Academic Course Description

BHARATH UNIVERSITY
Faculty of Engineering and Technology
Department of Electrical and Electronics Engineering
BEE603 Microprocessor And Microcontroller
SixSemester (Even semester)

Course (catalog) description

To gain knowledge in microprocessor architecture, programming and its various applications.

Credit hours& contact hours: 3 & 45 hours

Course Coordinator   :   MR.K.S.S.PRASAD

Instructors   :MR.K.S.S.PRASAD

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
MR.K.S.S.PRASAD	Third year EEE	KS 302	**04422290125**	Hod.eee@**bharathuniv.ac.in**	12.30-1.30 PM

Relationship to other courses:

Pre –requisites   **: BEE306-DIGITAL ELECTRONICS**

Assumed knowledge : To obtain knowledge about working and programming of 8085 microprocessor and 8051 microcontroller.

Following courses   : BEE027-MICROCONTROLLED BASED SYSTEM DESIGN, BEC013-AUTOMOTIVE ELECTRONICS, BE1704 VIRTUAL INSTRUMENTATION

Syllabus Contents

UNIT I   8085 PROCESSOR   9
Hardware Architecture, pinouts – Functional Building Blocks of Processor – Memory organization –I/O ports and data transfer concepts– Timing Diagram – Interrupts.

UNIT II   PROGRAMMING OF 8085 PROCESSOR   9
Instruction -format and addressing modes – Assembly language format – Data transfer, data Manipulation & control instructions – Programming: Loop structure with counting & Indexing – Look up table -Subroutine instructions - stack.

UNIT III   8051 MICRO CONTROLLER   9
Hardware Architecture, pin outs – Functional Building Blocks of Processor Memory organization –I/O ports and data transfer concepts– Instruction set-Timing Diagram – Interrupts.

UNIT IV   INTERFACING   9

 Study on need, Architecture, and interfacing, with ICs: (a)8251 –USART; (b) 8256 –Direct memory   access controller (c) 8259 programmable interrupt controller; (d) 8279 keyboard – display interface. A/D and D/A converters &Interfacing with 8085& 8051.

UNIT V   MICRO CONTROLLER PROGRAMMING & APPLICATIONS   9

Data Transfer, Manipulation, Control Algorithms& I/O instructions – Simple programming exercises, – Stepper Motor control –Washing Machine Control -.Microprocessor vs Microcontroller.

Text book(s) and/or required material

1. Krishna Kant, "Microprocessor and Microcontrollers", Eastern Company Edition, Prentice Hall of India, New Delhi, 2007.
2. R.S. Gaonkar, „Microprocessor Architecture Programming and Application", with 8085, Wiley Eastern Ltd., New Delhi, 2013.
3. Soumitra Kumar Mandal, Microprocessor & Microcontroller Architecture, Programming & Interfacing using 8085, 8086, 8051, McGraw Hill Edu, 2013.

Reference Books:

1. Muhammad Ali Mazidi& Janice GilliMazidi, R.D.Kinely „The 8051 Micro Controller and Embedded Systems", PHI Pearson Education, 5th Indian reprint, 2003.
2. N.Senthil Kumar, M.Saravanan, S.Jeevananthan, „Microprocessors and Microcontrollers", Oxford University 1Press, 2013.
3. http://nptel.ac.in/courses/108107029/

Computer usage:

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	February 2nd week	Session 1 to 18	2 Periods
2	Cycle Test-2	March 2nd week	Session 15 to 36	2 Periods
3	Model Test	April3rd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

To gain knowledge in microprocessor architecture, programming and its various applications.	Correlates to program outcome		
	H	**M**	**L**
1. Able to understand the 8 bit microprocessor architecture, interrupts and timing diagram	d,f	a,b,c,e,h,l	
2. To expertise the concepts of theory and programming of Microprocessors	d,h,i	a,b,c,e,f,g,l	
3. To understand the architecture, instruction set and programming of 8051 microcontroller	c,d,e,f,h	b,i	
4. To Understand the concept of Interfacing and to apply for real time Applications	c,d,e,f	b,g,h,i	
5. To expertise the Micro controller programming & its applications	d	f,l	c

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule

S.NO	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I	**8085 PROCESSOR**		
1.	Hardware Architecture	No	
2.	Pinouts Diagram of Processor	No	
3.	Functional Building Blocks of Processor	No	
4.	Memory organization	No	
5.	I/O ports data transfer concepts of 8085 Processor	No	T1,T2,R3
6.	Timing Diagram	No	
7.	Timing Diagram	No	
8.	Interrupts	No	
9.	Interrupts	No	
UNIT II	**PROGRAMMING OF 8085 PROCESSOR**		
10.	Instruction -format and addressing modes	No	T1,T2,T3
11.	Assembly language format	No	

12.	Data transfer, data Manipulation	No	
13.	control instructions,	No	
14.	stack.	No	
15.	Programming: Loop structure with counting & Indexing	No	
16.	Look up table, Subroutine instructions	No	
17.	Example Program	No	
18.	Example Program	No	
UNIT III	**8051 MICRO CONTROLLER**		
19.	Hardware Architecture of 8051 microcontroller	No	
20.	pin outs of 8051 microcontroller	No	
21.	Functional Building Blocks	No	
22.	Memory organization	No	
23.	I/O ports and data transfer concepts	No	T3,R1,R2
24.	Instruction set-	No	
25.	Instruction set-	No	
26.	Timing Diagram	No	
27.	Interrupts.	No	
UNIT IV	**INTERFACING**		
28.	Study on need, Architecture, interfacing	No	
29.	ICs: 8251 –USART	No	
30.	8256 Direct memory access controller,	No	
31.	8259 programmable interrupt controller,	No	T1,T2,T3,R1
32.	8279 keyboard and display interface	No	
33.	A/D Converter	No	
34.	D/A converters	No	
35.	Interfacing with 8085.	No	
36.	Interfacing with 8051.	No	
UNIT V	**MICRO CONTROLLER PROGRAMMING & APPLICATIONS**		
37.	Data Transfer, Manipulation,	No	
38.	Control Algorithms& I/O instructions	No	
39.	Simple programming exercises,	No	
40.	Simple programming exercises,	No	
41.	Stepper Motor control	No	T3,R1,R2
42.	Stepper Motor control	No	
43.	Washing Machine Control	No	
44.	Microprocessor vs Microcontroller.	No	
45.	Revision	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures

- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Video Lectures.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	05%
Cycle Test – II	-	05%
Model Test	-	10%
Attendance	-	05%
SEMINAR&ASSIGNMENT	-	05%
Final exam	-	70%

Prepared by: MR.K.S.S.PRASAD   **Dated :**

Addendum

ABET Outcomes expected of graduates of B.Tech / EEE / program by the time that they graduate:

a) An ability to apply knowledge of mathematics, science, and engineering fundamentals.

b) An ability to identify, formulate, and solve engineering problems.

c) An ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

d) An ability to design and conduct experiments, as well as to analyze and interpret data.

e) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

f) An ability to apply reasoning informed by the knowledge of contemporary issues.

g) An ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

h) An ability to understand professional and ethical responsibility and apply them in engineering practices.

i) An ability to function on multidisciplinary teams.

j) An ability to communicate effectively with the engineering community and with society at large.

k) An ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.

l) An ability to recognize the need for,and an ability to engage in life-long learning.

.

Program Educational Objectives

PEO1: PREPARATION
Electrical Engineering Graduates are in position with the knowledge of Basic Sciences in general and Electrical Engineering in particular so as to impart the necessary skill to analyze and synthesize electrical circuits, algorithms and complex apparatus.

PEO2: CORE COMPETENCE
Electrical Engineering Graduates have competence to provide technical knowledge, skill and also to identify, comprehend and solve problems in industry, research and academics related to power, information and electronics hardware.

PEO3: PROFESSIONALISM
Electrical Engineering Graduates are successfully work in various Industrial and Government organizations, both at the National and International level, with professional competence and ethical administrative acumen so as to be able to handle critical situations and meet deadlines.

PEO4: SKILL
Electrical Engineering Graduates have better opportunity to become a future researchers/ scientists with good communication skills so that they may be both good team-members and leaders with innovative ideas for a sustainable development.

PEO5: ETHICS
Electrical Engineering Graduates are framed to improve their technical and intellectual capabilities through life-long learning process with ethical feeling so as to become good teachers, either in a class or to juniors in industry.

Course Teacher	Signature
MR.K.S.S.PRASAD	

Course Coordinator   **HOD /EEE**

(MR.K.S.S.PRASAD)