**Practical Plan**

**S.E. (ECS) (Semester IV)**

**Subject: Microprocessors and Microcontrollers Lab**

**Teacher-in-charge: Dr. Sapna Prabhu**

**Subject code: ECL 403**

**Academic Term: January–April 2023**

Prerequisites:

**Laboratory Outcomes:**

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

ECL 403.1: To develop programming skills for Microprocessors and Microcontrollers

ECL 403.2: To interface various devices in Microprocessor and Microcontroller systems

Relationship of Lab outcomes with program outcomes:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO 11 | PO 12 | PSO1 | PSO2 |
| ECL 403.1 |  |  | 3 |  | 3 |  |  |  |  |  |  |  |  |  |
| ECL 403.2 |  |  | 3 |  | 3 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**CO Assessment Tools:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Lab Outcomes | *Direct Method (80%)* | | | | *Indirect Method (20%)* |
| Attendance | Viva-voce | Journal Assessment | End Sem Exam | Course exit survey |
| ECL 403.1 | 10% | 20% | 20% | 50% | 100% |
| ECL 403.2 | 10% | 20% | 20% | 50% | 100% |
|  |  |  |  |  |  |

CO calculation= (0.8 \*Direct method + 0.2\*Indirect method)

Rubrics for assessing Lab Outcome with each assessment tool:

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| --- | --- | --- | --- | --- |
| Indicator |  |  |  |  |
| Timeline (3) | More than two sessions late (0) | More than one session late (1) | One session late (2) | On time (3) |
| Depth of Understanding (4) | Unsatisfactory (1) | Superficial (2) | Satisfactory (3) | Adequate (4) |
| Completeness (3) | Not submitted (0) | Major topics are omitted or addressed minimally (1) | Most major and some minor points are covered and are accurate (2) | All major and minor points are covered and are accurate (3) |

*Practical Session Plan*

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CLASS | | | | | | SE Electronics, Semester IV | | | | | |
| Academic Term | | | | | | January–April 2023 | | | | | |
| Subject | | | | | | Microprocessors and Microcontrollers | | | | | |
| *Evaluation System* | | |  | | | | | *Hours* | | *Marks* | |
| Practical Examination | | | | | -- | | -- | |
| Oral Examination | | | | | -- | | 25 | |
| Term work | | | | | -- | | 25 | |
| Total | | | | | -- | | 50 | |
| *Time Table* | | | *Day* | | *Batch* | | | *Time* | | | |
| *Tuesday* | | *D* | | | *11.15 am-1.15 pm* | | | |
| *Thursday* | | *B* | | | *9 am-11 am* | | | |
| *Title of Experiments* | | | | | | | | | | | |
| **Sr. No.** | **Title** | | | | | | **Attained COs** | | | | **Attained POs** |
| 1 | 32 Bit Addition   1. it Addition | | | | | | ECL 403.1 | | | | PO3,PO5 |
| 2 | 16 Bit Multiplication | | | | | | ECL 403.1 | | | | PO3,PO5 |
| 3 | Factorial of a number | | | | | | ECL 403.1 | | | | PO3,PO5 |
| 4 | Counting the number of ones in a number | | | | | | ECL 403.1 | | | | PO3,PO5 |
| 5 | Ascending/Descending order | | | | | | ECL 403.1 | | | | PO3,PO5 |
| 6 | Block Transfer | | | | | | ECL 403.1 | | | | PO3,PO5 |
| 7 | Hexadecimal to BCD code conversion | | | | | | ECL 403.1 | | | | PO3,PO5 |
| 8 | I/O Port programming | | | | | | ECL 403.1, ECL 403.2 | | | | PO3,PO5 |
| 9 | LCD Interfacing | | | | | | ECL 403.1, ECL 403.2 | | | | PO3,PO5 |
| 10 | Stepper Motor Control | | | | | | ECL 403.1, ECL 403.2 | | | | PO3,PO5 |
|  | | | | | | | | | | | |
| *Practical Session Plan* | | | | | | | | | | | |
| *Batch* | | *Dates* | | | | | | | *Remarks* | | |
| *Planned* | | *Actual* | | | | |
| *Experiment No. 1 :* 32 Bit Addition  Simulation of Amplitude modulation and demodulation | | | | | | | | | | | |
| D | | 24/1/2023 | | 24/1/2023 | | | | |  | | |
| B | | 2/2/2023 | | 2/2/2023 | | | | |  | | |
| *Experiment No. 2 :*16 Bit Multiplication  Simulation of Frequency modulation | | | | | | | | | | | |
| D | | 31/1/2023 | | 31/1/2023 | | | | |  | | |
| B | | 9/2/2023 | | 9/2/2023 | | | | |  | | |
| *Experiment No. 3:* Factorial of a number  Simulation of Pre-emphasis &De-emphasis | | | | | | | | | | | |
| D | | 7/2/2023 | | 7/2/2023 | | | | |  | | |
| B | | 16/2/2023 | | 16/2/2023 | | | | |  | | |
| *Experiment No. 4:* Counting the number of ones in a number  Simulation of PPM, PWM-modulation | | | | | | | | | | | |
| D | | 14/2/2023 | | 14/2/2023 | | | | |  | | |
| B | | 23/2/2023 | | 23/2/2023 | | | | |  | | |
| *Experiment No.5 :* Ascending/Descending order  Simulation of Binary modulation and demodulation of BASK | | | | | | | | | | | |
| D | | 21/2/2023 | | 21/2/2023 | | | | |  | | |
| B | | 2/3/2023 | | 2/3/2023 | | | | |  | | |
| *Experiment No. 6 :* Block Transfer  Simulation of Binary modulation and demodulation of BPSK | | | | | | | | | | | |
| D | | 28/2/2023 | | 28/2/2023 | | | | |  | | |
| B | | 9/3/2023 | | 9/3/2023 | | | | |  | | |
| *Experiment No. 7:* Hexadecimal to BCD code conversion  Simulation of Binary modulation and demodulation of BFSK | | | | | | | | | | | |
| D | | 7/3/2023 | | 7/3/2023 | | | | |  | | |
| B | | 16/3/2023 | | 16/3/2023 | | | | |  | | |
| *Experiment No. 8 :* I/O Port programming  Simulation of PPM, PWM-modulation | | | | | | | | | | | |
| D | | 4/4/2023 | | 4/4/2023 | | | | |  | | |
| B | | 6/4/2023 | | 6/4/2023 | | | | |  | | |
| *Experiment No. 9:* LCD Interfacing  Simulation of PPM, PWM-modulation | | | | | | | | | | | |
| D | | 4/4/2023 | | 4/4/2023 | | | | |  | | |
| B | | 6/4/2023 | | 6/4/2023 | | | | |  | | |
| *Experiment No. 10:* Stepper Motor Control  Simulation of PPM, PWM-modulation | | | | | | | | | | | |
| D | | 11/4/2023 | | 11/4/2023 | | | | |  | | |
| B | | 13/3/2023 | | 13/3/2023 | | | | |  | | |

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| Submitted By | Approved By |
| Dr. Sapna Prabhu | Dr. D. V Bhoir |
| Sign: | Sign: |
|  |  |
| Date of Submission: | Date of Approval: |
|  | |
| Remarks by PAC (if any) | |
|  | |
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