SEMESTER – VI

SEMESTER – VI

COMPUTER ARCHITECTURE EC-6001

Course Code	**EC-6001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**COMPUTER ARCHITECTURE**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

- **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
- **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed

Section-A

Basic structure of computer hardware and software - Addressing methods and machine programme sequencing - Computer arithmetic - logic design and fast adders - multiplication - Booth's algorithm - Fast multiplication - integer division - floating point numbers - Control unit - instruction execution cycle - sequencing of control signals - hardwired control – PLAs - micro programmed control - control signals - microinstructions- micro program sequencing- Branch address modification- Prefetching of microinstructions- emulation-Bit-slice processors

Section-B

Memory organization-Semiconductor RAM memories-internal organization-Bipolar and MOS devices - Dynamic memories - multiple memory modules and interleaving - cache memories - mapping functions - replacement algorithms - virtual memory - address translations - page tables memory management units - Secondary memory - disk drives - organization and operations - different standards .

Section-C

Input-output organizations - accessing I/O devices - direct memory access (DMA) - interrupts - interrupt handling - handling multiple devices - device identification - vectored interrupts - interrupt nesting - Daisy chaining - I/O interfaces - serial and parallel standards - buses - scheduling - bus arbitration - computer peripherals - printers - plotters - VDUs .

Section-D

Pipelining: What is pipelining? The Basic pipeline for DLX, the major hurdle of pipelining – pipeline hazards, what makes pipelining hard to implement?

Instruction – level parallelism: Concepts and challenges, overcoming Data Hazards with Dynamic scheduling.

Text Books :

Hamacher C V, " Computer Organization - 3rd Edition" , McGraw Hill., NewYork ,1990

References :

1) Pal Chaudhary P, "Computer Organization and Design " , Prentice Hall, New Delhi.
2) Bartee T C, "Digital Computer Fundamentals ", McGraw Hill, New York, 1977.
3) Hayes J P , "Computer Organization and Architecture - 2nd Edition ", Mc Graw Hill.
4) anenbaum A S , "Structured Computer Organization - 3rd Edition", Prentice Hall.
5) Goankar ,"Microprocessors Architecture Programming and Applications ", John Wiley.
6) Douglas V Hall ,"Microprocessors & Interfacing to 8085 Introduction to", Tata McGraw Hill.
7) Ghose Sridhar ,"Microprocessors for Engineers and Scientists"
8) Lance A Leventhal," Introduction to Microprocessors" Prentice Hall.

SEMESTER – VI
ANTENNA AND WAVE PROPAGATION EC – 6002

Course Code	**EC – 6002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**ANTENNA AND WAVE PROPAGATION**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

- **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

- **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Radiation of Electromagnetic Waves:-

Retarded potentials, Radiation from a small current element, fields of a short Dipole, Power radiated by a current element, Radiation from a half wave dipole and quarter wave monopole.

Antenna Parameters:

Antenna patterns, Isotropic Radiators, Radiation pattern, Gain, Directivity, Antenna Efficiency, Aperture, Reciprocity Theorem, Radiation resistance, Beam width.

SECTION – B

Antenna Arrays;

Arrays of two point sources, Broadside array, End fire array, Collinear arrays, Parasitic arrays, Multiplication of pattern, Linear array with 'n' point sources, Binomial arrays, Antenna gain, Antenna aperture and its relation to gain, antenna terminal impedance, antenna temperature and signal to noise ratio.

SECTION – C

Special Purpose Antennas:

Reflector type antennas, Lens antenna, V and rhombic antennas, traveling wave antennas, Yagi antenna, Slotted and horn antennas, Basic idea of wide band antennas.

Antenna Measurements:

Measurement of field strength, antenna impedance, radiation pattern, radiation resistance, gain, directivity and effective length.

SECTION – D

Plane earth reflection, space wave and surface wave, The surface wave, Elevated Dipole antennas above a plane earth, wave tilt of the surface wave, spherical earth propagation, Troposheric wave.

Ionospheric Propagation:

Reflection and Refraction of waves by the ionosphere, Regular and Irregular variation, Attenuation factor, Effect of earth's magnetic field, wave propagation in ionosphere.

Books Recommended:

1. J.D.Kraus, "Antennas", McGraw Hill.
2. F.C.Jordan & D.C.Balmann, Electromagnetic waves and radiating systems", P.H.I.
3. K.D.Prasad, "Antenna & Wave Propagation" Satya Prakashan.

SEMESTER – VI

ADVANCED MICROPROCESSOR & MICROCONTROLLERS **EC(ID) - 6003**

Course Code	**EC(ID) – 6003**	Credits : 4	L-3, T-1, P-0
Name of the Course	**ADVANCED MICROPROCESSOR & MICROCONTROLLERS**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

- **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

- **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Introduction:

Introduction to microprocessors and microcomputers, Architecture of 8086 : BIU, the queue, segment registers, instruction pointer, EU, Flag registers, addressing modes of 8086, instruction set of 8086, RAM/ROM address decoding.

SECTION – B

Programs with an assembler: Program format, segment & end directives, Data & address naming directives- EQU, DB, DW,DD, assume directives.

Programs using 8086, conditional and unconditional jump, loop and string instructions,

Interfacing of 8086 to : keyboards-alpha numeric displays and stepper motor.

SECTION – C

Microprocessor 80286 : Architecture, signal and system connection, operating modes

Microprocessor 80386, 80486: System and operating modes, RISC machines, optical computers.

SECTION – D

Microprocessors and Micro controllers:

Introduction, Microprocessors and Micro controllers, The Z80 and the 8051, four bit, Eight bit, Sixteen bit, thirty-two bit Micro controllers, Development System for Micro controllers.

The 8051 Architecture:

Introduction, 8051 Micro controller Hardware, Input/output Pins, Ports and Circuits, External Memory, Counters and Timers, Serial Data input/output, Interrupts.

Suggested Books:-

1. Microprocessor & interfacing program & Hardware Tata McGraw Hills by D.V.Hall.
2. 8088/8086 microprocessor programming, interfacing, Hardware & application: Tribel & single PHI.
3. Advanced Microprocessor & interfacing: B.Ram TMH.
4. 8086 microprocessors by B.S.Chhabra.
5. The 8051 Micro controller Architecture, programming & Applications : Kenneth J. Ayala.

SEMESTER – VI

LINEAR CONTROL SYSTEMS EC – 6004

Course Code	**EC – 6004**	Credits : 4	L-3, T-1, P-0
Name of the Course	**LINEAR CONTROL SYSTEMS**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

- **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

- **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections. A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Introduction:

The control system, historical development of automatic control system, sampled data digital control system.

Mathematical Models of Physical Systems:

Differential equation of physical systems, transfer function, block diagram algebra, signal Flow graphs.

Feedback characteristics of control systems:

Feedback and Non-feedback systems, Reduction of parameter variations by use of feedback, control over system Dynamics by use of feedback, control of the effects of Disturbance signals by use of feedback.

SECTION – B

Time Response Analysis:

Transient and steady state response, Input Test Signals, Time response of a first order and second order control systems, Steady State Error, Control Actions.

Stability:

The concept of stability, Necessary conditions for stability, Routh – Hurtwitz stability criterion.

Root Locus Technique:

The Root Locus concept, construction of root loci.

SECTION – C

Frequency Response Analysis:

Correlation between Time and Frequency Response, Polar plots, Bode plots,

Stability in Frequency Domain:

Nyquist stability Criterion, Assessment of Relative Stability using Nyquist Criterion,

SECTION – D

Compensation of Control Systems:
Phase lead compensation, phase lag compensation, phase lag – lead compensation, Feedback compensation.

State Variable Analysis:
State space Representation, the concept of state, State space Representation of Systems, Block diagram for state equation, controllability, observability.

Books Recommended:

1. "Control Systems Engineering" Nagrath & Gopal, New Age International Publishers.
2. "Linear Control Systems", B.S.Manke, Khanna Publishers.
3. "Automatic control system", KUO, PHI.

SEMESTER VI

OPERATING SYSTEM **EC-6005**

Course Code	**EC -6005**	**Credits : 4**	**L-3, T-1, P-0**
Name of the Course	**OPERATING SYSTEM**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

- **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

- **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed

Section A

What is an Operation System? Simple Batch Systems; Multiprogrammed Batched Systems; Time-Sharing System; Personal-Computer System; Parallel System; Distributed System; Real-Time Operating Systems.
System Components System Calls, System Programs; System Structure; Virtual Machines.

Process concept; Process Scheduling; Operation on processes, Cooperating Processes, Threads, Interprocess Communication
CPU Scheduling fundamental concepts, Scheduling criteria; Scheduling Algorithms; Multi-processor Scheduling; Real Time Scheduling.
Threads: Overview; Multithreading

Section B

Deadlock: System Model; Deadlock Characterization, Methods of Handling Deadlock, deadlock Prevention; Deadlock Avoidance; Deadlock Detection, Recovery from deadlock;

Protection : Goals of protection; Domain of protection;
Security : The Security Problem; Authentication; One Time passwords program Threats, System Threats;

Section C

Memory Management Logical Versus Physical Address Spacel Swapping Congiguous Allocation; Paging; Segmentation; Segmentation with paging.

Virtual Memory; Demand Paging Performance of Demand Paging page Replacement Page Replacement Algorithms; Allocation of Frames Thrashing; Demand Segmentation;
Cache memory and implementation.

Secondary Storage Structure : Disk Structure; Disk Scheduling; Disk Management; Swap-space management;

Section D

File System Interface ; File Concept; Access Methods; Directory Structure; Protection; Consistency Semantics;

File-System Interface : File Concept; Access Methods; Directory Structure; Protection; Consistency Semantics;

File System Implementation ; File System Structure ; Allocation Methods, Free Space Management Directory Implementation ; Efficiency and Performance; Recovery.

Books :

1. Abrahanm Silberschatz, Peter Baer Galvin, " Operating System Concepts " John Wiley & Sons, Inc., Vth Edition, 2000.
2. Detail H. M. "An Introduction to Operating System" Addison Wesley Publishing Co., 1984

SEMESTER - VI

MULTIMEDIA SYSTEMS **EC – 6006**

Course Code	**EC– 6006**	Credits : 4	L-3, T-1, P-0
Name of the Course	**MULTIMEDIA SYSTEMS**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

- **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

- **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed

SECTION-A:

Multimedia Communications: Introduction, multimedia information representation, multimedia networks, multimedia applications, application and networking terminology.

Multimedia information representation: Introduction, digitization principles, text, and images, audio, video.

SECTION-B*:*

Text and image compression: Introduction, compression principles, text compression, image compression. Various methods of text and image compression.

SECTION-C:

Audio and video compression: Text compression, image compression,

Various methods of audio compressions and video compressions

SECTION-D:

Enterprise networks: Introduction, LAN's, Ethernet/IEEE 802.3, token ring, bridges, FDDI, high speed LAN's, LAN protocols, multisites LAN interconnection technologies.

Text Books:

1. Multimedia Communications- Applications, Networks, Protocols & Standards by Fred Halsall., Pearson Education
2. Multimedia Communications by RALF, CLARA, Pearson Education

SEMESTER VI

ADVANCED MICROPROCESSORS LAB **EC (ID)- 6007**

Course Code	**EC (ID)-6007**	Credits : 2	L-0, T-0, P-2
Name of the Course	**ADVANCED MICROPROCESSORS LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voice examination (25 marks).

Viva-voice examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

1. Study of 8086 Microprocessor kit.
2. Write a program using 8086 for division.
3. Write a program using 8086 for:
   a) Finding largest number from an array
   b) Finding smallest number from an array
4. Write a program using 8086 for arranging an array of numbers in ascending & descending order.
5. Write a program to control the operation of stepper motor using 8086 & 8255 PPI
6. Write a program to calculate the number of bits in a string.
7. Write a program to convert data string into its 2's complement form.
8. Simple Programming on 8051 Micro controller.
9. Interfacing of 8051 with PC & downloading of program.
10. Application of 8051 as a stand alone (dedicated) controller.

SEMESTER VI

CONTROL SYSTEMS LAB EC-6008

Course Code		**EC-6008**	Credits : 2	L-0, T-0, P-2
Name of the Course		**CONTROL SYSTEM LAB**		
Lectures to be delivered		**26 hours of Lab sessions**		
Semester End Examination		**Max. Time: 3 hrs**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**		**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voice examination (25 marks).

Viva-voice examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

1. To illustrate a simple motor driven open loop position control system.
2. To demonstrate simple motor driven closed loop position control system.
3. To study and demonstrate simple closed loop speed control system.
4. To study the lag compensator and to draw magnitude and phase plots for these.
5. To draw the magnitude and phase plots for lead and lag-lead compensators.
6. To study a stepper motor and to execute microprocessor or computer based control of the same by changing number of steps, direction of rotation and speed.
7. To plot torque – speed characteristics of ac servomotor.
8. To plot torque – speed characteristics of dc servomotor.
9. To study magnetic amplifier.
10. To study synchro transmitter rotor position vs. stator voltages and the working of synchro receiver position.
11. To study second order system and obtain its time response for different damping factors.

SEMESTER VI

OPERATING SYSTEMS LAB **EC-6009**

Course Code	**EC-6009**	Credits: 2	L-0, T-0, P-2
Name of the Course	**OPERATING SYSTEMS LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner (25 marks).
ii. Viva-voice examination (25 marks).

Viva-voice examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

1. Study of DOS internal commands.
2. Study of DOS external commands.
3. Writing of Batch files in DOS.
4. Study of GUI features of Windows Operating Systems.
5. Study various settings in Windows Operating Systems (Desktop settings, control panel etc.).
6. Study of LINUX Operating systems (LINUX basic commands).
7. Study of LINUX kernel.
8. Writing of Shell Scripts in LINUX.

SEMESTER VI

MULTIMEDIA SYSTEMS LAB **EC-6010**

Course Code	**EC-6010**	Credits: 2	L-0, T-0, P-2
Name of the Course	**MULTIMEDIA SYSTEMS LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner (25 marks).

ii. Viva-voice examination (25 marks).

Viva-voice examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

1.Using available multimedia software like Photoshop, macro media, generator, flash to create

a) Backgrounds
b) Titling
c) Icons
d) Pulls
e) Buttons & Bullets
f) Menu Bars
g) Animation (Rotate, Fade, Marquee, Twirl, Morphing etc & submit a project in concentration with instruction tutor incharge.

2.Overview of Flash 5

a) Menu b) Lasso Tool c) Arrow Tool d) Pen Tool

3.Working with Drawing & Painting tool.

4.Working with Bitmap & Raster Graphics.

5.Sound & Movie

6.Understand of Action scripts.

7.3-D Graphics.

8.Animation]

9. Write a program to read a paragraph & store it in suggested format.
10. Study the Pions Notes & stimulate them using keyboard & store them in file
11. Write a program to Play Wave, Midfile.

Project:

1. Create an Animated movie In Flash
2. Create a Full Motion Video Movie in Flash.
3. Create A Post Table Game on Flash.