B.Tech. IV Semester – VIII

Subject Name: Internship/ Project **Subject Code: BTIC16801**

Type of course: Major project work and internship in industry

Prerequisite (if any): Fundamental knowledge of Instrumentation and Control engineering, Effective Technical Communication and Design Engineering

List of Courses where this course will be prerequisite : Not applicable

Rationale:
To enhance employability skills of the students; Industrial Internship or Project work is required. It provides practical experience in a field of Instrumentation and Control Engineering and help to reinforce theoretical knowledge gained in different courses to solve real life challenges or industrial needs.
Note: Student must submit a SoP (Statement of Purpose) to the department within 15 days of the Commencement of the semester and get the approval of the project title/internship.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
0	0	28	14	0	0	0	120	80	200

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests CA2: Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content: Final semester of Instrumentation and Control Engineering is dedicated to industry relevant Project or Industrial internship for minimum 12 weeks.

Project work (Major): Students have to undertake a minimum 12 weeks Industry defined project work in field of instrumentation and control engineering, which will help them test their theoretical knowledge gained in earlier semesters. The Project work will enhance their capacity to undertake real-life Instrumentation, control and automation engineering challenges and solve them. This will be helpful to various industries in upgrading automation, building smart cities and green technologies, applying IOT in automation & Energy conservation.

Industrial Internship: Minimum 12 weeks in an Industry to get exposure to the practical aspects of the Instrumentation and Control Engineering. During Industrial Internship Students may be encouraged to take up projects which are aimed at providing solutions by utilizing concept of Instrumentation and Control, Automation to address problems related to societal needs, improving efficiency in rural India, green technologies, utilizing non-conventional energy sources & smart cities along with all process industries. In addition, the student may also work on a specified task or project which may be assigned to him/her by industry mentor or faculty. The outcome of the Industrial Internship should be presented in the form of a report.
Guidelines for Industrial Internship:
1. To expose students to the industry environment.
2. To create competent professionals for the industry.
3. To provide possible opportunities to learn, understand and sharpen the real time technical / managerial skills required at the job.

4. To work on a problem assigned by a mentor at industry, prepare action plan and complete within time limit.
5. Exposure to the current technological developments relevant to the subject area of Internship.
6. Learn to apply the technical knowledge in real industrial situations.
7. To learn, create/prepare report for Project/Framework/research as used in industry with productive (Data in a concise form) and efficient way (with action resolution).
8. To explore possibilities of patent or research paper publications.
9. Expose students to the engineer's responsibilities and ethics.
10. To become familiarize with various materials, processes, products and their applications along with relevant aspects of quality control.
11. To strengthen industry-institute linkage and increase employability of the students.
12. Students must be able to appraise the importance of an individual / team for effective execution.

OR

Guidelines for project work (Major):

1. Do literature Survey, Industrial Survey and study relevant published literature related to project.
2. Do patent search analysis and submit PSAR (Patent Search Analysis Report)
3. Design algorithm/circuit/configuration for the project and analyze/verify through simulations software.
4. Decide implementation method and list components or parts required.
5. Point out practical difficulties faced during implementations and device to solve them.
6. Iterate design if feasible to obtain better results.
7. Optimize the project design in terms of cost, area, power, computation complexity etc.
8. Compare results of projects with other similar design specifications.
9. The project work can be a simulation of circuits/systems or hardware based on the area and the complexity of the work involved.
10. If it contains the only simulation, it shall be comprehensive. The team is expected to know the various aspects of simulation techniques in detail. The team shall explain the results obtained, in fact with all the elements and different cases.
11. Prepare project report and do presentation before department project committee.
12. Conclude the project work and suggest future work.
13. Intermediate and final seminar in presence of department project committee for review of the work done
14. To explore possibilities of patent or research paper publications

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
	10 %	**25 %**	**25 %**	**25 %**	**15 %**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

References:

AICTE Model curriculum
AICTE Internship Policy: https://www.aicte-india.org/sites/default/files/AICTE%20Internship%20Policy.pdf

Course Outcomes:

After learning the course the students should be able to:

Sr. No.	CO statement	Marks % weightage
CO-1	Undertake problem identification, formulation and solution	20 %
CO-2	Design engineering solutions to complex problems utilising a systematic approach and team work	30 %
CO-3	Communicate with industry personals & Automation experts at large in written and oral forms	20 %
CO-4	Demonstrate the knowledge and understanding of engineering principles, management principles, leadership, and entrepreneurship skills and apply them to the assigned project	15 %
CO-5	determine the social, health, environment, safety and ethical practices during the project.	15 %

Mapping with POs:

	PO 1	PO2	PO3	PO 4	PO 5	PO6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO 3
CO-1	1	2	1	1	2	2	2	1	1	1	3	3	2	2	3
CO-2	1	2	1	2	2	1	2		1	1		3	2	2	1
CO-3	1	2	2	2	3				1	1	3		3	1	2
CO-4	1	2	1	1	3				1	1	3		2	3	2
CO-5	1	2	3	1	2	3	2	2	1	1			2	2	2

List of Open learning website: Google, NPTEL, SWAYAM, MIT

List of Open Source Software: SCILAB, KEIL

FOR LAB SESSIONS:

Major Equipment Needed: Power supplies (AC/DC), soldering, PCB design, breadboard, various instruments and meters, microcontroller/digital signal controllers, PID controllers, actuators, computer systems, PLC, LabView, MATLAB/SCILAB, KEIL, etc..