CSE 3201: SOFTWARE ENGINEERING
100 Marks [50% Exam, 10% In-course/Quizzes/Class Tests, 5% Class Attendance, 10% Assignment and Presentation/Class Performance, 25% Mid-term]
3 Credits, *45* Contact hours, Exam. Time: 3 hours

Introduction: Overview of Software Industry, Introduction to Software Engineering. Software Development Process and Various Life Cycle Models. **Requirement Analysis:** Communication Techniques, Analysis Principles, Software Prototyping, Requirement Specification. **Group Dynamics:** Working in Teams, Characteristics of Successful Team, Understanding Group Dynamics. Team Roles and Temperament, Democratic Team and Chief Programmer Team Approach. **Introduction to Extreme Programming. Analysis Modeling:** Steps of system analysis. Feasibility study, Economic and technical analysis, System specification, the elements of analysis model. Data modeling, Functional modeling and information flow, Behavioral modeling. Mechanics of structured analysis. Data Dictionary. **Software Design:** Design principles, Design Concepts, effective modular design, design heuristics. Data Design, Architectural Design process. Transformation mapping, Transaction mapping, interface design, human-computer interface design, procedural design. **Software Testing:** Testing fundamentals, test case design, white-box testing, black-box testing, testing GUIs. Unit testing, Integration testing, validation testing, system testing, debugging. **Maintenance:** Major maintenance activities, estimating maintenance cost and productivity. **Technical Metrics for Software:** Software quality, Framework for technical metrics, metrics for analysis and design models, source code, testing and maintenance. **Software Architecture:** Pipe and Filter, Object Oriented, Event Based, Layered System, Data-centered repository, Process Control Architectures, **Objet Oriented Software Engineering:** O-O concepts, O-O analysis, Domain analysis, O-O analysis process, Object relational model. O-O design: system design process, object design process, O-O programming. **O-O Testing:** Testing strategies, test case design. **Service Oriented Software Engineering:** Introduction to SOA, SOAP, Analysis, design, validation, verification, implementation and maintenance of service oriented software; ESB, Messaging Architecture, Software Tools for SOA. **Software Project Management:** Cost estimation, risk analysis, project scheduling. **Introduction to CASE Tools:** What is CASE, taxonomy of CASE tools, iCASE environment, CASE repository, Example CASE tools. **Intellectual Properties:** Trade Marks, Copy Rights, Trade Secrets, Patents, **Introduction to UML.**

Books Recommended:

1.	Roger S. Pressman	:	Software Engineering, A practitioner's Approach,*McGraw-Hill*
2.	Ian Sommerville	:	Software Engineering, *Pearson Education.*
3.	Richard Fairley	:	Software Engineering Concepts, *McGraw-Hill.*
4.	Robert N. Charette	:	Software Engineering Environments,*McGraw-Hill.*
5.	S. L. Pfleeger and J.M. Atlee	:	Software Engineering Theory and Practice, *Pearson Education.*

CSE 3202: Software Engineering Lab
100 Marks [50% Practical, 45% Quizzes/Viva-voce/Lab Performance, 05% Attendance]
1.5 Credit, 45 Contact hours
Laboratory works based on CSE3201

CSE3203: Computer Graphics
100 Marks [50% Exam, 10% In-course/Quizzes/Class Tests, 5% Class Attendance, 10% Assignment and Presentation/Class Performance, 25% Mid-term]
3 Credits,*45*Contact hours, Exam. Time: 3 hours

Introduction to Computer Graphics and Graphics systems: Overview of computer graphics, representing pictures, preparing, presenting and interacting with pictures for presentations; Visualization and image processing: RGB color model, direct coding, lookup table; storage tube graphics display, Raster scan display, 3D viewing devices, Plotters, printers, digitizers, Light pens etc.; Active and Passive graphics devices; Computer graphics software.

Scan conversion: Points & lines, Line drawing algorithms; DDA algorithm, Bresenham's line algorithm, Circle generation algorithm; Ellipse generating algorithm; scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.

2D transformation and viewing: Basic transformations: translation, rotation, scaling; Matrix representations and homogeneous coordinates, transformations between coordinate systems; reflection shear; Transformation of points, lines, parallel lines, intersecting lines. Viewing pipeline, Window to view port co-ordinate transformation, clipping operations, point clipping, line clipping, clipping circles, polygons & ellipse.

3D transformation and viewing: 3D transformations: translation, rotation, scaling and other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane; general parallel projection transformation; clipping, view port clipping, 3D viewing.

Curves: Curve representation, surfaces, designs, Bezier curves, B-spline curves, end conditions for periodic Bspline curves, rational B-spline curves.

Hidden surfaces: Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Printer's algorithm, scan-line algorithm; Hidden line elimination, wire frame methods, fractal - geometry.

Color and shading models: Light & color model; interpolative shading model; Texture;

Books Recommended:

1.	Donald Hearn and M. Pauline Baker	:	**Computer Graphics**, *Prentice Hall*
2.	Steven Harrington	:	Computer Graphics: A Programming Approach, **McGraw-HillCollege**.
3.	F. S. Hill	:	**Fundamentals of Computer Graphics,** *Prentice Hall*
4.	Plastock and Kalley	:	**Computer Graphics,** *Mcgraw-hill.*
5.	Zhigang Xiang & Roy Plastock	:	**Computer Graphics,** *Mcgraw-hill.*

CSE3204: Computer Graphics Lab
100 Marks [50% Practical, 45% Quizzes/Viva-voce/Lab Performance, 05% Attendance]
1.5 Credit, 45 Contact hours
Laboratory works based on CSE3203

CSE3205: Microprocessor and Assembly Language
100 Marks [50% Exam, 10% In-course/Quizzes/Class Tests, 5% Class Attendance, 10% Assignment and Presentation/Class Performance, 25% Mid-term]
3 Credits, 45 Contact hours, Exam. Time: 3 hours

Microprocessors: Concept of microprocessor; Evolution of microprocessors; Internal architecture of Intel 8086/8088 microprocessors: Instruction set and Instruction format, System connections, timing, bus activities, address decoding, Interrupt structure, interrupt types, interrupt applications, DMA, minimum mode, maximum mode operations, I/O operation, Microprocessor interface ICs, Microprocessor based system design, cache memories, Coprocessor, Multiprocessor system; Intel 80286, 80386, 80486 processors: memory management scheme, Protection mechanism, modes; Advanced microprocessors.

Programming in assembly language: Assembly Language syntax, Program Data, Variables, Named constants, program structure, memory models, Input/Output instruction, Running program, Program Segment Prefix. The processor status and the Flag register, Overflow condition, Debugging a program. Flow control instructions, Conditional jumps, signed versus unsigned jumps, High-level language structures, branching and looping structures. Logic, Shift and Rotate Instruction, some common applications of Shift and Rotate operations. The Stack and Introduction to Procedures, Basic stack operations, Procedures Declaration, Communication between procedures, calling a procedures. Multiplication and Division Instructions, signed versus unsigned multiplications, Divide overflow, Signed Extension of Dividend. Arrays and related addressing modes, DUP operator, Register indirect modes, Based and Indexed Addressing modes, PTR operator, Based-indexed addressing modes, XLAt instruction. The string instructions, director flag, Moving a string, storing a string, Loading a string, scanning a string, comparing strings, substring operation. Text display and keyboard programming, the monitor, Video adapter and display modes, text mode programming, keyboard buffer and operation, scan codes.

Books Recommended:

1.	D. V. Hall	:	Microprocessors and Interfacing, McGraw-Hill, 1987.
2.	Rafiquzzaman	:	Microprocessor and Microcomputer based system design
3.	Ytha, Marut	:	Assembly language programming and organization of the IBM PC
4.	Y. Liu and G. A. Gibson	:	Microcomputer Systems: 8086/8088 Family, Prentice-Hall, 1991.
5.	Artwick	:	Microcomputer Interfacing
6.	Ramesh Goanker	:	Microcomputer Interfacing
7.	James E. Powell	:	Designing User Interfaces

CSE3206: Microprocessor and Assembly LanguageLab
100 Marks [50% Practical, 45% Quizzes/Viva-voce/Lab Performance, 05% Attendance]
1.5 Credit, 45 Contact hours

1. Registers, JMP, LOOP, CMP instruction, Conditional Jump instruction
2. Implementation of different types of instruction(rotating, shifting)
3. Instructions (MUL, IMUL, DIV, IDIV, CBW, CWD, Arrays, XLAT)
4. String instructions, macro handling
5. Bios Interrupt, Dos Interrupt
6. The IN, OUT, INS, and OUTS instruction
7. Processor signal from photodiode

8. Control of stepper motor using parallel port
9. Location detection using GPS through USB port

CSE3207: Computer Networks
100 Marks [50% Exam, 10% In-course/Quizzes/Class Tests, 5% Class Attendance, 10% Assignment and Presentation/Class Performance, 25% Mid-term]
3 Credits, 45 Contact hours, Exam. Time: 3 hours

Introduction: Introduction to Computer Networks. Network Goals. Applications of Networks. Network Structure. Network Architectures. The OSI Reference Model, Data Transmission in the OSI Model. OSI Terminology. The ARPANET.
Local Area Network: LAN Technology - Architecture, Topology.
Wired LANs: Ethernet and Fast-Ethernet, Token Ring, FDDI.
Wireless LANs: IEEE 802.11. Bluetooth. Backbone Networks. Virtual LANs.
Wide Area Network: SONET. Virtual Circuit Networks - Frame Relay. ATM and ATM LANs.
Network Layer: Logical Addressing.
Internet Protocol: Internetworking, Routing Protocol, IPv4 and IPv6.
Address Mapping, Error Reporting and Multicasting: ICMP, IGMP, ICMv6. Delivery. Forwarding and Routing.
Transport Layer: Process-to-Process delivery, Transport Services. Protocol mechanisms. TCP. UDP. SCTP, Congestion and QoS.
Application Layer: Domain Name System, Abstract Syntax Notation One (ASN.1). Network Management - SNMPv2. Electronic mail - SMTP and MIME. Uniform Resource Locator (URL) and Universal Resource Identifier (URI). Hypertext Transfer Protocol (HTTP).
Wireless and Mobile Networking: Wireless Networking: Issues and Trends. Wireless Physical Layer Concepts , Wireless Cellular Networks, Mobile IP - IPv4, IPv6, TCP over Wireless, Ad Hoc Networks: Issues and Routing. Wireless Sensor Networks, Wireless Mesh and Multi-Hop Relay Networks, Wireless Network Security. Energy Management in Ad Hoc Wireless Networks.
Network Security: Security requirements and attacks. Privacy with conventional encryption. Message Authentication and Hash functions, Public-key encryption and digital signatures. Ipv4 and Ipv6 security.

Books Recommended:

1.	Behrouz A. Forouzan	:	**TCP/IP Protocol Suite.** *McGraw-Hill*
2.	Andrew S. Tanenbaum	:	**Computer Networks.** *Prentice Hall*
3.	William Stallings	:	**Data and Computer Communications.** *Prentice Hall*
4.	Behrouz A. Forouzan	:	**Data Communications and Networking.** *McGraw-Hill*

CSE3208: Computer Networks Lab
100 Marks [50% Practical, 45% Quizzes/Viva-voce/Lab Performance. 05% Attendance]
1.5 Credit, 45 Contact hours
Laboratory works based on **CSE3207**

Subnetting and designing a network using Packet Tracer.
Analysis of the TCP/IP behavior.
Packet analysis.
Server configuration: DHCP, SMTP, FTP, Web
Switch and Router Configuration.
Socket Programming

CSE 3209: Software Development - II

100 Marks [35% Internal Examiner, 35% External Examiner, 30% Presentation and Oral Examination]
1.5 Credit, 45 Contact hours

Projects must possess innovative ideas which reflect contemporary IT trends. Supervisor have to ensure that every accepted project contain basic level of research work. Projects that meet the software/hardware requirements of BRUR or any other IT organization are highly preferable. Students have to give a presentation on their project works. Departments should take appropriate steps to archive all the projects and keep tracks to maintain the genuineness of the projects.

CSE 3210: Viva-Voce

Viva based on studied Third Year courses.