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COURSE SYLLABUS

CT 1400 – COMPUTER SKILLS (REQUIRED COURSE)

Course Catalog Descriptions

This course serves as an introductory course for the engineering/Nursing/computer/science colleges. It includes topics such as: introduction to computing and information technology, networks, internet, and introduction to database; productivity skills: (word processing, spreadsheets, presentations, information, communications, and networking); problem solving: (flow charts, introduction to algorithms, control structures); computer programming: (programming languages, compilers, Pseudo code examples).

Course Requirements

- **Pre-requisite:** None
- **Credit Hours:** 3 CHs
- **Contact Hours:** (2 hours lecture, 0 hour tutorial, 2 hours Lab)

References

- **Textbooks:**
Maureen Sprankle and Jim Hubbard, “Problem Solving and Programming Concepts”, 9th ed., Prentice Hall, 2012, ISBN-10: 0132492644 ISBN-13: 9780132492645

Topics

Topic	Week	Reference
1. Introduction to Computer and Programming	1	Ch#1
2. Introduction to Computer and Programming	2	Ch#2
3. Computer Block Diagram, Hardware devices, System Software and Application Software	3	Ch#3
4. Data representation- binary system	4	Ch#4
5. Software-System Software -Application Software - Operating System	5	Ch#5
6. introduction to computer networks	6	Ch#6
7. Introduction to the Internet and Web	7	Ch#7
8. Privacy_ Security and_ ethics	8	Ch#8
9. Information Technology & Safety and health in dealing with the computer	9	Ch#9
10. Introduction to Database Systems	10	Ch#10
11. Introduction to Flowchart and Programming Languages.	11	Ch#11

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COURSE SYLLABUS

CS 1112 – DISCRETE MATHEMATICS (REQUIRED COURSE)

Course Catalog Descriptions

Introduces the foundations of discrete mathematics as they apply to computer science, focusing on providing a solid theoretical foundation for further work. Topics include introduction to logic and proofs, fundamental structures, relations, sets, Boolean algebra, propositional logic, elementary number theory, basics of counting, graphs, Tree and recurrence relations.

Course Requirements

- **Pre-requisite:** None
- **Credit Hours:** 4 CHs.
- **Contact Hours:** (4 hours lecture, 0 hours tutorial, 0 hours Lab)

References

- **Textbook:**
 - **Title:** “Discrete Mathematics and its Applications”
 - **Author(s):** Rosen, Kenneth H.,
 - **Publisher:** McGraw/ Hill.
 - **ISBN-10:** 0073383090
 - **Edition / Year:** 7th edition, 2011
- **Others:** None

Topics

Topic	Week	Reference
1. Introduction to Sets, Special sets, Finite, and infinite sets, Countable and Uncountable Sets, Venn Diagram, Operations on sets (Union, Intersection, Difference, Complements, Products and Power set), De-Morgan’s laws, Symmetric Difference. Sequences and Subsequence,	1, 2 & 3	Ch#1
2. Relations between sets and Binary Relations. Operations on Binary Relations, Types of Relations. Basic Definitions of Functions, Types of Function, Operations on Functions, Graph, Types of Graph, Degree of Graph and Adjacency Matrix for Graph, Tree.	4, 5, 6 & 7	Ch#2, Ch#3, Ch#4, Ch#5
3. Introduction to Propositional Logic, Truth and Logical Truth, Predicates and Quantification. Mathematical Induction and Recursion, Number Theory	8 & 9	Ch#6, Ch#7, Ch#8



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4. Counting Techniques, Principle of Inclusion-Exclusion, Finite Cardinality, Permutations, and Combinations	10	Ch#9
5. Binomial Theorem, Binomial Coefficients, Pascal's triangle, and their uses	11	Ch#10

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COURSE SYLLABUS

CS1301 – COMPUTER PROGRAMMING 1 (REQUIRED COURSE)

Course Catalog Descriptions

This course introduces computer programming to the students. Programming in Python with emphasis on basic program constructs: variables, assignments, operators, expressions, strings, decision structures, looping, functions, lists, dictionary, and files. Introduction to Object Oriented Programming.

Course Requirements

- **Pre-requisite:** None
- **Credit Hours:** 5 CHs
- **Contact Hours:** (3 hours lecture, 0 hour tutorial, 4 hours Lab)

References

- **Textbooks:**
 1. **Title (Main):** “Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and The Cloud”
 - **Author:** Paul Deitel, Harvey Deitel
 - **Year/Edition:** 2022
 - **ISBN-10:** 0135404673
 2. **Title (Secondary-Recommended):** “Fundamentals of Python First Programs”
 - **Author:** Kenneth A. Lambert
 - **Year/Edition:** 2019
 - **ISBN-10:** 9781337560092

Topics

Topic	Week	Reference
1. Introduction to Python Programming	1	Ch#1
2. Basic Elements of Python (variables, Data types, operators,)	1	Ch#2
3. Input/ Output Statements	2	Ch#2
4. Control Statements (if.. else, for, while)	3	Ch#3
5. Functions	4, 5	Ch#4
6. Sequences: Lists and Tuples	6	Ch#5



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7. Dictionaries, Sets, and Strings	7	Ch#6, Ch#7
8. File and Exception	8	Ch#8
9. Introduction to Object Oriented Programming	9,10 &11	Ch#9

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COURSE SYLLABUS

CE 1111 –LOGIC DESIGN (REQUIRED COURSE)

Course Catalog Descriptions

History and overview, Numbers, and conversions, Switching theory, Boolean Algebra, Combinational logic circuits, Function Optimization, Modular design of combinational circuits, Memory elements, Sequential logic circuits, Finite State Machines (FSMs) models, state diagrams, state tables, state reduction and state assignment.

Course Requirements

- **Pre-requisite:** None
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 1 hour tutorial, 0 hours Lab)

References

- **Textbooks:**
 - **Title (Main):** “Digital Design”
 - **Author:** M. Morris Mano and Michael D. Ciletti
 - **Publisher:** Pentice Hall
 - **Year/Edition:** 4th edition, 2007
 - **ISBN-10:** 9781337560092

Topics

Topic	Week	Reference
1. Numbers and conversions (Decimal, Binary, Octal, Hexadecimal)	1	Ch#1
2. Digital Arithmetic, Switching theory	2	Ch#1, Ch#2
3. Boolean Algebra (Laws and Logic Gates) ,SOP, POS	3, 4	Ch#2, Ch#3
4. Designing Combinational logic circuits using gates	5, 6	Ch#4
5. Function Optimization, Decoder, Adder, Multiplexer	7, 8	Ch#4
6. Sequential Circuit(Latches and Flip Flops)	9	Ch#5
7. Design FSM(Designing State reduction, State tables, characteristics)	10, 11	Ch#5



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COURSE SYLLABUS

CS 2301 – COMPUTER PROGRAMMING 2 (REQUIRED COURSE)

Course Catalog Descriptions

This course will introduce you to object oriented programming (OOP) using Java programming language. Emphasis will be placed on understanding not only the syntactical features of the language, but how to effectively use the design of the language to develop robust object-based software. This course provides a solid foundation of the syntax and semantics of the Java programming language used to develop real-world applications.

Course Requirements

- **Pre-requisite:** CS 1301 – Computer Programming 1
- **Credit Hours:** 5 CHs
- **Contact Hours:** (3 hours lecture, 0 hours tutorial, 4 hours Lab)

References

- **Textbook:**
 - **Title:** "Java How to Program"
 - **Authors:** Harvey Deitel, Paul Deitel
 - **Publisher:** Pearson Education
 - **Year/Edition:** 2010, Late Objects

Topics

Topic	Week	Reference
1. Introduction to Java, Java Basics	1	Ch#1, Ch#2, Ch#7, Ch#8
2. Operators and Expression	2	Ch#1, Ch#2
3. Control Structure: Selection, Repetition	3	Ch#1, Ch#2
4. Arrays	4	Ch#5,7
5. Methods	4	Ch#1,2,7,8
6. Classes and Objects: A Deeper Look	5,6	Ch#8
7. Exception Handling	7	Ch#11
8. Inheritance	8	Ch#9
9. Polymorphism	9	Ch#10
10. Interfaces	9	Ch#10
11. Abstraction and Encapsulation	10, 11	Ch#7

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CS2311 – DATA STRUCTURES (REQUIRED COURSE)

Course Catalog Descriptions

This course aims to introduce basic data structures and performance measurement of algorithms which are to be used as tools in designing solutions to problems. Topics include methods of analysis of algorithms including asymptotic notations and empirical measurements of performance, pointers and recursion, abstract data type concepts, different data structures including concepts, implementation, and operations for maintaining them; such data structures are lists and linked-lists, stacks, queues, priority queues, trees and its traversal, binary search trees, heaps, hash tables and graphs and graphs' algorithms. Also, important sorting and searching algorithms will be discussed including bubble sort, insertion sort, selection sort, merge sort, heap sort and radix sort, sequential search, and binary search.

Course Requirements

- **Pre-requisite:** CS 2301 – Computer Programming 2
- **Credit Hours:** 4 CHs
- **Contact Hours:** (3 hours lecture, 2 hours Lab)

References

- **Textbook: Title:** “Data Structures and Abstractions with Java”
 - **Author:** Frank M. Carrano
 - **Publisher:** Pearson 2015
 - **Year/Edition:** 2015

Topics

Topic	Week	Reference
1. Introduction, Algorithm analysis	1, 2	
2. Recursion	3	
3. Linked lists	4	
4. Stacks and queues	5, 6	
5. Trees	7, 8	
6. Graphs	9	
7. Hashing	10	
8. Sorting	11	
9. Searching	11	

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IS 2511– FUNDAMENTALS OF DATABASE SYSTEMS (REQUIRED COURSE)

Course Catalog Descriptions

This course provides the students with an introduction to the core concepts in data and information management. It is centered around the core skills of identifying organizational information requirements, modeling them using conceptual data modeling techniques, converting the conceptual data models into relational data models, and verifying its structural characteristics with normalization techniques, and implementing and utilizing a relational database using an industrial-strength database management system.

Course Requirements

- **Pre-requisite:**
- **Credit Hours:** 4 CHs
- **Contact Hours:** (3 hours lecture, 0 hour tutorial, 2 hour Lab)

References

- **Textbook: Title:** Fundamentals of Database Systems, Elmasri and Navathe
 - **Author:** Elmasri and Navathe
 - **Publisher:**
 - **Year/Edition:** Latest Edition
 - **Language:** English.

Topics

Topic	Week	Reference
1. Fundamentals of Database systems & environment and Information Processing	1	
2. Enterprise Data Model, Database Schema	2	
3. E-R Model Constructs and SQL Introduction	3	
4. Modeling Data in the Organization, SQL with DDL, DML & Views	4	
5. The Enhanced E-R Model	5	
6. Entity clusters and universal data model, Logical Database Design	6	
7. Data Normalization	7	
8. Physical Database Design	8	
9. Database File Organizations/ De-normalization and Partitioning	9	
10. De-normalization and Partitioning	10	
11. Introduction to SQL, select statements, View	11	

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CE 2471 – COMPUTER ARCHITECTURE AND ASSEMBLY LANGUAGE (REQUIRED COURSE)

Course Catalog Descriptions

Machine organization; assembly language: addressing modes, stacks, argument passing, arithmetic operations, decisions, performance metrics, instruction set design, instruction formats, control unit design, hardwired control, micro programmed control, instruction cycle, pipeline design techniques , memory hierarchy; cache memory and virtual memory, I/O fundamentals (handshaking and buffering) and Interrupt mechanisms, Buses (protocol arbitration, direct-memory access), super-scalar architecture, parallel architectures.

Course Requirements

- **Pre-requisite:** CE 1111
- **Credit Hours:** 4 CHs
- **Contact Hours:** (3 hours lecture, 2 hours Lab)

References

- **Textbook:**
 - **Title:** “Computer Organization and Design”
 - **Author:** David A. Patterson & John L. Hennessey
 - **Publisher:** Morgan Kauffmann
 - **Year/Edition:** 4th Edition

Topics

Topic	Week	Reference
1. Computer Organization & Architecture Introduction.	1	
2. Organization of the IBM Personal computers Data Representation and Numbering Systems.	2	
3. Number Systems & Compliments	3	
4. Overview of Assembly Language 8086	4	
5. Programs using Assembly Language	5	
6. Processor Status, Flag registers, Addressing modes	6	
7. Stacks: Stack Applications	7	
8. I/O Fundamentals Handshaking, Buffering	8	



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9. Procedures, Word processing, interrupts	9	
10. Structural data Superscalar and Parallel Architectures	10	
11. CNN and String Operations	11	

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COURSE SYLLABUS

CS 2401 – COMPUTATION THEORY (REQUIRED COURSE)

Course Catalog Descriptions

This course is an introduction to the theory of computational complexity and standard complexity classes. Topics include languages, finite and nondeterministic finite automata, Context-free grammar, Turing machines, computability, computational complexity, formal logic, and computational logic.

Course Requirements

- **Pre-requisite:** CS 1112 (Discrete Mathematics)
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 2 hours tutorial)

References

- **Textbook:**
 - **Title:** "Introduction to the Theory of Computation"
 - **Author:** Michael Sipser
 - **Publisher:** Thomson Course Technology
 - **Year/Edition:** 2012/3rd
- **Other:** None

Topics

Topic	Week	Reference
1. Introduction	1	Ch#0
2. Regular Languages	2, 3 & 4	Ch#1
3. Context-Free Languages	5, 6 & 7	Ch#2
4. The Church-Turing Thesis	8, 9	Ch#3
5. Decidability	10	Ch#4
6. Time Complexity	11	Ch#7



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CS 3001 – ETHICAL AND PROFESSIONAL PRACTICES (REQUIRED COURSE)

Course Catalog Descriptions

This course introduces students to the social and professional issues that arise in the context of computing. Topics include history of computing, social context, impact of computing on society, analytical tools, professional ethics, governance and regulation, risks, security operations, intellectual property, privacy and civil liberties, computer crime, economics of computing, professional responsibility and philosophical frameworks.

Course Requirements

- **Pre-requisite:** None
- **Credit Hours:** 3 hrs
- **Contact Hours:** (2 hours lecture, 0 hour tutorial, 0 hour lab)

References

- **Textbook:**
 - **Title:** "Ethics in Information Technology"
 - **Author:** George Reynolds
 - **Publisher:** Course Technology Inc., (ISBN-10: 1285197151, ISBN-13: 978-1285197159)
 - **Year/Edition:** 2015/5th Edition

Topics

Topic	Week	Reference
1. An Overview of Ethics	1, 2 & 3	Ch#1
2. Ethics for IT Workers and IT Users	4, 5 & 6	Ch#2
3. Computer and Internet Crime	7, 8	Ch#3
4. Privacy	9,	Ch#4
5. Intellectual Property	10	Ch#6
6. Software Development	11	Ch#7

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CS 3761 – COMPUTER NETWORK SYSTEMS (REQUIRED COURSE)

Course Catalog Descriptions

Network architecture: network topologies, analog and digital transmission, modulation and demodulation, transmission media, data encoding, synchronous and asynchronous transmission, digital carriers, access methods and multiplexing, circuit and packet switching. OSI model, LANs, internetworking devices; high-speed bridged networks; WANs .Introduction to Internet and TCP/IP, client-server architecture, socket programming, TCP and UDP, congestion control, addressing, routing algorithms, framing, flow and error algorithms.

Course Requirements

- **Pre-requisite:** CE 2471
- **Credit Hours:** 4 hrs
- **Contact Hours:** (4 hours lecture)

References

- **Textbook:**
 - **Title:** "Computer Networks "
 - **Author:** Andrew S. Tanenbaum & David J. Wetherall
 - **Publisher:** Prentice Hall
 - **Year/Edition:** 5th edition, 2010

Topics

Topic	Week	Reference
1. Introduction to Computer Networks, Network topologies, Digital transmission	1	Ch#1
2. Modulation and demodulation ,Digital carriers	2	Ch#2
3. Access methods and multiplexing	3	Ch#3
4. Circuit and packet switching, OSI model: DNS	4	Ch#4
5. Communication protocols, TCP and UDP	5	Ch#6
6. SMPT, FTP, WWW, socket programming	6	Ch#7
7. Congestion control Internetworking, addressing	7	Ch#8
8. Routing algorithms framing, flow and error algorithms	8	Ch#9
9. PPP, MAC local area networks;	9	Ch#10
10. Internetworking devices; high-speed bridged networks	10	Ch#11
11. Wide area networks; Internet and TCP/IP, Client-server architecture	11	Ch#12, Ch#13

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COURSE SYLLABUS

CE 3791 – COMPUTER NETWORKS SYSTEMS LAB (REQUIRED COURSE)

Course Catalog Descriptions

A set of experiments to design, apply, analyze, and evaluate communication network protocols. employ knowledge to identify a problem, propose alternative solutions, implement a prototype using available network protocols, and evaluate the results. troubleshooting different network issues, and final project is given that will be evaluated at the end of the laboratory.

Course Requirements

- **Pre-requisite:** CE 3761
- **Credit Hours:** 2 hrs
- **Contact Hours:** (4 hours lab)

References

- **Textbook:**
 - **Title:** Lab Manual

Topics

Topic	Week	Reference
1. Study of different types of Network cables and practically implement The cross-wired cable and straight through cable using clamping tool. Study of Network Devices in Detail and Study of network IP	1	
2. Connect the computers in Local Area Network	2	
3. Networking (Router Configuration) - Configuration of routers in a network. Installation of Cisco Packet Tracer software	3	
4. Internet Protocol: private internet protocol using routers, switches, cloud and server (wired and Wi-Fi) (cisco tool).	4	
5. DSL connection internet protocol using routers, switches, cloud and server (wired and Wi-Fi) (cisco tool).	5	
6. Design and analysis Bus, Ring, Star, Mesh, Tree and Hybrid Topology	6	
7. Performing an Initial Switch Configuration in Packet Tracer	7 & 8	
8. LAN Simulation: Client Server Architecture with Switch Configuring HTTP, FTP, EMAIL and DNS clients with server	9	
9. Design, apply, analyze, and evaluate communication network protocols for the following and perform Ping, Tracert/ Trace Route, Ipconfig/ ifconfig, Netstat, Nslookup, Pathping/MTR, and Route. Home Area Network, Small Office Network, Campus Area Network, Bank Network, Company Network	10 & 11	

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CS 3101- SEMINAR IN UNDERGRADUATE ADVANCED RESEARCH (REQUIRED COURSE)

Course Catalog Descriptions

This course gives an introduction of research terminology, ethics, and techniques, this course will give participants the chance to create or enhance their understanding of research. The research language, ethical concepts and issues, and the components of the research process using quantitative, qualitative, and mixed methods approaches are all covered in this course. These theoretical foundations will be used by participants to start reviewing literature critically in their field or area of interest and figuring out how research findings may help them better understand their environment at work, in society, locally, and globally.

Course Requirements

- **Pre-requisite:**
- **Credit Hours:** 2 CHs
- **Contact Hours:** (2 hours lecture, 0 hours tutorial, 0 hours Lab)

References

- **Textbook:**
 - **Title:** Projects in Computing and Information Systems A Student's Guide
 - **Author:** Christian W. Dawson
 - **Publisher:** Pearson
 - **Year/Edition:** 2015

Topics

Topic	Week	Reference
1. Introduction to Research	1	Ch#1
2. Definition and Methods of Research	2	Ch#2
3. Choosing a project and writing a proposal	3, 4	Ch#3
4. Project planning and risk management	5, 6	Ch#4
5. Literature searching and literature reviews	7, 8	Ch#5
6. Controlling your Project	9	Ch#7
7. Presenting your Project in written form	10	Ch#8
8. Presentation skills	11	Ch#9

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COURSE SYLLABUS

CS 3401 – ALGORITHMS DESIGN AND ANALYSIS (REQUIRED COURSE)

Course Catalog Descriptions

This course introduces formal techniques to support the design and analysis of algorithms, focusing on both the underlying mathematical theory and practical considerations of efficiency. Topics include correctness of algorithms, asymptotic notation, recurrences, and Master theorem, divide and conquer, transform and conquer (Balanced Trees), time-space trade-offs, median and order statistics, searching and sorting algorithms, dynamic programming, greedy algorithms, randomized algorithms, recursive backtracking, computational geometry, string matching. Optional material: NP-completeness, competitive analysis, branch-and-bound, amortized analysis and approximation algorithms.

Course Requirements

- **Pre-requisite:** CS 2311 (Data Structures)
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture)

References

- **Textbook:**
 - **Title:** "Introduction to the Design and Analysis of Algorithms"
 - **Author:** Anany V. Levitin
 - **Publisher:** Pearson
 - **Year/Edition:** 2011/3rd

Topics

Topic	Week	Reference
1. Introduction and mathematical background	1	Ch#1
2. Asymptotic analysis	2	Ch#2
3. Brute Force & Exhaustive Search	3, 4	Ch#3
4. Decrease & Conquer & Sorting and order statistics	5	Ch#4
5. Divide and conquer and Randomized algorithms	6	Ch#5
6. Transform & Conquer	7, 8	Ch#6
7. Space-Time Trade-offs, String matching	9	Ch#7, Ch#8
8. Dynamic programming and Greedy algorithms	10	Ch#9
9. Optional Topics: NP-completeness,	11	Sec# 11.3,
10. Backtracking, branch-and-bound, approximation algorithms and amortized analysis.		12.1-12.3, 2.1, 9.2

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CS 3501 – INTRODUCTION TO ARTIFICIAL INTELLIGENCE (REQUIRED COURSE)

Course Catalog Descriptions

This course introduces students to the fundamental concepts and techniques of artificial intelligence. Topics include fundamental issues, agents, solving problems by searching, informed search and exploration, constraint satisfaction problems, knowledge representation and reasoning, advanced search, advanced knowledge representation and reasoning, production rule systems, planning, and uncertainty.

Course Requirements

- **Pre-requisite:** CS 2311 – Data Structure
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hour Lab)

References

- **Textbooks:**
 - **Title (Main):** “Artificial Intelligence: A Modern Approach”
 - **Author:** Peter Norvig and Stuart J. Russell
 - **Year/Edition:** 3rd
 - **ISBN-10:** 0-13-604259-7

Topics

Topic	Week	Reference
1. Introduction to AI and its Applications	1	Ch#1
2. Intelligent Agents	2	Ch#2
3. Problem solving by Search Techniques	3, 4	Ch#3
4. Knowledge Representation – First-Order Logic	5, 6	Ch#8
5. Knowledge Representation – Inference in First-Order Logic	7, 8	Ch#9
6. Adversarial Search and Game Playing	9	Ch#5
7. Reasoning with Uncertainty (Bayes’ Theorem)	10, 11	Ch#13

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CS 3701 – OPERATING SYSTEMS (REQUIRED COURSE)

Course Catalog Descriptions

This course aims to introduce the fundamentals of operating systems design and implementation. Topics include an overview of the modern operating system's basic concepts, the major components of an operating stem, process management and scheduling, thread Control and Signals, mutual exclusion and synchronization, deadlock, memory management and virtual machine.

Course Requirements

- **Pre-requisite:** CS 2311 – Data Structures
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hours Lab)

References

- **Textbook:**
 - **Title:** " Operating System Concepts "
 - **Author:** Abraham Silberschatz , Peter Baer Galvin and Greg Gagne
 - **Publisher:** John Wiley & Sons
 - **Year/Edition:** 10th Edition - 2018
- **Others:** Progressively on the university E-learning system (blackboard)

<https://elearning.psau.edu.sa/>

<https://www.os-book.com/OS10/>

Topics

Topic	Week	Reference
1. Introduction to Modern Operating Sys.	1	Ch#1
2. System Structure	2	Ch#2
3. Process and Threads	3	Ch#3
4. CPU Scheduling	4, 5	Ch#4
5. Deadlocks	6,7	Ch#5
6. Memory management	8, 9	Ch#6
7. Virtual memory	10, 11	Ch#7

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CS 3801 – FUNDAMENTALS OF CYBERSECURITY (REQUIRED COURSE)

Course Catalog Descriptions

This course introduces the computer security principles and the basic threats and countermeasures of security problems in computing environments. This module includes: Model and attacks, security services (confidentiality, integrity, non-repudiation, availability, accountability), Cryptography: symmetric-key and Asymmetric-key cryptography, authentication and digital signature, key management and cryptographic protocol, access control and authentication, security in computer networks, intrusion detection, viruses and other forms of malicious code.

Course Requirements

- **Pre-requisite:** IS 2511
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hour Lab)

References

- **Textbook:**
 - **Title:** “Computer Security Principles and Practice”
 - **Author:** William Stallings and Lawrie Brown
 - **Publisher:** Pearson Education
 - **Year/Edition:** 2014
 - **Language:** English
 - **ISBN-10:** 0133773922 **ISBN-13:** 978-0133773927
- **Others:**
 - **Title:** “Cryptography and Network Security”
 - **Author:** William Stallings
 - **Publisher:** Pearson Education
 - **Year/Edition:** 2010

Topics

Topic	Week	Reference
1. Introduction to Security.	1	Ch#1
2. Classical Encryption Techniques.	2,3	Ch#2



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3. Symmetric Encryption.	3,4	Ch#3
4. Public-key Cryptosystems.	5	Ch#4
5. Message Authentication and Hash Functions.	6	Ch#5
6. Digital Signature and Key Management.	7, 8	Ch#6
7. User Authentication	9	Ch#7
8. Access Control.	10	Ch#8
9. Network Security	11	Ch#9

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COURSE SYLLABUS

CS-3821- WEB APPLICATIONS PROGRAMMING (REQUIRED COURSE)

Course Catalog Descriptions

This course aims to provide students with knowledge and skills to develop web applications. Students will learn the concepts of client-side and server-side programming, the fundamentals of the Web, implementation of web applications with database Interfaces. This course is designed to give the student the tools and the knowledge to program using the web programming language PHP as a server side language. Students will be able to use HTML, XHTML, CSS, JavaScript, XML, PHP, MYSQL to develop a dynamic web application.

Course Requirements

- **Pre-requisite:** IS 2511
- **Credit Hours:** 4 CHs
- **Contact Hours:** (3 hours lecture,2 hours Lab)

References

- **Textbook:**
 - **Title:** “PHP and MySQL Web Development (5th Edition)”
 - **Author:** Luke Welling and Laura Thomson
 - **Publisher:** Addison-Wesley Professional
 - **Year/Edition:** 2017 / 5th Edition |**ISBN-13:** 9780321833891
- **Others:**
 - **Title:** “Programming the World Wide Web”, Robert W. Sebesta, University of Colorado, Colorado Springs, Pearson 2015.
 - PHP and MySQL Web Development (5th Edition) (Developer's Library), Luke Welling and Laura Thomson, Addison-Wesley Professional, 2016.
 - W3Schools online web tutorial, www.w3schools.com
 - <https://elearning.psau.edu.sa/> **Blackboard university portal**

Topics

Topic	Week	Reference
1. Introduction: Web Programming and Scripting	1	Ch#1
2. Web browsers, servers and HTTP	2	Ch#2
3. HTML basics and more advanced XHTML	3	Ch#3, Ch#4



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4. CSS examples and HTML5 features	4, 5	Ch#5, Ch#6
5. The Basics of JavaScript	5, 6	Ch#7
6. JavaScript: DOM and Dynamic HTML	7	Ch#7
7. PHP Basics	8, 9	Ch#8
8. More PHP: Form Handling, Files, Cookies, Session Tracking, Architectures for Database Access, The MySQL Database System, Database Access with PHP/MySQL	10	Ch#9
9. Web Application Frameworks, Introduction to webserver	11	Ch#10

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COURSE SYLLABUS

SE 1010 – EMERGING DIGITAL TECHNOLOGIES (REQUIRED COURSE)

Course Catalog Descriptions

This course covers the concept of emerging digital technologies and its operational principles and it's in and for the design of the built environment.

At the successful completion of this course, you will be able to:

- comprehend the technical and operational principles of emerging digital technologies.
- Demonstrate skills in operating emerging digital technologies.
- Identify application of emerging digital technologies.
- Apply emerging digital technologies in their own design projects and professional work.

Course Requirements

- **Co-requisite:**
- **Credit Hours:** 2 CHs
- **Contact Hours:** (2 hours' lecture)

References

- **Textbook:**
 - **Title:** "Digital transformation using emerging technologies"
 - **Author:** Fawad A. Khan and Jason M. Anderson
 - **Publisher:**

Topics

Topic	Week	Reference
1. Introduction to Emerging Technologies	1	
2. Machine Learning (ML) - Introduction , Applications of ML	2	
3. Artificial Intelligence (AI) - History, Level of AI, Types of AI	3	
4. Artificial Intelligence (AI) - Influencers of AI, Applications of AI	4	
5. Internet of Things (IoT) & 5G - Introduction, Architecture	5	
6. Internet of Things (IoT) & 5G - IoT tools & Platforms & Applications	6	
7. Augmented Reality (AR) - Overview of AR, Differentiation between VR, AR & MR	7	
8. Augmented Reality (AR), Architecture of AR, Applications of AR	8	
9. Additive manufacturing	9	
10. Blockchain Technology & Applications	10	
11. Ethics & Professionalism of Emerging Technologies	11	



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COURSE SYLLABUS

CS 4311 – ADVANCED PROGRAMMING (REQUIRED COURSE)

Course Catalog Descriptions

It introduces students to the advanced object-oriented topics. Topics include graphical user interface (GUI) components, event-driven programming (event-handling methods, event propagation, exception handling), application programming interfaces (APIs), layout managers, graphics using 2D, applets, multimedia, threads, networking with sockets, and Java database connectivity (JDBC).

Course Requirements

- **Co-requisite:** CS 2301
- **Credit Hours:** 4 CHs
- **Contact Hours:** (2 hours' lecture, 4 hours Lab)

References

- **Textbook:**
 - **Title:** "Java How to Program"
 - **Author:** Paul Deitel, Harvey Deitel
 - **Publisher:** Pearson Education
 - **Year/Edition:** 10th Ed., 2014
- **Others:** None

Topics

Topic	Week	Reference
1. GUI components – Part I.	1, 2	Ch#14
2. Event handling.	3,	Ch#14
3. Graphics and Java 2D.	4, 5	Ch#15
4. GUI components – Part II.	6	Ch#14
5. Accessing Databases with JDBC.	7, 8	Ch#28
6. Multithreading.	9,	Ch#26
7. Networking.	10, 11	Ch#27

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COURSE SYLLABUS

CS 4321 – PROGRAMMING LANGUAGES AND COMPILERS (REQUIRED COURSE)

Course Catalog Descriptions

This course gives an introduction of programming languages features and design issues and the methods used in compilers to translate high-level programming languages into machine code. This module include Programming language features and design issues; Data, operands and operators, expressions, statements, and subprograms, lexical analysis, syntax analysis, syntax-directed translation, type checking, run-time environments, intermediate code generation, and code generation. The students are expected to write a complete compiler for a very simple high level programming language.

Course Requirements

- **Pre-requisite:** CS2401 – Computation Theory
- **Credit Hours:** 4 CHs
- **Contact Hours:** (3 hours lecture, 0 hour tutorial, 2 hours Lab)

References

- **Textbook:**
 1. **Title:** "Concepts of Programming Languages"
 - **Author:** Robert W. Sebesta
 - **Publisher:** Addison-Wesley, (ISBN-10: 013394302X, ISBN-13: 978-0133943023)
 - **Year/Edition:** 2016/11th E
 2. **Title:** "Compilers: Principles, Techniques and Tools"
 - **Author:** Aho A., R.Sethi, J.Ullman
 - **Publisher:** Addison-Wesley, (ISBN-10: 0321486811, ISBN-13: 978-0321486813)
 - **Year/Edition:** 2007/2nd Ed.

Topics

Topic	Week	Reference
1. Programming languages - Syntax and Semantics	1	TB1 Ch#1, Ch#3
2. Introduction to Compilers Construction	2	TB2 Ch#1, Ch#2
3. Lexical Analysis	3, 4	TB2 Ch#3
4. Syntax Analysis	5, 6, 7, 8	TB2 Ch#4
5. Syntax-Directed Translation	9	TB2 Ch#5
6. Intermediate-Code Generation	10, 11	TB2 Ch#8
7. Compiler construction tools	1 - 11	Lab Manual

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COURSE SYLLABUS

CS 4551- MACHINE LEARNING (REQUIRED COURSE)

Course Catalog Descriptions

Definition and examples of machine learning, inductive learning, statistical based learning, reinforcement learning, supervised learning, unsupervised learning, learning decision trees, neural networks, belief networks, nearest neighbor algorithm, clustering, learning theory, the problem of overfitting, and computational learning theory.

Course Requirements

- **Pre-requisite:** CS 3501
- **Credit Hours:** 4 CHs
- **Contact Hours:** (3 hours lecture, 0 hour tutorial, 2 hours Lab)

References

- **Textbook:**
 - **Title:** Introduction to Machine Learning
 - **Author:** Ethem Alpaydin
 - **Publisher:** MIT
 - **Year/Edition:** 2014/3rd Edition
- **Others:**
 - **Title:** Machine Learning
 - **Author:** Tom Mitchell
 - **Publisher:** McGraw Hill
 - **Year/Edition:** 1997

Topics

Topic	Week	Reference
1. Introduction to ML (supervised, unsupervised)	1	
2. Linear Regression with One Variable	2	
3. Linear Regression with Multiple Variables	3	
4. Logistic Regression	4	
5. Regularization	5	
6. Support Vector Machines	6	
7. Decision Trees	7	
8. KNN	8	
9. Neural Networks: Representation, Learning, MLP	9	
10. Model Assessment and Comparison	10	
11. Unsupervised Learning, Clustering, k-means	11	

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المرفقات:

COURSE SYLLABUS

CS 4654 – DIGITAL IMAGE PROCESSING (REQUIRED COURSE)

Course Catalog Descriptions

This course covers the fundamentals of computer graphics and digital image processing. Course topics are the fundamentals of computer graphics, introduction of image sensing and acquisition, some basic gray level transformations for image enhancement, image contrast enhancement using histogram processing, image smoothing using spatial filters, image sharpening using spatial filters, point, line and edge detection, basic global and adaptive thresholding for image segmentation, optimal global and adaptive thresholding for image segmentation, region-based image segmentation and edge-based segmentation, image restoration in the presence of noise-spatial filtering, image enhancement.

Course Requirements

- **Pre-requisite:** CS 3401
- **Credit Hours:** 4 CHs
- **Contact Hours:** (3 hours lecture, 2 hours Lab)

References

- **Textbook:**
 - **Title:** “Digital image processing”
 - **Author:** Rafael C Gonzalez and Richard E Woods
 - **Publisher:** New York, NY : **Pearson**
 - **Year/Edition:** 2018 / 4th Edition |ISBN-13 978-0133356724
- **Others:**
 - Space Image Processing, Julio Sanchez, CRC Press, 2018.
 - Computing Color Image Processing, Alan Parkin, Springer International Publishing, 2018.
 - Adaptive Image Processing, Kim-Hui Yap; Ling Guan; Stuart William Perry;Hau San Wong,CRC Press, 2018
 - Matlab: <https://www.mathworks.com/products/matlab.html>

Topics

Topic	Week	Reference
1. Fundamentals of computer graphics	1	Ch#1
2. Introduction to Image Processing	2	Ch#1
3. Histograms	2,3	Ch#2
4. Point Operations	4	Ch#2, Ch#3



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5. Filters	5	Ch#3, Ch#4
6. Edges and Contours	6	Ch#4, Ch#5
7. Corner Detection	7	Ch#5
8. Morphological Filters	8,9	Ch#6
9. Regions in Binary Images	10	Ch#7, Ch#8
10. Color Images Processing	11	Ch#8

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COURSE SYLLABUS

CS 4961– ADVANCED DATABASE SYSTEMS (REQUIRED COURSE)

Course Catalog Descriptions

Students should be able to move on to more advanced database topics after taking the first “Fundamentals of Database Systems” course. Advanced Database course is a study of many advanced data models such as: object-oriented model: object-relational model. Parallel and distributed database. Transaction ACID properties and concurrency control. Database backup and recovery. Query processing and optimization. Homogeneous and heterogeneous solution based on XML. By the end of this course the students should have an adequate understanding on temporal Database, Intelligent Database, query optimization and data warehouse. The topics that are covered in this course help the student to be more skillful in managing normal, distributed, light and huge queries. This will prove the students’ skills progress further in Computer Science.

Course Requirements

- **Pre-requisite:** IS-2511
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hour Lab)

References

- **Textbook: Title:** “Database System Concepts”
 - **Author:** Abraham Silberschatz, Henry F.Korth and S.Sudarshan.
 - **Publisher:** McGraw Hill Book Company
 - **Year/Edition:** 2006/ 6th Edition
- **Others:** An Introduction to DataBase System, 6th edition, Addison- Wesley Publishing Company, 1995, by C.J. Date.
 - Fundamentals of Database Systems,4th ed.,Addison Wesley Publishing, Elmasri & Navathe.

Topics

Topic	Week	Reference
1. Fundamentals of Database systems & environment & Database models.	1	
2. Basics of Object-Oriented concepts	2	
3. Object-Oriented Databases	3	
4. Object-Relational model	4, 5	
5. Parallel and distributed database	6	
6. Transaction ACID properties and concurrency control	7	
7. Database Backup and Recovery	8	
8. Query processing and optimization	9	
9. Homogeneous and Heterogeneous solution based on XML	10, 11	

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COURSE SYLLABUS

CS 4841 – PARALLEL AND DISTRIBUTED COMPUTING (REQUIRED COURSE)

Course Catalog Descriptions

This course extends the study of the design and implementation of operating systems to distributed and advanced computer systems. Topics include introduction to distributed systems and models, networking and internetworking essentials, overview of network programming, distributed computing technologies and middleware, distributed operating systems, distributed algorithms, distributed databases, distributed applications, and case study and selected advanced topics.

Course Requirements

- **Pre-requisite:** CS-3701
- **Credit Hours:** 4 CHs.
- **Contact Hours:** (4 hours lecture, 1 hours tutorial, 0 hours Lab)

References

- **Textbook:**
 - **Title:** “Distributed Systems: Concepts and Design”
 - **Author:** George Coulouris, Jean Dollimore, Tim Kindberg, Gordon Blair.
 - **Publisher:** Addison-Wesley Pearson Education
 - **ISBN 10:** 0-13-214301-1 **ISBN 13:** 978-0132143011
 - **Year/Edition:** 2021 / 5th Edition
 - "Distributed Systems: Principles and Paradigms" by ,Andrew S. Tanenbaum, and Maarten Van Steen
- **Others:** -
 - Understanding Distributed Systems: What every developer should know about large distributed applications by Roberto Vitillo, Published 2021.
 - Understanding Distributed Systems, Second Edition: What every developer should know about large distributed applications by Roberto Vitillo, Published 2022

Topics

Topic	Week	Reference
1. Characterization of distributed systems	1, 2	Ch#1
2. System Models	3, 4	Ch#1, 2



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3. Networking and internetworking	5, 6	Ch#1, 2, 3
4. Distributed computing technologies and middleware	7	Ch#1, 2, 3, 4
5. Distributed operating systems	8	Ch#1, 2, 3, 4
6. Distributed algorithms	9	Ch#1, 2, 3, 4, 5
7. Distributed database system	10	Ch#1,2 ,3,4,5,6
8. Distributed Application, Case Study	11	Ch#1, 2, 3, 4,5,6,7, 8



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COURSE SYLLABUS

CS 4901 – FIELD TRAINING (REQUIRED COURSE)

Course Catalog Descriptions

This course aims at allowing student to acquire experience in a public/private sector in the field of computer science. This is accomplished in full time schedule for at least 8 weeks in summer. The ultimate aim of the training is that student will apply what he learned during previous years. This is done in a real life and in teamwork environment. The training is evaluated according to training advisor at the training field and the training committee at the department of computer science.

Courses, Professional Certificates, Technical Training Camps are all acceptable as alternative to Field Training during summer 2022.

Course Requirements

- **Pre-requisite:** Completion of 130CHs
- **Credit Hours:** 3 CHs.
- **Contact Hours:** 8 hours a day and 5 days a week for 8 weeks; 320 hours of training courses

References

- **Textbook:**
 - **Title:** “Training Manual”
 - **Author(s):** CCES Training Committee
 - **Publisher:** CCES, PSAU
 - **Year/Edition:** 2016 - 2017
- **Others:** None



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COURSE SYLLABUS

CS 4912 – GRADUATION PROJECT 1 (REQUIRED COURSE)

Course Catalog Descriptions

The aim of the project is to integrate the theoretical and practical knowledge of the student across all the years of their study and provide a practical demonstration of their capability in executing a challenging and large-scale project.

Course Requirements

- **Pre-requisite:** CS 3101
- **Credit Hours:** 3 CHs.
- **Contact Hours:** 3 hours



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COURSE SYLLABUS

CS 4921 – GRADUATION PROJECT 2 (REQUIRED COURSE)

Course Catalog Descriptions

In this course, the student is expected to deliver a detailed report including all the software development phases; the algorithms; or models. The student must be discussed in a seminar and in the presence of arbitrators.

Course Requirements

- **Pre-requisite:** CS 4912
- **Credit Hours:** 3 CHs.
- **Contact Hours:** 3 hours

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COURSE SYLLABUS

CS 4821 – CRYPTOGRAPHY (ELECTIVE)

Course Catalog Descriptions

Introduction to number theory: modular arithmetic, prime number, Fermat's and Euler's Theorems, testing for Primality, Chinese Remainder Theorem, Integer Factorization, Discrete logarithms, Set algebra and finite fields. Computations in finite fields using standard and non-standard bases. High performance algorithms and architectures for cryptographic applications. Cryptographic algorithms: Classical cryptography; Secret Key Encryption; Perfect Secrecy. Cryptanalysis; Block and Stream cipher; Data Encryption Standard (DES) and Advanced Encryption Standard (AES); Public Key Encryption; Diffie-Hellman Key Exchange; RSA, ElGamal and Rabin's Cryptosystems; Authentication and Digital Signatures; One-time signatures; Randomized Encryption; Rabin and ElGamal signature schemes; Digital Signature Standard (DSS) Cryptographically. Identification and entity authentication. Hash algorithms, Message Authentication Codes. Key establishment protocols. Key management Techniques.

Course Requirements

- **Pre-requisite:** CS-3801
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hour Lab)

References

- **Textbook:**
 - **Title:** Cryptography and Network Security: Principles and Practices
 - **Author:** William Stallings,
 - **Publisher:** Prentice Hall
 - **Year/Edition:** 5th Edition, 2010 or latest available edition **Language:** English
- **Others:**
 - **Title:** Handbook of Applied Cryptography
 - **Author:** Menezes, Oorschot and Vanstone
 - **Publisher:** CRC Press
 - **Year/Edition:** 2014 (last update) **Language:** English

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Topics

Topic	Week	Reference
1. Introduction to number theory: Prime numbers, Euler's totient function, Modular arithmetic (divisors, operations, and properties of congruence), Euclidean algorithm: finding GCD, Finding inverse (Exhaustive search, Fraction, and Extended Euclidean algorithms)	1, 2	Textbook- Ch# 1 Ch# 2
2. Cryptography, Classical Cryptosystems, Cryptanalysis, and Perfect secrecy	3, 4	Textbook – Ch#3, Ch#4
3. Data Encryption Standard (DES) and Advanced Encryption Standard (AES)	5, 6	Online latest Information (Multiple Resources)
4. Public Key Encryption: RSA, Diffie-Hellman, ElGamal, ID system and Rabin's Cryptosystems	7, 8	Online latest Information (Multiple Resources)
5. Public Key Digital Signatures: Digital Signature Standard (DSS), Shamir Signature Knapsack and Fayoumi Signature	9	Online latest Information (Multiple Resources)
6. Secure hash, Security of Hash functions, Secure Hash algorithm (SHA)	10	Information (Multiple Resources)
7. Authentication applications: challenge-response mechanism	11	Information (Multiple Resources)

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COURSE SYLLABUS

SE 4141– ADVANCED SOFTWARE ENGINEERING (ELECTIVE)

Course Catalog Descriptions

Design patterns - Distributed systems architecture - Real-time software design – Data acquisition systems – Data processing systems – Transaction processing systems – Event processing systems.

Course Requirements

- **Pre-requisite:** CS 3101
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hour Lab)

References

- **Textbook:**
 - **Title:** Software Engineering"
 - **Author:** Ian Sommerville
 - **Publisher:** Pearson Education
 - **Year/Edition:** 8th Edition" or Latest Edition

Topics

Topic	Week	Reference
1. Overview of Software Engineering, Introduction to Architectural Designs, Models Sub Topics: System structuring , Control models	1	Ch#1, 2
2. Architectural Designs, Models (continued..) Sub Topics: Domain-specific architectures, Modular decomposition	2	Ch#1, 2
3. Design patterns- Design with Reuse Sub Topics: Component-based development	3	Ch#1, 2,3
4. Design patterns- Design with Reuse Sub Topics: Application families, Design patterns	4	Ch#1, 2,3
5. Distributed systems architecture Sub Topics: Multiprocessor architectures, Client-server architectures	5	Ch#1, 2,3,4
6. Distributed systems architecture Sub Topics: Distributed object architectures, Inter-organizational computing	6	Ch#1, 2,3,4
7. Real-time software design: Introduction Real-Time Systems (RTS): A Characterization, RTS Design	7	Ch#1, 2,3,4,5
8. Real-time software design: RT Operating Systems Generic RTS architectures	8	Ch#1, 2,3,4,5



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9. Monitoring and Control Systems Real-time software design: Data Acquisition Systems	9	Ch#1, 2,3,4,5
10. Application Architectures: Data Processing systems Application Architectures: Transaction Processing systems	10	Ch#1, 2,3,4,5,6
11. Application Architectures: Event Processing systems, Activity	11	Ch#1, 2,3,4,5,6

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COURSE SYLLABUS

SE 2111– SOFTWARE ENGINEERING (REQUIRED COURSE)

Course Catalog Descriptions

Principles of software engineering: basic understanding of software life cycle Requirements, design and testing. Review of principles of object orientation. Object oriented analysis using UML. Frameworks and APIs., basic modeling and design; basic of project management, software cost estimation, configuration management, and testing.

Course Requirements

- **Pre-requisite:** IS 2511
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hour Lab)

References

- **Textbook:**
 - **Title:** Software Engineering",
 - **Author:** Ian Sommerville,
 - **Publisher:** Pearson Education
 - **Year/Edition:** 8th edition" or Latest Edition

Topics

Topic	Week	Reference
1. Introduction to SE, Water Model Phases	1	
2. Software Process Domains	2	
3. Agile Software Development, Prepare Software Requirement Specification	3	
4. Requirement Engineering, Requirements Analysis, System Modeling	4	
5. Data Flow Diagrams, Architecture Design, Entity Relation diagrams	5	
6. Design and Implementation, UML: Software Testing, Software Evolution	6	
7. Use Case Diagrams, System Dependability and Security	7	
8. Sequence Collaboration, Software Management / Project Management	8	
9. Activity Diagram, Class-Object	9	



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10. Project Planning and Quality Management, Configuration Management	10	
11. Introduction to Software testing, Software maintenance & Software legacy systems, Testing, Activity	11	

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التاريخ:

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COURSE SYLLABUS

CS 4531– NEURAL NETWORKS (ELECTIVE)

Course Catalog Descriptions

In this course students will learn about the basics of deep neural networks, and their applications to various AI tasks. By the end of the course, it is expected that students will have significant familiarity with the subject, and be able to apply Deep Learning to a variety of tasks. They will also be positioned to understand much of the current literature on the topic and extend their knowledge through further study.

Course Requirements

- **Pre-requisite:** CS 3501
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hour Lab)

References

- **Textbook:**
 - **Title:** *Deep Learning*
 - **Author** Ian Goodfellow, Yoshua Bengio, and Aaron Courville
 - **Publisher:**
 - **Year/Edition:** Latest Edition

Topics

Topic	Week	Reference
1. Introduction, Syllabus, Machine Learning review	1	CH# DLB 1-5
2. Deep Feedforward, Activation Functions	2	CH# DLB 6
3. Optimization, Training, Regularization	3	CH# DLB 7,8
4. Convolutional Neural Networks	4, 5	CH# DLB 9
5. Recurrent Neural Networks	6, 7	CH# DLB 10
6. Generative Adversarial Networks	8	CH# DLB 20.10.4
7. Reinforcement Learning	9	--
8. Transformers	10	--
9. <u>Practical Methodology</u> , Metrics, Hyperparameters Deep learning applications and trends	11	CH# DLB 11

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COURSE SYLLABUS

CS 4731– SYSTEM PROGRAM AND ADMINISTRATION (ELECTIVE)

Course Catalog Descriptions

This course provides experience with the administration and programming of some popular OS, e.g. Linux or MS Windows. Topics include basic shell commands and utilities, shell scripting and GUI tools for user management, file system management, management of security policies, network services and background processes, web-based administration tools for remote administration.

Course Requirements

- **Pre-requisite:** CS 3701
- **Credit Hours:** 4 CHs
- **Contact Hours:** (4 hours lecture, 0 hour tutorial, 0 hour Lab)

References

- **Textbook:**
 - **Title:** Advanced programming in the UNIX environment
 - **Author:** W. Richard Stevens, Stephen A.Rago. Addison Wesley
 - **Year/Edition:** Latest Edition

Topics

Topic	Week	Reference
1. Introduction to System Administration	1	
2. Introduction to Microsoft Windows -7 (Editions, Features, Architecture)	2	
3. File Management (Configuring File Systems, Configuring Disk Storage)	3	
4. File Management (Accessing and Managing the Disk Management Utility, Managing Data Compression, Using Disk Maintenance Tools)	4	
5. Managing the Interface (Control Panel, System Icon, Registry Editor)	5	
Configuring Users and Groups (understanding windows 7 user accounts, Create, Disable, Renaming, Deleting)	6	
6. Configuring Users and Groups (Managing user properties, troubleshooting user authentication, Creating & Managing Groups)	7	
7. Managing Security (Managing Security Configurations, Understanding Group Policy Objects and Active Directory)	8	
8. Managing Security (Managing File & Folder Security, Managing Network Access)	9	
9. PowerShell (commands, errors) & Shell Scrips	10, 11	



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المرفقات:

- **Committee:** Computer Science Department Council
- **Reference No. :** 07
- **Date:** 13/11/2022