**PracticalPlan**

**B.E. (ECS) (Semester VII)**

Subject: Internet of Things

Teacher-in-charge: Dr. Sapna Prabhu

Subject code: ECL 702

Academic Term: July –October 2022

**Course Outcomes:**

*Upon completion of this course students will be able to:*

ECL 702.1. Interface various sensors to any IoT device and push data onto cloud.

ECL 702.2. Remotely control various devices using Blynk App and Node-red environment.

ECL 702.3. Implement IoT protocols to control devices remotely.

ECL 702.4. Implement services like Google Assistance, Adafruit I/O, IFTTT, Firebase etc in IoT.

Relationship of course outcomes with program outcomes:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO 11 | PO 12 | PSO1 | PSO2 |
| ECL 702.1 |  |  | 2 |  | 3 |  |  |  |  |  |  |  | 2 |  |
| ECL 701.2 |  |  | 2 |  | 3 |  |  |  |  |  |  |  |  | 2 |
| ECL 701.3 |  |  | 2 |  | 3 |  |  |  |  |  |  |  |  | 2 |
| ECL 701.4 |  |  | 2 |  | 3 |  |  |  |  |  |  |  |  | 2 |

Provide justification of PO to CO mapping

|  |  |  |
| --- | --- | --- |
| ECL 702.1 | PO3 | Interface various sensors to any IoT device and push data onto cloud to design solutions for complex engineering problems and design system components or processes |
| PO5 | Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools while interfacing various sensors to any IoT device and push data onto cloud |
| ECL 701.2 | PO3 | Remotely control various devices using Blynk App and Node-red environment to design solutions for complex engineering problems and design system components or processes |
| PO5 | Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools for controlling devices using Blynk and Node red |
| ECL 701.3 | PO3 | Implement IoT protocols to control devices remotely to design solutions for complex engineering problems and design system components or processes |
| PO5 | Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools while implementing Iot protocols |
| ECL 701.4 | PO3 | Implement services like Google Assistance, Adafruit I/O, IFTTT, Firebase etc in IoT to design solutions for complex engineering problems and design system components or processes |
| PO5 | Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools |

CO Assessment Tools:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Course Outcomes* |  | | | | |
| Attendance | Performance | Journal Assessment | End Sem Exam(Oral) | Course exit survey  (indirect) |
| ECL 701.1 | 10% | 30% | 10% | 50% | 100% |
| ECL 701.2 | 10% | 30% | 10% | 50% | 100% |
| ECL 701.3 | 10% | 30% | 10% | 50% | 100% |
| ECL 701.4 | 10% | 30% | 10% | 50% | 100% |
| ECL 701.5 | 10% | 30% | 10% | 50% | 100% |

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

Rubrics for assessing Course Outcome with each assessment tool:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 | | | | | | | B.E. (ECS) (Semester VII) | | | | | |
| Academic Term | | | | | | | July-October 2022 | | | | | |
| Subject | | | | | | | Internet of Things | | | | | |
| *Evaluation System* | | | |  | | | | | *Hours* | | *Marks* | |
| Practical Examination | | | | | -- | | -- | |
| Oral Examination | | | | | -- | | 25 | |
| Term work | | | | | -- | | 25 | |
| Total | | | | | -- | | 50 | |
| *Time Table* | | | | *Day* | | *Batch* | | | *Time* | | | |
| Monday | | B | | | 8.45 am-10.45 am | | | |
| Tuesday | | A | | | 8.45 am-10.45 am | | | |
| Thursday | | C | | | 8.45 am-10.45 am | | | |
| Friday | | D | | | 1.30 pm-3.30 pm | | | |
| *Title of Experiments* | | | | | | | | | | | | |
| *Sr. No.* | *Title* | | | | | | | *Attained COs* | | | | *Attained POs* |
| 1 | Interfacing DHT 11 sensor to the cloud using Thingspeak  Thingsp | | | | | | | ECL 702.1. | | | | PO5 |
| 2 | Blinking an LED connected to NodeMCU using Blynk | | | | | | | ECL 702.2 | | | | PO5 |
| 3 | Reading data from a Flex Sensor connected to Arduino | | | | | | | ECL 702.1. | | | | PO5 |
| 4 | Controlling IoT devices/sensors remotely using Node-red and Raspberry PI | | | | | | | ECL 702.1, ECL 702.2 | | | | PO5 |
| 5 | ESP8266 Voice Control With Google Assistant and Adafruit IO and IFTTT. | | | | | | | ECL 702.4 | | | | PO5 |
| 6 | Implementing Publish-Subscribe model using MQTT protocol and DHT11 sensor | | | | | | | ECL 702.3 | | | | PO5 |
| 7 | Publishing sensor data from ESP32 to AWS IoT Cloud | | | | | | | ECL 702.1. | | | | PO5 |
| 8 | Google Assistant Controlled Switch Using NodeMCU | | | | | | | ECL 702.4 | | | | PO5 |
| 9 | Google Firebase :- controlling LED using Android App | | | | | | | ECL 702.4 | | | | PO5 |
| 10 | AWS and SNS service | | | | | | | ECl 702.5 | | | | PO5 |
|  | | | | | | | | | | | | |
| *Newly added experiments* | | | | | | | | | | | | |
| 1 | | Controlling IoT devices/sensors remotely using Node-red and Raspberry PI | | | | | | | | | | |
| 2 | | Google Assistant Controlled Switch Using NodeMCU | | | | | | | | | | |
| 3 | | AWS and SNS service | | | | | | | | | | |
| 4 | | Reading data from a Flex Sensor connected to Arduino | | | | | | | | | | |
|  | |  | | | | | | | | | | |
| *Practical Session Plan* | | | | | | | | | | | | |
| *Batch* | | | *Dates* | | | | | | | *Remarks* | | |
| *Planned* | | *Actual* | | | | |
| *Experiment No. 1*  Simulation of Amplitude modulation and demodulation | | | | | | | | | | | | |
| C | | | 1/8/2022 | | 1/8/2022 | | | | |  | | |
| A | | | 2/8/2022 | | 2/8/2022 | | | | |  | | |
| B | | | 4/8/2022 | | 4/8/2022 | | | | |  | | |
| D | | | 5/8/2022 | | 5/8/2022 | | | | |  | | |
| *Experiment No. 2*  Simulation of Frequency modulation | | | | | | | | | | | | |
| C | | | 8/8/2022 | | 8/8/2022 | | | | |  | | |
| A | | | 9/8/2022 | |  | | | | | Holiday | | |
| B | | | 11/8/2022 | | 11/8/2022 | | | | |  | | |
| D | | | 12/8/2022 | | 12/8/2022 | | | | |  | | |
| *Experiment No. 3*  Simulation of Pre-emphasis &De-emphasis | | | | | | | | | | | | |
| C | | | 15/8/2022 | | 15/8/2022 | | | | | Holiday (extra) | | |
| A | | | 16/8/2022 | | 16/8/2022 | | | | | Holiday (Extra) | | |
| B | | | 18/8/2022 | | 18/8/2022 | | | | |  | | |
| D | | | 19/8/2022 | | 19/8/2022 | | | | |  | | |
| *Experiment No. 4*  Simulation of PPM, PWM-modulation | | | | | | | | | | | | |
| C | | | 22/8/2022 | | 22/8/2022 | | | | |  | | |
| A | | | 23/8/2022 | | 23/8/2022 | | | | |  | | |
| B | | | 25/8/2022 | | 25/8/2022 | | | | |  | | |
| D | | | 26/8/2022 | | 26/8/2022 | | | | |  | | |
| *Experiment No.5*  Simulation of Binary modulation and demodulation of BASK | | | | | | | | | | | | |
| C | | | 29/8/2022 | | 29/8/2022 | | | | |  | | |
| A | | | 30/8/2022 | | 30/8/2022 | | | | |  | | |
| B | | | 1/9/2022 | | 1/9/2022 | | | | | Holiday | | |
| D | | | 2/9/2022 | | 2/9/2022 | | | | | Holiday | | |
| *Experiment No. 6*  Simulation of Binary modulation and demodulation of BPSK | | | | | | | | | | | | |
| C | | | 12/9/2022 | | 12/9/2022 | | | | |  | | |
| A | | | 13/9/2022 | | 13/9/2022 | | | | |  | | |
| B | | | 15/9/2022 | | 15/9/2022 | | | | |  | | |
| D | | | 16/9/2022 | | 16/9/2022 | | | | |  | | |
| *Experiment No. 7*  Simulation of Binary modulation and demodulation of BFSK | | | | | | | | | | | | |
| C | | | 19/9/2022 | | 19/9/2022 | | | | |  | | |
| A | | | 20/9/2022 | | 20/9/2022 | | | | |  | | |
| B | | | 22/9/2022 | | 22/9/2022 | | | | |  | | |
| D | | | 23/9/2022 | | 23/9/2022 | | | | |  | | |
| *Experiment No. 8*  Simulation of PPM, PWM-modulation | | | | | | | | | | | | |
| C | | | 26/9/2022 | | 26/9/2022 | | | | |  | | |
| A | | | 27/9/2022 | | 27/9/2022 | | | | |  | | |
| B | | | 29/9/2022 | | 29/9/2022 | | | | |  | | |
| D | | | 30/9/2022 | | 30/9/2022 | | | | |  | | |
| *Experiment No. 9*  Simulation of PPM, PWM-modulation | | | | | | | | | | | | |
| C | | | 3/10/2022 | |  | | | | | Case study | | |
| A | | | 4/10/2022 | |  | | | | |
| B | | | 6/10/2022 | |  | | | | |
| D | | | 7/10/2022 | |  | | | | |
| *Experiment No. 10*  Simulation of PPM, PWM-modulation | | | | | | | | | | | | |
| C | | | 10/10/2022 | |  | | | | | Case Study | | |
| A | | | 11/10/2022 | |  | | | | |
| B | | | 13/10/2022 | |  | | | | |
| D | | | 14/10/2022 | |  | | | | |

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| Submitted By | Approved By |
| Dr. Sapna Prabhu& Prof. Shilpa Patil | Dr. D.V. Bhoir |
| Sign: | Sign:Sd/- |
|  |  |
| Date of Submission: | Date of Approval: 17/08/2022 |
|  | |
| Remarks by PAC (if any) :**Industry visit to Utopia tech will surely enhance students practical perspective of the course.** | |
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