AMITY UNIVERSITY
UTTAR PRADESH

Course Title : Aerospace Embedded System
Course Code : SPAC323
Course Level : UG
Credit Units : 04

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	2	--	04

Course Objectives:

The basic objective of this course is to provide students a knowledge of how the embedded systems are designed around a Microcontroller for aerospace applications

Pre-requisites:

Aerospace electronics
Introduction to Computer and Programming in C.

Course Contents/Syllabus:

	Weightage (%)
Module I : Overview of microprocessor	**25%**
Architecture of Microprocessor , its machine cycle and bus timings, memory structure and memory interfacing, instructions sets, data arithmetic and branch operations with illustrative programs	
Module II: Microcontrollers	**35%**
Overview of microcontroller processor family: Architecture, Jump, loop, call instructions, I/O port programming, addressing modes, arithmetic and logic instructions with illustrative program, timer programming in assembly language and serial port programming.	

Module III: Peripheral interfacing & signal conditioning	**20%**
Analog to Digital Converter Parallel and serial ADC , Temperature sensors (LM 34 & 35) and its interfacing with 8051 and 0804 ; stepper motor interfacing.	
Module IV: OS for embedded system	**20%**
Embedded OS e.g. RTOS, Interrupt subroutine in RTOS; ARM processor. Arduino processors	

Student Learning Outcomes (SLO):

On completion of the course the student will be able to:

- Understand the Architecture of Microprocessors & Microcontrollers.
- The students after this course will be able to design an Embedded systems for aircraft use. for aerospace applications as well as for other industry.

Pedagogy for Course Delivery: The course pedagogy will include lectures, program and practice. It also includes discussion on problems and challenges faced by operation engineers.

List of Experiments: (Any 9 experiments)

1. Add two numbers stored in consecutive memory location and save the result in the third memory location.
2. subtract two number stored in consecutive memory location and save the result in the third memory location.
3. Programme to add two 16 bytes numbers
4. Programme to multiply two numbers stored add 6200 H and 6201 H using repeated addition
5. Programme to convert Hexa decimal numbers stored in 6200 H to decimal numbers in R5, R6 and R7.
6. Programme to find in largest number in a block data of 10 number stored at RAM location 6200 H.
7. Programme to check 10 bytes of data stored at 6200 H whether it is even or odd.
8. Write a program to generate a geometric progression using microcontroller 8051.
9. Write a program to generate a square wave using microcontroller 8051.
10. Write a program to generate a delay of 5 ms using microcontroller 8051.
11. Study and implement parallel data communication by interfacing with a LCD.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/	Total
80%	20%	100%

Theory Assessment (L&T):

	Continuous Assessment/Internal Assessment				End Term Examination
Components (Drop down	**CT**	**S/V/Q**	**HA**	**Att**	**EE**
Weightage (%)	10	8	7	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Examination Scheme:

IA				EE	
PR	**LR**	**V**	**A**	**PR**	**V**
10	10	5	5	35	35

IA = Internal assessment , EE External examination

Texts & References:

- M.A .Mazidi& J. G Mazidi" The 8051 and Embedded System " PHI 2006
- David K. Simon "An embedded System Software Primer" Pearson Education.
- Real time OS " :K J Ayala
- Xilink "FPGA Programming"