**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:

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| --- | --- |
| *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:

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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*

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| --- | --- |
| 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 ThingspeakThingsp | 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 |
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| Remarks by PAC (if any) :**Industry visit to Utopia tech will surely enhance students practical perspective of the course.** |
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