

3rd YEAR EVEN SEMESTER

CSE 3200

Software Development Project II

Prerequisite: None

Students will Work in Groups or Individually to Develop High Quality Software/Projects Including New I/O Drivers or Similar Projects Involving Operating Systems Modules in Different Types of Data Base Systems or Project Oriented and Visual Languages, Students will Writes Structure Program and use Proper Documentation.

Contact Hours/week: 3/2

Credits: 0.75

CSE 3201

Operating Systems

Prerequisite: None

Introduction to Operating System: Operating System Concepts, its Role in Computer Systems, Computer System Structure, Fundamental of Different Types of Computer System, Operating System Structure and Operation, Protection and Security.

Process Management: Process Concept, Model and Implementation, Process State, Process Scheduling, Inter-Process Communication (IPC), Multiprocessing and Timesharing, Interaction between Process and Operating System; CPU Scheduling: Scheduling Concepts, Scheduling Criteria, Scheduling Algorithms (SJF, FIFO, Round Robin, etc.).

Memory Management: Memory Portioning, with and without Swapping, Virtual Memory –Paging and Segmentation, Demand Paging, Page Replacement Algorithms, Implementation.

File Systems: FS Services, Disk Space Management, Directory and Data Structures;

Deadlocks and Case Study: Modeling, Detection and Recovery, Prevention and Avoidance; Case Study of Some Operating Systems.

Others: Introduction to the Different Smart Device Operating System and their Usage.

Contact Hours/week: 3

Credits : 3.00

CSE 3202

Sessional based on CSE 3201

Prerequisite: None

Sessional based on the theory of course CSE 3201.

Contact Hours/week: 3/2

Credits: 0.75

CSE 3203

Computer Architecture and Design

Prerequisite: CSE3109

Introduction to Computer Architecture: Internal Structure of Processor/CPU– Registers,

PC, ALU, CU, etc. Bus Architecture and Processor Interaction with Memory and Peripherals, Memory Hierarchy in Terms of Cache Memory, Main Memory, Secondary Storage, Memory Organization into Bytes and Words; Big-Endian and Little-Endian Organization, Computer Peripherals, Introduction to Von Neumann SISD Organization,

Contact Hours/week: 3

Credits: 3.00

RISC and CISC Machines.

Review: Representation of Strings, Binary and Hex Integer Representations and Conversions, Signed and Unsigned Formats; 2's Complement, Computer Integer Arithmetic, Fixed-Point Arithmetic, IEEE Floating Point Representation and Arithmetic.

Process and Control: Fetch-Execute Cycle, Encoding and Decoding of MIPS Machine Instructions, the MIPS CPU Instruction Set Syntax and Semantics, Addressing Modes, MIPS Assembly Language Programming, Register Usage Conventions, use of Stack and

Stack-Frame for Supporting Function Calling with Parameters, Operating System Calls and I/O Operations. CPU and its Instruction Sets Design.

Application HDL and FPGA for Microcomputer Design: Introduction to FPGA and HDL/VHDL for Digital Design Implementation.

CSE 3203

Computer Networks

Contact Hours/week: 3

Credits: 3.00

Prerequisite: None

Introduction: Definition, uses of Computer Networks, Network Topology, Network Media,

Network Devices, Different Types of Network: LAN, MAN, WAN etc.

IP Addressing: Classification of IP Addressing, Subnet Mask, CIDR, Private IP Address,

Public IP Address, Sub Netting, VLSM etc.

Network Model: OSI Reference Model, TCP/IT Reference Model, ATM Reference Model,

Functions of the Layers of Different Models, Network Protocols Working at Different Layers.

Data Link Layer Design Issues and Framing: Character Count, Byte Stuffing, Bit Stuffing, Error Detection: Cyclic Redundancy Check, Parity Bit Checking and Correction:

Hamming Code, Windowing Protocols: Go Back N ARQ, Selective Repeat ARQ, Elementary Data Link Protocols, High-Level Data Link Control, Point to Point Protocol, the

Medium Access Control Sub-Layer.

Multiple Access: Random Access; ALOHA, CSMA, CSMA/CD, CSMA/CA, Channelized

Access, CDMA, TDMA, FDMA, Controlled Access, Reservation, Poling, Token Passing, Ethernet, Wireless Lans and Bluetooth.

Switching: Circuit Switching, Packet Switching, Message Switching, Routing Algorithms, Virtual Circuit and Datagram, Congestion Control Algorithms, Quality of Service, Internetworking, Internetworking Devices etc.

Network Layer Protocols: Address Resolution Protocol, Internet Protocol, Internet Control, Message Protocol, IPV6, Routing Information Protocol, Open Shortest Path First, Border Gateway Protocol, User Datagram Protocol, Transmission Control Protocol.

Network Security: Cryptography, Substitution Cipher, Transposition Cipher, One Time

Pads, Public Key Cryptography, Encryption and Decryption, Authentication Protocol 1.0 to 5.0, Digital Signature, Key Distribution Center, Different Symmetric Key Algorithm, Certificate Authority, DNS, Electronic Mail, World Wide Web.

Others: HTTP and Recent Advances in Internet Protocols, Web Server Performance, Proxy Servers, Load Balancing in Web Servers, IP Security, Queuing Models for Networks

and Protocols, Real Time Protocols such as RTP, RTCP and RTSP, Voice over IP, Cloud Computing.

CSE 3206

Sessional based on CSE 3205

Prerequisite: None

Contact Hours/week: 3

Credits: 1.50

Sessional based on the theory of course CSE 3205.

CSE 3207

Peripherals and Interfacings

Prerequisite: CSE 3109

Contact Hours/week: 3

Credits: 3.00

Microprocessor Based System Design: Hardware and Software Interfacing in Microcomputer System Design, Hardware and I/O Design, Building, Debugging, Testing and Linking Program Modules, Programming EPROM.

Interfacing Components: 8284A Programmable Timer, Bus Architecture, Bus Timing, 8286 Transceiver Device, 8282 Latches, 8288 Bus Controller, Characteristics of Memory

and I/O Interface, Synchronous and Asynchronous Communication, Serial I/O Interface, 8251A Communication Interface, 8255A Programmable Peripheral Interface.

Interrupt System: Sources of Interrupt, Types of Interrupt, Handling Interrupt Request, Interrupt Vector and Table, 8259A Priority Interrupt Controller, Daisy Chain.

I/O Controller and Peripheral Components: Interfacing ICs of I/O Devices, I/O Ports, Programmable Peripheral Interface, DMA Controller I.E. 8237A DMA Controller, Interrupt

Controller, Communication Interface, Interval Timer, etc.

Memory Device: Memory Terminology, CPU-Memory Connections, ROM Architectures and Time Diagram, Different Type of ROM, Flash Memory, RAM Architectures and Time

Diagram, Different Type of RAM and Read/Write Cycle, Programmable Logic Device Architectures.

Multi-processor Configurations: Co-Processor Configurations, Numeric Data Processor, I/O Processors.

Analog and Digital Interface: Sensors, Transducers, D/A Interface, A/D Interface, AD and DA Converters Related Chips, High Power Devices.

CSE 3208**Sessional based on CSE 3207****Prerequisite: None**

Sessional based on the theory of course CSE 3207.

Contact Hours/week: 3/2**Credits: 0.75****CSE 3209****Artificial Intelligence****Prerequisite: None****Contact Hours/week: 3****Credits: 3.00****Fundamental:** Definition of AI, Historical Development of AI, Application of AI.**Production Systems:** Introduction of Product System, Production Rules, the Working Memory, the Control Unit Interpretation, Conflict Resolution Strategies, Alternative Approach for Conflict Resolution, Types of Production Systems, Forward Versus Backward Production Systems, Knowledge Base Optimization in a Production System.**General Problem Solving Approaches:** Breadth First Search, Depth First Search, Iterative Deepening Search, Hill Climbing, Simulated Annealing, Heuristic Search, A* Algorithm, Adversary Search, the Minimax Algorithm, Constraint Satisfaction Problems.**Logic and Structural Knowledge Representation:** Propositional Logic, First-Order Logic, Resolution Principle, Frames, Semantic-Nets, Petri Nets, Relational Data Model.**Reasoning under Uncertainty:** Bayesian Reasoning, Fuzzy Knowledge, Probability Theory, Dempster-Shafer Theory, Fuzzy Set Theory, Expert Systems.**Machine Learning and Natural Language Processing:** Naive Bayes Algorithm, Syntactic Semantics and Pragmatic, Top-Down Parsing, Bottom-Up Parsing, Lexicon.**Programming Languages for AI Research:** Historical Overview, Features of AI Programming Languages, Major AI Programming Languages LISP, PROLOG, Implementation of AI Algorithms Through PROLOG.**CSE 3210****Sessional based on CSE 3209****Prerequisite: None**

Sessional based on the theory of course CSE 3209.

Contact Hours/week: 3/2**Credits: 0.75**