CS-601 – Micro Processor and Interfacing

RATIONALE:
The purpose of this subject is to cover the underlying concepts and techniques used in Micro Processor and Interfacing. In this subject we cover the unique issues associated with designing, testing, integrating, and implementing microcontroller/microprocessor-based embedded systems.

PREREQUISITE
The students should have acquired fundamental microcontroller-associated programming skills using both the C programming language and assembly language

Unit-I

Microprocessor and Microprocessor Development Systems: Evolution of Microprocessor,

Microprocessor architecture and its operations, memory, inputs-outputs (I/Os), data transfer schemes interfacing devices, architecture advancements of microprocessors, Typical microprocessor development system.

Unit-II

8085 Microprocessor: Architecture of 8085 microprocessor, Instruction set and Addressing modes of 8085 microprocessor, Assembly language programs of 8085 microprocessor, Stack, Subroutines, Time-Delay loops, Modular programming, Macro.

Unit-III

8086 Microprocessor: Architecture, Registers, Memory Segmentation, 8086 Memory Addressing, Memory Read and Write Bus Cycle of 8086, Demultiplexing of the system Bus in 8086 and 8088 microprocessors, Instruction set and Addressing modes of 8086 microprocessor, Assembly language programs of 8086 microprocessor.

Unit-IV

I/O and Memory Interfacing Using 8085/8086: memory interfacing, Interrupts of 8085/8086 Microprocessors, 8259A Programmable Interrupt Controller, Programmable peripheral Interface, 8253 Programmable Counter/Interval Timer.

Communication and Bus Interfacing with 8085/8086 Microprocessor: Serial Communication Interface, DMA Controller 8257, 8279-Programmable Keyboard and Display I/O Interface, Bus Interface, 8089 I/O processor

Unit-V

8051 Microcontroller: Architecture of 8051 microcontroller, Memory organization, Timers/Counters, Interrupts, Addressing modes, 8051 Instruction set, Assembly language Programs, Applications of microcontrollers.

Suggested Reading:
1. Douglas V Hall, “Microprocessors and interfacing – Programming & Hardware” TMH
2. Gaonkar, “Microprocessor Architecture, Programming & Applications with 8085”, TMH

http://www.rgpvonline.com
3. Rafiquzzaman, “Microprocessors-Theory & Applications”, PHI
4. Savaliya, “8086 Programming & Advance Processor Architecture”, Wiley India
5. Ray, Bhurchandi, “Advanced Microprocessor and peripherals” TMH Pub
6. Soumitra Kumar Mandal, “Microprocessors and Microcontroller” TMH Pub

**List of Experiments**

1. To study 8085 based microprocessor system
2. To study 8086 based microprocessor system
3. To develop and run a program for finding out the largest/smallest number from a given set of numbers.
4. To develop and run a program for arranging in ascending/descending order of a set of numbers.
5. To perform multiplication/division of given numbers
6. To perform conversion of temperature from 0F to 0C and vice-versa
7. To perform computation of square root of a given number
8. To perform floating point mathematical operations (Addition, Subtraction, Multiplication and Division)
9. To obtain interfacing of RAM chip to 8085/8086 based system
10. To obtain interfacing of keyboard controller
11. To obtain interfacing of DMA controller
12. To obtain interfacing of PPI
13. To perform microprocessor based temperature control of hot water
CS-602 – Principles Of Programming Languages

RATIONALE:-
The purpose of this subject is to cover the underlying concepts and techniques used in Programming Languages. It provides general idea related to operating & Programming environment.

PREREQUISITE:-
The students should have general idea about programming language. In addition, a familiarity with Elementary and Structured Data Types is needed for better understanding.

UNIT-I

UNIT-II
Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Sequence control with Expressions, Conditional Statements, Loops, Exception handling.

UNIT-III
Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, design issues for functions overloaded operators, co routines.

UNIT-IV
Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, Static and Stack-Based Storage management. heap based storage management. Garbage Collection. object oriented programming in small talk, C++, Java, C#, PHP, Perl. Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

UNIT – V
Exception handling, Exceptions, exception Propagation, Exception handler in C++ and Java. Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming. Functional Programming Languages: Introduction, fundamentals. Introduction to 4GL.

Suggested Reading:
5 Cavlo Ghezzi & Mehdi Jazayeri " Programming Languages Concepts", Willey India

http://www.rgpvonline.com
CS-603 – Software Engineering & Project Management

RATIONALE:
The purpose of this subject is to cover the underlying concepts and techniques used in Software Engineering & Project Management. Some of these techniques can be used in software design & its implementation.

PREREQUISITE:-
The students should have at least one year of experience in programming a high-level language and databases. In addition, a familiarity with software development life cycle will be useful in studying this subject.

Unit I: The Software Product and Software Process:

Unit II: Requirement Elicitation, Analysis, and Specification
Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented software development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability

Unit III: Software Design

Unit IV: Software Analysis and Testing

Unit V: Software Maintenance & Software Project Measurement
Need and Types of Maintenance, Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support.


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Practical and Lab work

Lab work should include a running case study problem for which different deliverables at the end of each phase of a software development life cycle are to be developed. This will include modeling the requirements, architecture and detailed design. Subsequently the design models will be coded and tested. For modeling, tools like Rational Rose products. For coding and testing, IDE like Eclipse, NetBeans, and Visual Studio can be used.

Suggested Reading:

5. Richard H. Thayer,”Software Engineering & Project Managements”,Wiley India
6. Waman S. Jawadekar, ”Software Engineering”, TMH
CS-604 – Computer Networking

RATIONALE:-
The purpose of this subject is to cover the underlying concepts and techniques used in Computer Networking. This syllabus provides a comprehensive introduction to computer network, network architecture and protocols.

PREREQUISITE:-
The students should have thorough exposure in Analog and Digital Communication and Data Communications. Knowledge of Topology and protocol will help in better understanding

Unit –I
Computer Network: Definitions, goals, components, Architecture, Classifications & Types.
Queueing Models: Little’s Theorem, Queueing System: M/M/1, M/M/m, M/M/∞, M/M/m/m, M/G/1

Unit-II

Unit-III

Unit-IV

Unit-V
References:


List of Experiments:

1. Study of Different Type of LAN & Network Equipments.
2. Study and Verification of standard Network topologies i.e. Star, Bus, Ring etc.
3. LAN installations and Configurations.
4. Write a program to implement various types of error correcting techniques.
5. Write a program to Implement various types of framing methods.
8. Study & Installation of ONE (Opportunistic Network Environment) Simulator for High Mobility Networks.
9. Configure 802.11 WLAN.
10. Implement & Simulate various types of routing algorithm.
12. Study of Application layer protocols- DNS, HTTP, HTTPS, FTP and TelNet.
CS-605 – Advance Computer Architecture (ACA)

RATIONALE:
The purpose of this subject is to cover the underlying concepts and techniques used in Advance Computer Architecture. The Syllabus discusses principles of parallel algorithms design and different parallel programming models.

PREREQUISITE
The students should have general Idea of Computer Organization. In addition, a familiarity with Memory organization, Computational models is required.

Unit-I
Flynn’s Classification, System Attributes to Performance, Parallel computer models - Multiprocessors and multicomputers, Multivector and SIMD Computers. Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms. Static interconnection networks, Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multiport Memory, Multistage and Combining Networks.

Unit-II

Unit-III
Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling - score boarding and Tomosulo’s algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines. Superscaler pipeline design, Super pipeline processor design.

Unit-IV

Unit-V
Parallel Programming Models, Shared-Variable Model, Message-Passing Model, Data-Parallel Model, Object-Oriented Model, Functional and Logic Models, Parallel Languages and Compilers, Language Features for Parallelism, Parallel Programming Environment, Software Tools and Environments.

Suggested Reading:
1. Kai Hwang, “Advanced computer architecture”, TMH.
2. J.P.Hayes, “computer Architecture and organization”; MGH.
6. Hwang and Briggs, “Computer Architecture and Parallel Processing”; MGH.