Laxdu Singh Charitable Trust's (Regd.)
THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY
(Approved by AICTE, Govt. of Maharashtra & Affiliated to University of Mumbai*)
(Accredited Programmes by National Board of Accreditation, New Delhi**)
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ISO 9001 : 2008 Certified

*Permanent Affiliated UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology (w.e.f.: A.Y. 2015-16 onwards)
**1st time Accredited UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology
**2nd time Accredited UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology • Electronics Engineering (3 years w.e.f.: 01-07-2016)

TCET/FRM/IP-02/09 Revision: A

Semester Plan
(Theory)

Semester: V **Course**: EXTC

Subject: Microcontroller and Applications **Class**: TE EXTC A

Sr. No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1.	**Prerequisite course:** Digital electronics and microprocessors	4 hrs	Self learning and classroom revision	1. Morris Mano, Digital Design, Pearson Education, Asia 2002 Chapter- 1 to 6 2. A.P.Godse, D.A.Godse, "Microprocessor," Chapter- 1,2,3,4

Class Room Teaching

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1		L1.1	SOP (Theory)	M2: Projector & Laptop	10/07/2017		
2		L1.2	SOP (Class orientation)	M2: Projector & Laptop	11/07/2017		
3		L1.3	SOP (Practical)	M2: Projector & Laptop	12/07/2017		
4		L1.4	SOP(OBE)	M2: Projector & Laptop	13/07/2017		

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
5	1	L1.5	Comparison of microprocessor and microcontroller	M1: Black Board & Chalks M2: Projector & Laptop	13/07/2017	M1.1	
6	1	L1.6	Architecture and pin functions of 8051 chip controller, CPU timing and machine cycles	M1: Black Board & Chalks M2: Projector & Laptop	14/07/2017	M1.2	
7	1	L2.1	CPU timing and machine cycles continued	M1: Black Board & Chalks M2: Projector & Laptop	17/07/2017	M1.3	
8	1	L2.2	Internal memory organization, Program counter and stack	M1: Black Board & Chalks M2: Projector & Laptop	18/07/2017	M1.4	
9	1	L2.3	Input/output ports	M1: Black Board & Chalks M2: Projector & Laptop	19/07/2017	M1.5	
10	1	L2.4	Counters and timers	M1: Black Board & Chalks M2: Projector & Laptop	20/07/2017	M1.6	
11	1	L3.1	Serial data input and output	M1: Black Board & Chalks M2: Projector & Laptop	24/07/2017	M1.7	
12	1	L3.2	Interrupts, Power saving modes	M1: Black Board & Chalks M2: Projector & Laptop	25/07/2017	M1.8	
13	2	L3.3	Addressing modes of 8051	M1: Black Board & Chalks M2: Projector & Laptop	27/07/2017	M2.1	Instead of 2 lectures will be completed in 1lecture
14	2	L3.4	Instruction set of 8051	M1: Black Board & Chalks M2: Projector & Laptop	28/07/2017	M2.2	
15	2	L4.1	Instruction set of 8051 continued	M1: Black Board & Chalks M2: Projector & Laptop	31/07/2017	M2.3	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
16	2	L4.2	Instruction set of 8051 continued	M1: Black Board & Chalks M2: Projector & Laptop	1/08/2017	M2.4	
17	2	L4.3	Bit-oriented Instructions	M1: Black Board & Chalks M2: Projector & Laptop	3/08/2017	M2.5	
18	2	L4.4	Programs related to: arithmetic, logical, delay, input, output port, serial communication, and interrupts.	M1: Black Board & Chalks M2: Projector & Laptop	4/08/2017	M2.6	Instead of 2 lectures will be completed in 1lecture
19	2	L5.1	Programs related to: arithmetic, logical, delay, input, output port, serial communication, and interrupts	M1: Black Board & Chalks M2: Projector & Laptop	7/08/2017	M2.7	Instead of 2 lectures will be completed in 1lecture
20	2	L5.2	Programs related to: arithmetic, logical, delay, input, output port, serial communication, and interrupts	M1: Black Board & Chalks M2: Projector & Laptop	8/08/2017	M2.8	Instead of 2 lectures will be completed in 1lecture
21	3	L5.3	Keyboard Interfacing	M1: Black Board & Chalks M2: Projector & Laptop	10/08/2017	M3.1	
22	3	L5.4	Stepper motor and relay	M1: Black Board & Chalks M2: Projector & Laptop	11/08/2017	M3.2	
23	3	L6.1	Interfacing of ADC and DAC (0808/09)	M1: Black Board & Chalks M2: Projector & Laptop	14/08/2017	M3.3	
24	3	L6.2	Interfacing of display: LED, LCD, and seven segment display	M1: Black Board & Chalks M2: Projector & Laptop	18/08/2017	M3.4	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
25	3	L7.1	Connection to RS 232 for serial communication	M1: Black Board & Chalks M2: Projector & Laptop	24/08/2017	M3.5	
26	3	L8.1	IR based wireless communication system design	M1: Black Board & Chalks M2: Projector & Laptop	31/08/2017	M3.6	
27	4	L8.2	Fundamentals of Risc design ,Cortex A,R and M	M1: Black Board & Chalks M2: Projector & Laptop	1/09/2017	M4.1	Instead of 2 lectures will be completed in 1 lecture
28	4	L9.1	Features of ARM Microcontroller	M1: Black Board & Chalks M2: Projector & Laptop	4/09/2017	M4.2	Instead of 2 lectures will be completed in 1 lecture
29	4	L9.2	Operating Modes of ARM	M1: Black Board & Chalks M2: Projector & Laptop	5/09/2017	M4.3	Instead of 2 lectures will be completed in 1 lecture
30	4	L9.3	Registers in ARM microcontrollers	M1: Black Board & Chalks M2: Projector & Laptop	7/09/2017	M4.4	Instead of 2 lectures will be completed in 1 lecture
31	4	L9.4	Current program status register, memory management in ARM	M1: Black Board & Chalks M2: Projector & Laptop	8/09/2017	M4.5	Instead of 2 lectures will be completed in 1 lecture
32	4	L10.1	Exception, Interrupt, Vector table	M1: Black Board & Chalks M2: Projector & Laptop	11/09/2017	M4.6	Instead of 2 lectures will be completed in 1 lecture
33	5	L10.2	Addressing modes in ARM microcontrollers	M1: Black Board & Chalks M2: Projector & Laptop	12/09/2017	M5.1	
34	5	L10.3	Instruction set for data processing,	M1: Black Board & Chalks M2: Projector & Laptop	14/09/2017	M5.2	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
35	5	L10.4	Branching Instruction in ARM with examples	M1: Black Board & Chalks M2: Projector & Laptop	15/09/2017	M5.3	
36	5	L11.1	Data Processing in ARM microcontrollers	M1: Black Board & Chalks M2: Projector & Laptop	18/09/2017	M5.4	
37	5	L11.2	TEQ, TST, CMP and CMN opcodes related instructions	M1: Black Board & Chalks M2: Projector & Laptop	19/09/2017	M5.5	
38	5	L11.3	PSR Transfer (MRS, MSR) instruction sets with examples	M1: Black Board & Chalks M2: Projector & Laptop	21/09/2017	M5.6	
39	5	L11.4	Multiply Long and Multiply-Accumulate Long (MULL,MLAL)	M1: Black Board & Chalks M2: Projector & Laptop	22/09/2017	M5.7	
40	6	L12.1	Concepts of embedded system	M1: Black Board & Chalks M2: Projector & Laptop	25/9/2017	M6.1	
41	6	L12.2	Optimizing design matrices and common design matrices	M1: Black Board & Chalks M2: Projector & Laptop	26/9/2017	M6.2	
42	6	L13.1	Study of embedded systems Digital camera	M1: Black Board & Chalks M2: Projector & Laptop	3/10/2017	M6.3	
43	6	L13.2	Study of embedded systems Stepper motor controller	M1: Black Board & Chalks M2: Projector & Laptop	5/10/2017	M6.4	
44	6	L13.3	Recent microcontrollers and their applications(Arduino, raspberry pi)	M1: Black Board & Chalks M2: Projector & Laptop	6/10/2017	M6.5	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
45	7	L14.1	MCA university paper solving and practice.	M1: Black Board & Chalks M2: Projector & Laptop	12/10/2017	M7.1	
46	7	L14.2	MCA university paper solving and practice.	M1: Black Board & Chalks M2: Projector & Laptop	13/10/2017	M7.2	
Remark:: Course:	Syllabus Coverage:	Practice Session:	Beyond Syllabus:				
No. of (lectures planned)/(lecture taken):							

Bridge courses Objective: Bridging of gaps with respect to prerequisites and industry skills or to carryout research in embedded system field**. (20 Hrs / Semester / student)**

Sr . No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1	**Advanced course:** Microprocessor and microcontrollers (NPTEL Course)	12 week	Technology Based learning	https://www.youtube.com/watch?v=liRPtvj7bFU&list=PL0E131A78ABFBFDD0 2. Yogendra Gandole "A Text Book of Advanced Microprocessors and Microcontroller" 2) "Embedded C Programming and the Microchip PIC" by Richard H. Barnett

Text Books:

1. M. A. Mazidi, J. G. Mazidi and R. D. Mckinlay, "The 8051 Microcontroller & Embedded systems", Pearson Publications, Second Edition 2006.
2. Andrew Sloss, Dominic Symes, and Chris Wright, "ARM System Developer's Guide" Morgan Kaufmann Publishers, First Edition 2004.
3. Frank Vahid& tony Gavages "Embedded system design – A unified hardware / software introduction", Wiley publication, Third edition 2002.

Reference Books:

1. C. Kenneth J. Ayala and D. V. Gadre, "The 8051 Microcontroller & Embedded system using assembly & 'C' ", Cengage Learning, Edition 2010.
2. James A. Langbridge, "Professional Embedded Arm Development", Wrox, John Wiley Brand& Sons Inc., Edition 2014

Digital Reference:

1. http://nptel.ac.in/courses/Webcourse-contents/IIT-KANPUR/microcontrollers/micro/ui/TOC.htm
2. https://www.youtube.com/playlist?list=PL0E131A78ABFBFDD0

Sd- **(Ms. Rupali Mane)**	**Sd-** **(Dr. Vinitkumar Dongre)**	**Sd-** **(Dr. R. R. Sedamkar)**
Name & Signature of Faculty	Signature of HOD	Signature of Principal / Dean Academic
Date:20/07/2017	Date:20/07/2017	Date: 20/07/2017

M1: Lecture interspersed with discussions
M2: Lecture with visual annotations

Note:

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.