VII SEMESTER ELECTRONICS and COMMUNICATION ENGINEERING (T)

1. Page 1 Name of Subject 13.702 Optical Fibre Communication (T) changed to 13.702 Optical Communication (T)

2. Page 29, 30 Syllabus of 13.706.3 Embedded Systems (AT) replaced with modified contents as follows:

13.706.3 EMBEDDED SYSTEMS (AT) (Elective IV)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits:** 3

Course Objectives:

- *To have a thorough understanding of the basic structure and design of an Embedded System.*
- *To study the different ways of communicating with I/O devices and standard I/O interfaces.*
- *To study the basics of RTOS for Embedded systems.*
- *To study the programming concepts of Embedded Systems.*

Module – I

Introduction to Embedded Systems– Components of an embedded system hardware– Software embedded into the system

Embedded Processors - CPU architecture of PIC and ARM processors

Design and Development life cycle model - Embedded system design process – Challenges in Embedded system design.

Module – II

Memory - memory technologies – DRAM, SRAM, EPROM, EEPROM – Memory Organizations

I/O Devices – Timer / Counter, Real time clock, ADC and DAC, Keyboards and Displays

DMA – DMA Controllers

Interrupts and Exceptions– Interrupt Controller

Serial Communication Standards and Devices - UART and HDLC, SCI, SPI - Parallel Port Devices - I2C Bus, CAN Bus, USB Bus, ISA Bus, PCI and PCI-X Bus.

Module – III

Real Time Operating Systems –Structure of OS - Kernel - Process, tasks and threads – Process Management – Memory Management - Interrupt Handling

LINUX OS – Basic Features – File system, Disk partitioning, Software structure.

Inter Process Communication and Synchronization –Signals – Semaphore – Message Queues – Mailboxes – Pipes –Sockets – Remote Procedure Calls (RPCs).

Module – IV

Concepts of Embedded programming –Components for Embedded programs – Assembling, Linking and Loading – Compilation Techniques –Program Optimization

Software Implementation, Testing, Validation, Debugging and Emulation

Design Examples: Burglar Alarm, Software Modem, Telephone Answering Machine.

References:

1. Wayne Wolf, *Computers as Components: Principles of Embedded Computing System Design*, Morgan Kaufman Publishers - Elsevier 3ed
2. Steve Heath, *Embedded Systems Design*, Newnes – Elsevier, 2ed.
3. Tammy Noergaard, *Embedded Systems Architecture, A Comprehensive Guide for Engineers and Programmers*, Newnes – Elsevier 2ed
4. David E.Simon, *An Embedded Software Primer*, Pearson Education Asia, First Indian Reprint 2000.
5. Frank Vahid and Tony Givargis, *Embedded Systems Design – A Unified Hardware / Software Introduction,* John Wiley, 2002.
6. Rajkamal, *Embedded Systems Architecture, Programming and Design*, TMH, 2003.

Internal Continuous Assessment *(Maximum Marks-50)*

50% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, quiz, literature survey, seminar, term-project, problems based on MATLAB / any other software packages covering the syllabus etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours Maximum Total Marks: 100

The question paper shall consist of 2 parts.

Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two questions from each module and not more than three questions from any module.

Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.

Note: *Question paper should contain minimum 20 %* problems, derivations and proof.

Course Outcome:

At the end of the course, students will have

- *Thorough understanding of the basic structure and design of an Embedded System.*
- *Knowledge on the different ways of communicating with I/O devices and standard I/O interfaces.*
- *Knowledge on the basics of RTOS for Embedded systems and on programming concepts of Embedded Systems.*

3. Page 32 Course outcome changed as

Course Outcome:

After successful completion of the course, students will be able to

- *Understand the concepts of Low power microelectronics, low voltage technologies logic styles and circuits.*
- *Design chips used for battery-powered systems and high-performance circuits.*

VII SEMESTER AERONAUTICAL ENGINEERING (S)

1. Page 1. Teaching schedule and credit of 13.703 Combustion Technology (S) corrected as
13.703 Combustion Technology (S) 3(C) 2(L) 1(T) 0(P)

2. Page 1. Teaching schedule and credit of 13.707 Elective III corrected as
13.707 Elective III 3(C) 2(L) 1(T) 0(P)

3. Page 1. Total Teaching schedule and credit corrected as
29(C) 18(L) 7(T) 4(P)

4. Page 6, 14,17,20,22,24,26,29 and 31- Teaching schedule and credit corrected as
3(C) 2(L) 1(T) 0(P)

5. Page 24- Course No corrected as **13.707.5**

6. Page 33- Course Name corrected as **13.708 Avionics Lab**

VII SEMESTER BIOTECHNOLOGY & BIOCHEMICAL ENGINEERING (B)

1. Page 1- List of 13.705 Elective II – Course No and Name are rearranged as

13.705 Elective II	
13.705.1	Biostatistics (B)
13.705.2	Ethics and Intellectual Property Rights (B)
13.705.3	Bioprocess Plant safety and Hazard Assessment (B)
13.705.4	Biocatalysts and Catalysis (B)
13.705.5	Computational Fluid Dynamics (B)
13.705.6	Drug Design, Development and Manufacture (B)

VII SEMESTER APPLIED ELECTRONICS and INSTRUMENTATION ENGINEERING (A)

1. Page 29, 30 Syllabus of 13.706.3 Embedded Systems (AT) replaced with modified contents as follows

13.706.3 EMBEDDED SYSTEMS (AT) (Elective IV)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits:** 3

Course Objectives:

- *To have a thorough understanding of the basic structure and design of an Embedded System.*
- *To study the different ways of communicating with I/O devices and standard I/O interfaces.*
- *To study the basics of RTOS for Embedded systems.*
- *To study the programming concepts of Embedded Systems.*

Module – I

Introduction to Embedded Systems– Components of an embedded system hardware– Software embedded into the system

Embedded Processors - CPU architecture of PIC and ARM processors

Design and Development life cycle model - Embedded system design process – Challenges in Embedded system design.

Module – II

Memory - memory technologies – DRAM, SRAM, EPROM, EEPROM – Memory Organizations

I/O Devices – Timer / Counter, Real time clock, ADC and DAC, Keyboards and Displays

DMA – DMA Controllers

Interrupts and Exceptions– Interrupt Controller

Serial Communication Standards and Devices - UART and HDLC, SCI, SPI - Parallel Port Devices - I2C Bus, CAN Bus, USB Bus, ISA Bus, PCI and PCI-X Bus.

Module – III

Real Time Operating Systems –Structure of OS - Kernel - Process, tasks and threads – Process Management – Memory Management - Interrupt Handling

LINUX OS – Basic Features – File system, Disk partitioning, Software structure.

Inter Process Communication and Synchronization –Signals – Semaphore – Message Queues – Mailboxes – Pipes –Sockets – Remote Procedure Calls (RPCs).

Module – IV

Concepts of Embedded programming –Components for Embedded programs – Assembling, Linking and Loading – Compilation Techniques –Program Optimization
Software Implementation, Testing, Validation, Debugging and Emulation
Design Examples: Burglar Alarm, Software Modem, Telephone Answering Machine.

References:

1. Wayne Wolf, *Computers as Components: Principles of Embedded Computing System Design*, Morgan Kaufman Publishers - Elsevier 3ed
2. Steve Heath, *Embedded Systems Design*, Newnes – Elsevier, 2ed.
3. Tammy Noergaard, *Embedded Systems Architecture, A Comprehensive Guide for Engineers and Programmers*, Newnes – Elsevier 2ed
4. David E.Simon, *An Embedded Software Primer*, Pearson Education Asia, First Indian Reprint 2000.
5. Frank Vahid and Tony Givargis, *Embedded Systems Design – A Unified Hardware / Software Introduction,* John Wiley, 2002.
6. Rajkamal, *Embedded Systems Architecture, Programming and Design*, TMH, 2003.

Internal Continuous Assessment *(Maximum Marks-50)*

50% - Tests (minimum 2)
30% - Assignments (minimum 2) such as home work, problem solving, quiz, literature survey, seminar, term-project, problems based on MATLAB / any other software packages covering the syllabus etc.
20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours Maximum Total Marks: 100
The question paper shall consist of 2 parts.
Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two questions from each module and not more than three questions from any module.
Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.
Note: *Question paper should contain minimum 20 %* problems, derivations and proof.

Course Outcome:

At the end of the course, students will have

- *Thorough understanding of the basic structure and design of an Embedded System.*
- *Knowledge on the different ways of communicating with I/O devices and standard I/O interfaces.*
- *Knowledge on the basics of RTOS for Embedded systems and on programming concepts of Embedded Systems.*

VII SEMESTER MECHANICAL - STREAM - PRODUCTION ENGINEERING

1. Page No. 56 Syllabus of 13.708 CIM LAB (P) replaced with modified contents as follows:

13 .708 CIM LAB (P)

Teaching Scheme: 0(L) - 0(T) - 2(P) **Credits**: 2

Course Objective :

To provide knowledge of CNC machines and its application in manufacturing.

List of Experiments:

1. Manual part programming for CNC machines using standard G codes and M codes
2. Study and exercise on CNC Milling Machine for
   a. Profile milling
   b. Surface milling

c. Drilling and Reaming

d. Pocket milling

3. Study and exercise on CNC Lathe for

a. Plane turning

b. Taper turning

c. Thread cutting

d. Form turning

4. Programming with PLC
5. Product printing using rapid prototyping
6. Measurement with CMM
7. Robot programming for pick and place

Internal Continuous Assessment *(Maximum Marks-50)*

40% - Test
40% - Class work and Record
20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours Maximum Total Marks: 100
Questions based on the list of experiments prescribed.
80% - Procedure, calculations if any, working, accuracy/result.
20% - Viva voce
Candidate shall submit the certified fair record for endorsement by the external examiner.

Course Outcome:

At the end of the course, the students will be able to:

- *Develop and implement part programme on CNC Machines for various operations*
- *Use CAM software for NC code generation*
- *Use Coordinate Measuring Machine (CMM) for Measurement of Flat, Cylindrical and Spherical surfaces*
- *Program a Pick and Place robot*
- *Make simple components using Rapid prototyping (RP) Machine.*

2. Page No 57 corrected as Page No. 58
