to understand. If possible, these results should be presented both in a table (which would include descriptive & inferential statistics) & in a written description of the results. The results section should not include conclusions or interpretations; these would be in the Discussion section.

Discussion

Use the discussion to relate your results to the theory you described in the introduction. The "why" of your results are discussed here, & what they mean in terms of theory & research. Add a discussion of the limitations of your study.

References

All references in the introduction are included in the reference section at the end of the research report, in alphabetical order.

Appendix

Any information that is relevant to the study, but not needed within the body of the paper, should be included at the end of the report. These appendices would include further details of the research instructions, materials, results, psychological measures, etc., if needed. Your instructor may also wish you to attach the raw data of your project.