Subject

1	**Object-Oriented Programming C++** **Reference:** • "Object Oriented Programming using C++", Joyce Farrell • "Object Oriented Programming in C++", Robert Lafore, 4th edition **Topics:** Pointer, class features and design issues, objects and classes, friends and operator overloading, using a template, inheritance, virtual functions, and handling exceptions.
2	**Digital Electronics and Electronic Circuits Design** **Reference:** • "Electronics Devices and Circuit Theory", Robert Boylestad and Louis Nashelsky, 7th edition • "Electronics Devices: electron flow version", Thomas L. Floyd, 9th edition, 2012. **Topics:** Semiconductor diode and application, transistor construction (biasing and applications), FET and MOSFET transistor (construction and biasing), Logic Families (TTL, ECL, MOSFET, IIL), Timer circuits NE555 (A stable and Monostable circuits), Oscillator circuits, A/D and D/A converters, Operation Amplifies and Applications.
3	**Computer Architecture** **Reference:** • "Computer system architecture", 4th edition, M Morris Mano, 2007 • "Computer Organization and Design: the Hardware/Software Interface", 5th edition, David A. Patterson and John L. Hennessy, 2014. **Topics:** ALU and Control Unit Design, Organization of CPU, Memory Organization, I/O Organization, Pipelining Design

4	## Microprocessors **References:** - THE INTEL MICROPROCESSORS 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-Bit Extensions, 8th edition, by: Barry B. Brey - The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications, 4th edition, by: Walter A. Triebel & Avtar Singh. **Topics**: The internal architecture of 8086 microprocessors, Programming of 8086 microprocessors, Memory interfacing with 8086 microprocessors, I/O interfacing with 8086 microprocessors, and Interrupts organization within 8086 Microprocessors.
5	## Computer Networks **References:** - Data communication and networking by behrouz a. forouzan 4th edition. 2007 - Larry L. Peterson, Bruce S. Davie, Computer Networks: A Systems Approach, Fifth Edition, 2011 **Topics:** Network Models, Transmission Media, Error Detection and Correction, Data Link Control, Multiple Access, Wired LANs: Ethernet, Wireless LANs, Network Layer Protocol (Network layer services, Unicast Routing Protocols, Multicast Protocols, IPv4 and IPv6 Addresses and Interface Identifiers)
6	## Digital Signal Processing **References**: - Digital Signal Processing Fundamentals and Applications Li Tan DeVry University Decatur, Georgia AMSTERDAM **Topics**: Signal Sampling and Quantization, Analog-to-digital conversion, Digital-to-Analog, Conversion, and Quantization, System Representation Using Its Impulse Response, Bounded-in-and-Bounded-out, Digital Convolution, Discrete Fourier Transform and Signal Spectrum DFT, FFT, Discrete Fourier Transform Formulas, The z-transform, Properties of the z-Transform, Inverse z-Transform, Basic Filtering Types.

7	## Parallel Processing **References:** • Peter Pacheco, An introduction to parallel Programming, Morgan Kaufmann, 2011 • Michael Quinn, Parallel Programming in C with MPI and OpenMP, McGraw-Hill **Topics:** Parallel computing and distributed programming, parallel architecture, parallel programming models, parallel programming methodology, parallel programming model and algorithm design, shared memory programming, performance analysis of parallel programs, MPI parallel programming model GPGPUs, CUDA, and OpenCL.
8	## Soft Computing **References:** • Soft Computing and Intelligent Systems Design: Theory Tools and Applications, Fakhreddine O. Karray and Clarence de Silva, Pearson Education Limited (**Ch2, Ch4, Ch7, Ch8**) • Fundamentals of the New Artificial Intelligence Neural, Evolutionary, Fuzzy and More, Toshinori Munakata, Springer-Verlag London Limited (**Ch2, Ch3, Ch4, Ch5**) **Topics:** Artificial Neural Networks, Self-Organizing Maps, Recurrent Neural Networks, Associative Memory. Fuzzy Sets, Fuzzy Theory, Fuzzy Systems. Evolutionary Computing, Genetic Algorithms, Genetic Programming, Swarm Intelligent. Hybrid Systems, Adaptive Neuro-Fuzzy Inference Systems, Evolutionary Neural Networks.
9	## Internet Programming **References**: • "PHP and MySQL for Dynamic Web Sites: Visual QuickPro Guide" by Larry • "HTML and CSS: Design and Build Websites" by Jon Duckett • "HTML, CSS & JavaScript in easy steps" Mike McGrath **Topics**: **Client-Side Web Development:** HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), JavaScript **Server-Side Web Development with PHP:** Introduction to PHP, PHP Syntax and Basics, Database Management with MySQL (or MariaDB), Object-Oriented PHP