5 Years Integrated MCA (9th Semester)

060060902: Foundations of Internet of Things

Project Guidelines

Objective: Design and develop IoT applications using communication protocols, hardware devices, cloud platform and data analytic model. Implement the robotic hand gesture motion on the tool.

Course Outcomes: Upon completion of the activity, students shall be able to

C01: Recognize and utilize IoT physical and logical design.
C02: Identify protocol as per the requirement of IoT application.
C03: Utilize hardware packages for the communication between hardware devices.
C04: Integrated cloud offerings with IoT applications.
C05: Enhance the IoT application by including Data Analytics Model.
C06: Implement the gesture reading algorithm of Robot using sensing techniques.

Programme Outcomes:

PO1: Proficiency in and ability to identify problems related to computer science as well as design and apply computational knowledge to solve them.
PO2: Ability to design, develop, test and maintain system, component, product or process as per needs and specification.
PO3: Understanding of professional and ethical role and responsibility.
PO4: Recognition of the need for and ability towards life-long learning
PO5: Knowledge of programming languages, database systems, operating systems, software engineering, web & mobile technology and relevant modern issues along with strong project development skill.
PO6: Ability to demonstrate the use of modern tools, models and languages to solve problems related to software development.
PO7: Ability to communicate effectively with a range of audiences.

Tools and Technologies:
A team must use the following computing environment to develop their project.
- Arduino or Raspberry Pi

Phase based Schedule

<table>
<thead>
<tr>
<th>Phase</th>
<th>Phase Title</th>
<th>Activities to be done by Students</th>
<th>Activities to be done by Teacher</th>
<th>Deliverable at the end of the phase</th>
<th>Related Units</th>
<th>Date of completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Requirement Gathering</td>
<td>System Understanding</td>
<td>Introd...</td>
<td>Unit 1, 2</td>
<td>At the end of 3rd week</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Project content writing...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>System designing</td>
<td>Requirement analysis and design model of</td>
<td>Hands on Python and Micro-</td>
<td>Submission of Chapter- 1 and 2 of</td>
<td>Unit 1, 2 and 3</td>
<td>At the end of 6th Week</td>
</tr>
</tbody>
</table>

Page 1 of 6

Ms. Puja Sharma
<table>
<thead>
<tr>
<th></th>
<th>Implementatio n and development</th>
<th>Hardware configuration and module building</th>
<th>Verificatio n of implement ation</th>
<th>Functioning model</th>
<th>All</th>
<th>At the end of 10th Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>Project content writing session for chapter 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Documentatio n</td>
<td>Preparation of Final Document as per the project guideline</td>
<td>Spiral bounded hard copy of the project document</td>
<td></td>
<td></td>
<td>At the end of 11th Week</td>
</tr>
</tbody>
</table>

**Project Guidelines:**

[A] General Guidelines:
- A team is expected to develop a project of approx 36 hrs.
- Course teacher shall act as a project guide.
- In project, functionalities implementation must cover 70% of the syllabus.
- A team can use any other IoT platform for implementation of the system. Student may use different supportive technology and hardware for the system development.
- Decision of Course Teacher shall be the final and team must have to obey it.
- For any query, a student can approach to the Ms. Puja Sharma.

[B] Team Formation and Problem Definition:
- A project shall be done in a team consists of 3 to 4 students only. Team shall be formed by students in a first week after commencement of semester.
- Project definition shall be approved by project committee before project definition is allocated to a team.
- The Course Teacher will assign project definition during 2nd week of the term.

[C] Reporting:
- Project team must submit the time-line of [36 x total team member] hours schedule to the guide in the 3rd week of the semester.
- Project timeline shall contain 12-14 tasks related to the project execution and duration of each task.
- Status of the timeline shall be updated by Course Teacher.
- Format of the time-line is given below:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Project Task</th>
<th>Proposed Date</th>
<th>Actual Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Start Date</td>
<td>End Date</td>
</tr>
</tbody>
</table>

- Team shall maintain a log book. Log book must be signed by respective lab teachers in each laboratory session.
**Logbook format:**
**First Page:**

<table>
<thead>
<tr>
<th>Team No:</th>
<th>Class and Division:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Title:</td>
<td></td>
</tr>
<tr>
<td>Enrollment No and Name:</td>
<td></td>
</tr>
</tbody>
</table>

**Second Page:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Enrollment No.</th>
<th>Task Done by Student</th>
<th>General Comment by Lab Teacher/Support &amp; Guidance Team</th>
<th>General Comment by Subject Teacher</th>
<th>Student Signature</th>
<th>Lab Teacher/Support &amp; Guidance Team Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;enrollment1&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;enrollment2&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;enrollment3&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;enrollment4&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation and Assessment:**

- To achieve desired quality and verify progress of the project development work, Continuous Internal Evaluation (CIE) has been adopted.
- Continuous internal evaluation shall be done on the basis of Presentation (A6) and Project Report (A5) evaluation defined by the Course Teachers as below assessment policy:

<table>
<thead>
<tr>
<th>Assessment Code</th>
<th>Assessment Type</th>
<th>Duration for each Team (Minutes)</th>
<th>Occurrence</th>
<th>Each of Marks</th>
<th>Weightage in CIE of 20 marks</th>
<th>Tentative Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5</td>
<td>Project Report &amp; Viva</td>
<td>15</td>
<td>02</td>
<td>20</td>
<td>04x02=08</td>
<td>Project Report-1: 6th week of Semester</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Project Report-2: 11th week of Semester</td>
</tr>
<tr>
<td>A6</td>
<td>Presentation</td>
<td>30</td>
<td>02</td>
<td>30</td>
<td>06x02=12</td>
<td>Presentation-1: 7th week of Semester</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Presentation-2: 12th week of Semester</td>
</tr>
</tbody>
</table>

- During presentation, a student has to bring log book. Student shall use presentation slides to explain the project work.
- Student may be asked to write the code related to the project during presentation viva.
- No make-up work shall be accepted for missed or failed presentation or project report & Viva.
- Late submission of work and project reports shall be penalized as 5% of full marks per day for maximum five days after the cutoff date. In case, if a student has failed to meet the deadlines, he/she shall receive zero marks in particular parameter.
- First presentation is evaluated by guide and second presentation is evaluated by panel.
- Project work will be evaluated on the following criteria:
  - Timeliness
Evaluation Criteria for Project Report & Viva and Presentation 1 and 2 as follow:

**Project Report & Viva -1:** It shall have included first two chapters of report as per the format discussed [E] Project Report & Submission. Evaluation based on following criteria:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Marks (20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement Analysis</td>
<td>05</td>
</tr>
<tr>
<td>Understanding of system architecture</td>
<td>05</td>
</tr>
<tr>
<td>Reporting &amp; Viva</td>
<td>10</td>
</tr>
</tbody>
</table>

**Project Report & Viva -2:** It shall have included all chapters of report as per the format discussed [E] Project Report & Submission. Evaluation based on following criteria:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Marks (20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formatting and Quality of content</td>
<td>10</td>
</tr>
<tr>
<td>Viva</td>
<td>05</td>
</tr>
<tr>
<td>Incorporate suggestion given in presentation-2</td>
<td>02</td>
</tr>
<tr>
<td>Reporting and Timeline status</td>
<td>03</td>
</tr>
</tbody>
</table>

- Evaluation Criteria for Project Presentation-1 and 2 shall be as following:

**Project Presentation – 1:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Marks (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Requirement Understanding</td>
<td>10</td>
</tr>
<tr>
<td>System Configuration</td>
<td>10</td>
</tr>
<tr>
<td>Viva including hardware knowledge</td>
<td>10</td>
</tr>
</tbody>
</table>

**Project Presentation – 2:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Marks (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept Clarity</td>
<td>10</td>
</tr>
<tr>
<td>Presentation Skill</td>
<td>07</td>
</tr>
<tr>
<td>Demonstration</td>
<td>13</td>
</tr>
</tbody>
</table>

For all presentation each team will be given 20 minutes for presentation followed by 10 minutes Viva.

**Note:** Each parameter of presentation evaluation criteria is evaluated using Viva for the same.

**[E] Project Report & Submission:**

- Project report must contain following:
  - i. **Title Page / Front Page**
  - ii. **Institute Certificate**
    [The certificate should be duly filled signed by subject teacher and program coordinator.]
  - iii. **Declaration**
    [Declaration certificate [A self-declaration regarding work originality and non-plagiarism. Declaration certificate format is given below at end of document.]
  - iv. **Acknowledgment**
  - v. **Table of Contents with page numbering**
  - vi. **List of Tables, Figures, Schemes**

1. **Ideation**
   - 1.1. Introduction of the System
   - 1.2. Project Definition
   - 1.3. Scope
   - 1.4. Acronyms, and Abbreviations
   - 1.5. Technologies to be used
2. **Delineation**
   - 2.1 Functional and non-functional requirements
2.2 System Architecture
2.3 Functional Diagram
3. Execution
   3.1 Hardware Components
   3.2 Core Module Implemented
   3.3 System Snapshot
4. Further enhancement of the Project
5. References

Guideline for Report Formatting:
- Use A4 size page with 1" margin all sides.
- Header should include Project title and footer should contain page number and enrollment numbers of all team members.
- Chapter name should be of Cambria font, 26 points, Bold.
- Main heading should be of Cambria font, 16 points, Bold.
- Sub heading should be of Cambria font, 12 points, Bold.
- Sub heading of sub heading should be of Cambria font, 12 points, Bold, Italic.
- Paragraph should be of Cambria font, 12 points.
- Line spacing - 1.5 lines, before - 0, after - 0.
- Before chapter 1, give page number in roman letter (Title Page, Project Certification Form, Acknowledgments, Table of Contents/Index with page numbering, List of Tables, Figures, Schemes and Summary/abstract of the project work).

- Team must have to submit one spiral copy of project report along with log book compulsorily in the prescribed format along with soft copy via Google drive on or before the date of final project document submission with dual approval of Course teacher and signed certificates from institute by concern authority.
- In the soft copy submission, a team has to submit soft-copy of each presentations, final project document, project code and video demonstration of working project.
- Refer following Title/front-page format.
An IoT Project entitled with

<<TITLE IN CAPITAL LETTERS>>

Submitted By,
<<Student's Name (Enrollment Number)>>
<<Student's Name (Enrollment Number)>>
<<Student's Name (Enrollment Number)>>

Guided By,
<<Subject Teacher Name>>

in partial fulfillment of the requirements
for the 9th Semester
Subject 060060902-Foundations of Internet of Things
of 5 Years Integrated Master of Computer Applications
Shrimad Rajchandra Institute of Management and Computer Application,
Uka Tarsadia University.
November, 2019.

[F] Institute Certificate:
- Institute certificate will be provided by course teacher.
- Students will get certify their project from the course teacher and endorsed by programme
  coordinator on or before last week of semester failing to which student will not be allowed to
  appear for the external examination.

[G] Declaration Certificate: Each project document must have declaration certificate page as follows:

DECLARATION

We hereby declare that the project titled "<>" is fully implemented by us. It is neither paid nor copied.
Even though, later on, in case of any infringement found for this project work, we are solely responsible
for the same and understand that as per UGC norms, the University can revoke the degree conferred to us.

Student Enrollment No, Name and Signature

Page 6 of 6

Ms. Puja Sharma