MICROPROCESSOR & INTERFACING

L	T	P		
3	0	2		**Curri. Ref. No.: CSE407**

Total Contact Hrs.:75   **Total Marks: 100**   **Theory:**
Theory: 45   End Exam : 70
Tutorial:30   P.A.: 30
Practical:30   **Practical:50**
Prerequisite: CSE403, CSE404   End Exam.:25
Credit: 3   P.A. :25

DETAIL COURSE CONTENTS:
THEORY:
Periods: 3 P/W

UNIT	TOPIC/SUB-TOPIC	Total hrs.
1	**Introduction to Microprocessor:** Evolution of Microprocessors,Specific features of Microprocessors, Application in our daily life (a few examples)	2
2	**Internal architecture of a microprocessor (using block diagram):** Evolution of Microprocessors,Specific features of Microprocessors, Application in our daily life (a few examples) Consumer Behaviour: Basic Law of Demands and Supply Concepts and measurement of elasticity of demand	6
3	**Addressing Modes:** Addressing modes in general (may be limited to 8085 and 8086/8088 CPU), Instruction cycles, Instruction set, timing diagram (may be limited to 8085 and 8086/8088 CPU). Concept of assemblers and compilers.	3
4	**Interfacing of Memory and I/O devices :** Concept of address space, address/data bus demultiplexing, address and data bus buffering, address decoding, I/O concepts, memory interfacing concept of I/O mapped I/O and memory mapped I/O. Interrupts - Types of interrupts, Hardware and software data transfer schemes - Synchronous, asynchronous and interrupt driven.	5

5	**Assembly Language Programming :** (This part may be limited to the use assembly language of 8085 or 8086/8088 CPU) i) Example for register to register, register to memory, memory to register, block of data movement from one area of memory to another, merging of two blocks of data, data block exchange. ii) Examples of arithmetic addition, subtraction, multiplication and division. iii) Examples of searching and sorting (simple) iv) Examples using of look up tables v) Use subroutines and delay program.	10
6	**Peripheral chips and their Interfacing :** Functional description of 8255, 8253, 8251, 8257, 8237 and 8259. Interfacing of these chips with some standard CPU. Simple assembly language programs to explain the function of these chips.	6
7	**Special Purpose Interfacing Devices and their Interfacing :** Meaning and Function of Money Introduction to the concepts of the value of Money	4
8	**Recent standard μp :** Intel family, HP family and Motorola family. Concepts of embedded μp.	4
9	**PC Interfacing :** Simple interfacing of Input/Output peripherals like LED, 7 segment LED display modules, steppes motor, relays through digital I/O card or through the parallel port. Serial link between microprocessor trainer kit and PC serial port, EPROM programming using PC port.	5
	Total Hrs:	**45**

PRACTICAL:
Classes: 2 P/W
List of Experiments: -
1. Acquaintance with the microprocessor trainer kit hardware and the user's commands (Dynalog/Vinyties/ALS)
2. Assembly language programdevelopment : Data transfer program - Register to Register, Register to Memory and Vice-Versa.
3. Array processing - Adding one entry to an array, checking of an ordered list, replacing of one or more entries in a list, sorting and searching, block movement, block exchange and data insertion.
4. Look-up table - finding squares, cubes etc., of a number using look-up table, code conversion using look-up table

5. Delay program, use of subroutine (use the above program as a subroutine in a main program.
6. Data Input/output - Programming 8255 with the basic I/O modes, programming 8253, interfacing 7-segment display, bar graph display, multiplexed display, programming 8253, in different modes, waveshape generation using 8253, Interfacing of ADC and DAC with microprocessors/microcontroller, keyboard interfacing (using interrupts or polling) to microprocessor/microcontroller, relay interfacing, stepper motor interfacing.
7. PC Interfacing: Experiments on ADC/DAC interfacing, to stepper motor interfacing and display interfacing, Other interfacing problems may be repeated using PC interfacing and run by using any High level language.

TEXT / REFERENCE BOOKS:

1. Introduction to Microprocessor - by A.P. Mathur, TMH
2. Microprocessor - by Ramesh S. Gaonkar, PHI
3. Microprocessor - by D.Hall, MGH
4. IBM PC & Clones - by Govindarajalu, TMH
5. Computer Organization & Architecture - by William Stalings, PHI

LIST OF EQUIPMENT:

1.	PC (for detail, please refer Annex – I)	2.	UPS
3.	Printer	4.	Digital real-time oscilloscope
5.	Function Generator	6.	Digital Multimeter
7.	CBT/CAI Interface Base Unit	8.	Light Sensor Module
9.	Temperature Sensor Module	10	Pressure Transducer Module
11	Sensor Module – Semiconductor Temperature, Light Sensor, Pressure Sensor & Magnetic Sensor	12	• Stepper Motor Control Module • Intel MCS-51 Microcontroller System. • EPROM Programmer
13	32-Bit Microprocessor, 8085 Microprocessor kit (trainer).	14	LED Display
15	Peripheral chips, 8255, 8253, 8251, 8237, 8259	16	Microassembler

COMPUTER COMMUNICATION & NETWORKING

L	T	P		Curri. Ref. No.: CSE412
1	0	3		

Total Contact Hrs.:75   **Total Marks: 150**   **Theory:100**

Theory: 45

Tutorial: 0

Practical: 30

Pre-requisite: CSE405

Credit :4

End Term Exam: 70

P.A.: 30

Practical: 50

End Term Exam:25

P.A.: 25

UNIT	TOPIC/SUB-TOPIC	Total hrs.
1	**Introduction:**	**6**

1.1 The uses of Computer Network

    1.1.1 Network Goals

    1.1.2 Application of Network

1.2 Network Structures

1.3 Network Architecture

    1.3.1 Protocol Hierarchies

    1.3.2 Design Issues for the Layers

1.4 The O.S.I Reference Model

1.5 Services

    1.5.1 OSI Terminology

    1.5.2 Connection-oriented and Connectionless services

    1.5.3 Service primitives

    1.5.4 The Relationship of services to protocols

1.6 Example Network

    1.6.1 Public Networks

    1.6.2 ARPANET

    1.6.3 Novell Netware

2 The Physical Layer   **6**

  2.1 Transmission Media

  2.2 Wireless Transmission

  2.3 Telephone System

  2.4 ISDN

  2.5 Transmission and Switching

  2.6 LAN Topology & LAN Media

3 The Medium Access Sub layer   **5**

  3.1 ALOHA

  3.2 CSMA

  3.3 Collision Free Protocols

  3.4 IEEE Standard 802 for LAN – Ethernet, Token Bus, Token Ring.

  3.5 Network Devices: Repeaters, Hubs, Switches, Routers, Gateways

4 The Data Link Layer   **4**

  4.1 Data Link Layer Design Issue

  4.2 Error Detection and Correction

  4.3 Elementary Data Link Protocols

  4.4 Sliding windows protocols

5 The Network Layer   **4**

  5.1 Network Layer Design Issues

  5.2 Routing Algorithms

  5.3 Congestion Control Algorithms

6 The Transport Layer   **4**

  6.1 The Transport Services

  6.2 Elements of Transport Protocols

  6.3 A simple Transport Protocols

7 The session Layer   **4**

  7.1 Design Issues

    7.1.1 Concept of Data exchange, dialog management, activity management

  7.2 Remote Procedure Call

    7.2.1 Client-server model

    7.2.2 Semantics of R.P.C

8 The Presentation Layer   **4**

  8.1 Design Issue

  8.2 Data Compression Techniques

  8.3 Elementary idea of cryptography

9 The Application Layer   **3**

  9.1 Design Issue

  9.2 File Services

  9.3 E Mail

10 Concepts of Internet and www , Html, TCP/IP   **5**

      Total Hrs: 45

PRACTICAL

Total Periods: 30

    Periods: 2P/W

1.   Study and describe the differences between centralised distributed and collaborative computing. (Students may be told to identify from given specification of system).

2.   Case studies of LAN, MAN, WAN

3.   Study and describe client, server, peers (identify from given specification)

4   Study network services - remote login, telnet, ftp (Either from internet or a network being made available)

5. Determine how a specific network service is affected given a network architecture (centralised and distributed).

6. Demonstrate different transmission media -
   Twisted pair cables, Co-axial cables, Wireless, Identify advantages and disadvantages

7. Identify, describe - Network connectivity devices like Media connector, Interface boards, Modems, Repeaters, Hubs, Switch, Bridges, Multiplexer, Routers.

8. Study main protocols through Windows 8 / 10 / Linux (any two in details)(TCP/IP, SLIP, PPP, FDDI, X.25, ISDN, ATM).

9. Laboratory setting-up of ethernet, installation of ethernet card and testing.

10. Design a LAN.

11. Configure Network Server
    Windows NT, Server installation, network printing, network application, client server

12. Configure Network Clients

13. Preventing Problems in a Network .Physical, electrical, virus, worm security

14. Troubleshooting - Isolating a problem, recovery from disaster, study of Tools, terminators, cableprotocol analysers

15. Network Administration

REFERENCE BOOKS:
1. Computer Network – by A. S. Tanenbaum, PHI
2. Data Communication & Computer Networks – by W. Stallings, PHI
3. Data Communication and Networking – by B.A. Forouzan TMH

LIST OF EQUPMENT

Hardware :
   i) Stand alone PC (for detail, please refer Annex – I)
   ii) Unix-based Server (for detail, please refer Annex – I)
   iii) NT-based Server (for detail, please refer Annex – I)
   iv) Hub (8 port/16 port)
   v) Switch
   vi) Bridge
   vii) Multiplexer
   viii) Modems
   ix) Router
   x) Network Interfacing Cards
   xi) Wire Cutter and Stripper
   xii) UTP Cables fitted with RJ-45 connectors
   xiii) STP Cables
   xiv) Coaxial Cables
   xv) Terminators
   xvi) Interface Boards
   xvii) Printers (Dot Matrix/Laser/Deskjet)

Software :
   i) Unix Operating System
   ii) NT Operating System
   iii) Windows 10/8/2012
   iv) Network Interfacing Card Drivers
   v) Anti-virus Software
   vi) Firewall Software

DATA STRUCTURE & ALGORITHM

L	T	P	Curri. Ref. No.: CSE406
3	0	4	

Total Contact Hrs.:105   Total Marks: 150

Theory: 45

Practical: 60

Tutorial: 0

Pre-requisite: G206B, CSE402

Credit :5

Theory:

End Exam : 70

P.A.: 30

Practical: 50

End Exam.: 25

P.A. : 25

THEORY:

UNIT	TOPIC/SUB-TOPIC	Total hrs.
1	**Introduction and overview:**	**2**
	1.1 Introduction	
	1.2 Basic Terminology	
	1.3 Elementary Data Organization	
	1.4 Data Structures	
	1.5 Data Structure Operations	
	1.6 Algorithms; Complexity; Time- space Tradeoff	
2	**Preliminaries**	**3**
	2.1 Introduction	
	2.2 Mathematical notation and Functions	
	2.3 Algorithmic Notation	
	2.4 Control Structures	
	2.5 Complexity of Algorithms	
	2.6 Sub algorithms	
	2.7 Variables	
	2.8 Data Types	
3	**String Processing**	**5**
	3.1 Introduction	
	3.2 Basic Terminology	
	3.3 Storing Strings	
	3.4 Character Data Type	
	3.5 String Operation	
	3.6 Work Processing	
	3.7 Pattern matching Algorithms	
4	**Arrays, Records and Pointers**	**8**
	4.1 Introduction	
	4.2 Linear Arrays	
	4.3 Representation of Linear Arrays in Memory	
	4.4 Traversing Linear Arrays	
	4.5 Inserting and Deleting	
	4.6 Sorting; Bubble Sort	
	4.7 Search; Linear Search	
	4.8 Binary Search	
	4.9 Multidimensional Arrays	
	4.10 Pointers; Pointer Arrays	
	4.11 Records; Record Structures	
	4.12 Representation of Records in Memory; parallel Arrays	
	4.13 Matrices	
	4.14 Spares Matrices	
5	**Linked Lists**	**5**
	5.1 Introduction	
	5.2 Linked Lists	
	5.3 Representation of Linked Lists in Memory	

OBJECT ORIENTED METHODOLOGY

L	T	P		Curri. Ref. No.: CSE502
3	0	2		

Total Contact Hrs.:105   **Total Marks: 100**   **Theory: 100**

Theory: 45   End Exam : 70
Tutorial:0   P.A.: 30
Practical: 30   **Practial: 50**
Pre-requisite: CSE402   End Term Exam: 25
Credit : 5   P.A.: 25

THEORY: 45 Hrs.

UNIT	TOPIC/SUB-TOPIC	Total hrs.
1	**Object oriented programming concepts**	7
	1.1 Objects	
	1.2 Classes	
	1.3 Methods and messages	
	1.4 Abstraction and inheritance	
	1.5 Abstract classes	
	1.6 Polymorphism	
	1.7 Introduction to C++- objects-classes-constructors and destructors	
2	**Operator overloading**	12
	2.1 Friend functions	
	2.2 Type conversions	
	2.3 Templates	
	2.4 Inheritance	
	2.5 Virtual functions	
	2.6 Runtime polymorphism	

PRACTICAL

Total Periods : 60
Classes : 4 P/W

Programs Related to :-

1. Creation of singly & doubly linked list

2. Insertion, deletion and updation of (1) above

3. Creation of stack, queue and insertion/deletion operation on Stack/Queue

4. Conversion amongst infix, prefix & postfix expressions

5. Creation of tree and insertion/deletion of a node

6. Tree traversal problem

7. Graph search algorithms

8. Searching & Sorting Algorithm

REFERENCE BOOKS :

1. Data Structures - by SeymolurLipschutz (Schaum Series)
2. Fundamentals of Computer Algorithms - by Horowitz,E&Sahani, S - Galgotia
3. Data Structures Theory Applications - by Trembly& Sorenson, TMH
4. Data Structure through C – by Mc Grew Hill

LIST OF EQUIPMENT

Hardware :   Stand alone PC
              (for detail, please refer Annex – I)

Software :   C Compiler

3	**Exception handling**	8
	3.1 Streams and formatted I/O	
	3.2 file handling	
	4.3 namespaces	
	3.4 String Objects	
	3.5 standard template library	
4	**Introduction to JAVA**	8
	4.1 Bytecode	
	4.2 Virtual machines	
	4.3 Objects	
	4.4 Classes	
	4.5 Javadoc	
	4.6 Packages	
	4.7 Arrays	
	4.8 Strings	
5	**Inheritance**	10
	5.1 Interfaces and inner classes	
	5.2 Exception handling	
	5.3 Threads	
	5.4 Streams, and	
	5.5 I/O	

Total Hours: 45

PRACTICAL:
Total Periods: 60
Classes: 4 P/W

Problems on C++ and Java:

1. Objects and classes
2. Declaring and creating objects
3. Constructors and Modifiers
4. Passing objects to methods
5. Instance variables and class variables
6. Instance method & class method
7. Scope of variables interface and packages
8. Introductory Problems on Class Inheritance Super classes and sub class
9. Calling super class constructors
10. Calling super class methods
11. Object class , Number class
12. Processing date and time
13. Class Templates and Exceptional handling

REFERENCE BOOKS:
1. B. Trivedi, "Programming with ANSI C++", Oxford University Press, 2007.
2. Cay S. Horstmann, Gary Cornell, "Core JAVA volume 1", Eighth Edition, Pearson
3. K. Arnold and J. Gosling, "The JAVA programming language", Pearson Education,
4. D. S. Malik, "C++ Programming: From Problem Analysis to Program Design", Thomson Course Technology.

LIST OF EQUIPMENTS:
Hardware: Standalone PC (for detail, please refer Annex – I)

Software : Java Compiler, Visual studio, JDK

UNIX OPERATING SYSTEM

L	T	P		Curri. Ref. No.: CSE409
3	0	2		

Total Contact Hrs.:   **Total Marks: 100**   **Theory: 100**
Theory: 45   End Exam :70
Tutorial: 0   P.A.: 30
Practical: 30   **Practical: 50**
Prerequisite: CSE404   End Exam.:25
Credit: 4   P.A. :25

THEORY:
Total Periods : 45
Periods: 3P/W

UNIT	TOPIC/SUB-TOPIC	Total hrs.
1	**Introduction:**	**2**
	1.1 Definition of O.S	
	1.2 History of O.S	
	1.3 Concepts	
	1.4 Structure	
2	**Processes**	**4**
	2.1 Definition of process & thread	
	2.2 Interprocess communication	
	2.3 Classical I.P.C. problems	
	2.4 Process Scheduling	
3	**Process Scheduling Algorithms**	**5**
	3.1 Resident Monitor(Single user)	
	3.2 Multi user system	
	3.3 Time sharing system	
	3.4 FIFS	
	3.5 Round Robin Fashion/Time quantum. Concept.	
	3.6 Multiple queues	
	3.7 Priority queues	
	3.8 Shortest job first	
4	**Memory Management**	7
	4.1 Resident Monitor	
	4.2 Multiple Partition	
	4.3 Garbage collection and compaction	
	4.4 Paged memory management	
	4.5 Page Replacement Algorithms	
	4.6 Swapping	
	4.7 Segmentation	
	4.8 Segmented paged memory management	
	4.9 Demand paged memory management	
	4.10 Virtual Memory	
5	**File Systems**	**5**
	5.1 Concept of Files & Directories	
	5.2 File System Implementation	
	5.3 Security Issues in Files	
	5.4 Protection Mechanisms	
	5.5 Case studies of Unix file system	
6	**Input / Output**	**4**
	6.1 Principles of I/O Hardware	
	6.2 Principles of I/O Software	
	6.3 Disks	
	6.4 Clocks	

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6.5   Serial and Parallel port access

6.6   Terminal Access

7   Device Management   **3**

7.1   Techniques for Device Management – Dedicated, shared, virtual

7.2   Device allocation considerations I/O traffic control & I/O Schedule, I/O Device handlers

7.3   SPOOLing

8   Deadlocks   **5**

8.1   Concept of deadlock

8.2   Resources

8.3   Dead lock Prevention: Banker's Algorithm & Safety Algorithm

8.4   The Ostrich Algorithm

8.5   Deadlock Detection and Recovery

8.6   Deadlock Prevention

9   Distributed O.S.   **5**

9.1   Introductory concepts

9.2   Types of Distributed O.S

9.3   Workstation server model

9.4   The processor pool model

9.5   The hybrid model

9.6   Case study SUN NFS File Server

10   Case Studies   **5**

10.1   UNIX & LINUX O.S

10.2   MS-DOS & WINDOWS XP / Vista / 7

10.3   WINDOWS – 2003, 2008

Total Hours: 45

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PRACTICAL:
Total Periods: 30
Classes: 2 P/W

UNIX (Linux):

Overview of UNIX

1.   UNIX as an Operating system, Kernel, Shell and User, UNIX File System,Files and Directories, Access permission, File system hierarchy

Basic UNIX Commands

Listing of files and directories, Copying, Deletion, Renaming and Comparing files, Creation, Navigation and Removing directories, Access

2.   permission of files and directories, Editors in UNIX, Status of users, terminals, date and time, Displaying blown-up message, Paging and printing of files, Background jobs

Advance Features of UNIX

3.   I-nodes, Trees, Pipes and Filters, Cutting, Pasting and Sorting of files, Searching for a pattern in a string

Programming with the Shell

4.   System variables and shell variables, Interactive shell scripts, shell termination, Conditional statements, Looping statements, Special parameters in shell Computation and string handling

REFERENCE BOOKS :
1.   Operating System – Madnick and Donovan - MGH
2.   Operating System Concepts – A. Silberschatz and P. Galvin - ADP
3.   The UNIX Programming Environment – by Kernighan & Pike - PHI
4.   UNIX – Concepts & Application – by Sumitabha Das - TMH

LIST OF EQUIPMENT

Hardware :   Unix / Linux Server with Clients or Linux Clients or Standalone PC(for detail, please refer Annex – I)

Software :   Unix / Linux Operating System

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PROFESSIONAL PRACTICES – III

L	T	P		Curri. Ref. No.: CSE509
0	0	2		

Total Contact Hrs.:30   **Total Marks: 50**   **Theory: 0**

Theory: 0   End Exam :0

Tutorial; 0   P.A. :0

Practical: 30   **Practical:50**

Pre-requisite: Nil   End term Exam: 0

Credit :1   P.A.:50

Practical
Total Periods: 30
Periods: 2P/W

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1	**Industrial Visit** Structural industrial visit to be arranged and report of the same to be submitted by the student to form a part of the Term Work. Industrial visit may be arranged in the relevant area / industries.	
2	**Lectures by professional / industrial experts to be arranged in any ONE of the following** • Microprocessor / Microcontroller, • Computer Networking, • PC assembling / Web Designing.	

PC UTILITIES LAB

L	T	P		Curri. Ref. No.:CSE514
0	0	4		

Total Contact Hrs.:60   **Total Marks: 50**   **Theory: 0**

Theory: 0   End Term Exam: 0

Tutorial: 0   P.A.: 0

Practical: 60   **Practical: 50**

Pre-requisite: Nil   End Term Exam: 0

Credit :2   P.A.: 50

PRACTICAL:
Total Periods: 60
Periods : 4 P/W
  .

1.   **Introduction to MS Office**
   • Basic features of MS Office,
   • Overview of different Office Tools.

2.   **Introduction to MS Word**
   • Creating and editing documents,
   • Formatting documents,
   • Working with tables,
   • Spell checking,
   • Mail merging,
   • Import graphics into Word document

3.   **Introduction to MS Excel**
   • Creating a new workbook,
   • Entering labels, values and formulae,
   • Formatting layout,
   • Working with functions,
   • Creating chart from data,
   • Working with macros.

4. Introduction to MS Power Point
- Creating a presentation,
- Adding / editing text,
- Working with Objects,
- Formatting the Presentation,
- Placing the Chart in slide,
- Importing Object from other tools,
- Slideshow and Printing

5. Introduction to MS Access
- Creation of Database,
- Creation of tables – Field declaration, data types declaration, constraints declaration.
- Working with records,
- Querying the database,
- Joining tables,
- Designing the Forms,
- Creating Reports.

6. Introduction to www
- Internet browsing and surfing,
- Use of Search Engine
- Email operations

RECOMMENDED LITERATURE:
1. Microsoft Office Manual
2. Online Manual on Microsoft Office and Internet.

LIST OF EQUIPMENT:

Hardware :   Standalone PC
              (for detail, please refer Annex – I)

Software :   Microsoft Office 2013 / 2016

Additional Service: Internet Connectivity

Sample path for Term IV in Computer Science & Engineering.

Sl. No	Code	Course	Study Scheme Pre-requisite	Contact Hours / Week L	T	P	Theory End Exam	Progressive Assessment Class Test	Assign ment	Attend ance	Practical End Exam	Progressive Assessment Sessi onal	Viva voce	Total Marks	Credit
1	CSE407	Microprocessor & Interfacing	CSE403 CSE404	3	0	2	70	15	10	5	25	25	0	150	4
2	CSE412	Computer Communication & Networking	CSE405	3	0	2	70	15	10	5	25	25	0	150	4
3	CSE406	Data structure & Algorithms	G206B, CSE402	3	0	4	70	15	10	5	25	25	0	150	5
4	CSE502	Object Oriented Methodology	CSE402	3	0	4	70	15	10	5	25	25	0	150	5
5	CSE409	Unix Operating System	CSE404	3	0	2	70	15	10	5	25	25	0	150	4
6	CSE509	Professional Practice-III	NIL	0	0	2	0	0	0	0	0	50	0	50	1
7	CSE514	PC Utilities Lab	NIL	0	0	4	0	0	0	0	0	50	0	50	2
		TOTAL		**15**	**0**	**20**	**350**	**75**	**50**	**25**	**125**	**225**	**0**	**850**	**25**