CSE1904

CAPSTONE 23-24

PROJECT / INTERNSHIP

B. Tech CSE / CPS / AI and ML/AI& Robotics

CONTENT

1. **ABOUT CAPSTONE PROJECT**

DURATION: 6 MONTHS

Students who will be taking up their capstone project in other institutions or interning in industries are also required to be on campus till they report to the respective institute / industry.

Selection of Project:

Through the Capstone Project the student is expected to get prepared for engineering practice in the relevant industry. The student is expected to identify the project problem based on the knowledge and skills acquired in earlier course works and incorporating relevant engineering standards and realistic constraints that include most of the following considerations, namely, economic, environmental, sustainability, manufacturability, ethical, health and safety, social etc..

Content of the Project:

The concepts such as the principles of design, the use of engineering tools to frame engineering design concepts, and project management necessary to implement design concepts, communications and ethical responsibility will guide the students in undertaking their project work. The Project Work may involve design, analysis, modelling & simulation, experimentation & analysis, prototype, fabrication of new equipment, correlation and analysis of data, software development, etc. or a combination of these.

Expected Outcome of the Project:

1. Having a clear understanding of the subject related concepts and of contemporary issues.
2. Having an ability to design a component or a product applying all the relevant standards and with realistic constraints.
3. Having problem solving ability - solving social issues and engineering problems.
4. Having a good working knowledge of communicating in English.
5. Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice.

2. **CATEOGRIES**

1. **PAT Category (through CDC)**: Students who have secured an internship or a placement + internship through the CDC will fall under the PAT category. These students are not required to stay on campus during their project period, starting from their joining date. Please note that until the joining date, these students will be considered under the General Category, and daily attendance is mandatory. (During this period, the student is expected to work with the guide in complete a small piece of work which could be possibly submitted to a conference.)
2. **NON-PAT Category (off Campus)**: Students who have independently secured an off-campus internship, not through the CDC will fall under this category. These students should consult with their guide about their project work. If the project aligns with the capstone norms and holds a significant value, and the

company is ready to provide the code and demo, then the student shall continue the Non-PAT project as the capstone project. However, students must update their progress on a daily basis to their guide. Note that if the Non-PAT internship happens to be in the online mode, then their physical presence in the campus and meeting their guide is mandatory.

3. **NON-PAT Category + In-house (off Campus)**: Students who have independently secured an off-campus internship, not through the CDC, will fall under this category. These students should consult with their guide about their project work. If the project does not align with the capstone norms, or if the company is not ready to provide the code and demo, then the Non-PAT project would be an additional project. These students should do an in-house project that complies with the capstone norms and must update their progress on the daily basis with their guide. Note that if the Non-PAT internship happens to be in the online mode, then their physical presence in the campus and meeting their guide is mandatory.

4. **General Category (In-house)**: Students who have secured ONLY placement (NOT Internship) through the CDC, as well as students who have not secured a PAT or NON-PAT internship will fall under the GENERAL category. These students must stay on campus, meet their guide daily, and diligently work on their project.

3. INSTRUCTIONS

3.1 PAT Category (through CDC)

1. Students who have obtained an internship or a combined placement and internship through the CDC will be classified under the PAT category.
2. These students are exempted from staying on campus during their project period, which commences from their date of joining.
3. Please be aware that these students will be classified under the General Category until their joining date, and daily attendance is compulsory.
4. Students must present their joining letter to the guide before transitioning from the GENERAL to PAT category.
5. Once you have commenced your internship, please adhere to the instructions provided by the CDC.
6. Students will participate in relevant reviews until the start of their internships. For instance, if your internship begins from 15th Jan 2024, you will be undertaking the CAPSTONE project under the assigned faculty from Nov 2023 to 12th Jan 2024. (You must complete the 0th review & 1st review and fulfil all requirements up to the 1st review).
7. Even if you have not registered in VTOP under the PAT Category, your PAT / GENERAL status commences in November 2023, depending on your company's joining date.
8. If you have received an internship offer letter, you fall under the PAT Category and must register the same in VTOP.

9. If you have received an offer for an internship cum placement, you fall under the PAT Category and must register the same in VTOP.
10. If you have only received a placement offer, you fall under the General Category and must register the same in VTOP. To register under the PAT Category, a PAT internship is mandatory; a placement offer alone is not sufficient.
11. An internal Guide will be assigned to all PAT students.
12. The zeroth review must be completed by your Guide on or before 11th December 2023 if your internship has not commenced.
13. The review dates are displayed in the table below if your internship has not commenced. (Please refer to the Review Schedule)
14. It's compulsory for all the PAT Category students to meet the guide daily and provide updates on your work if your internship has not commenced.

3.2 NON-PAT Category (off Campus)

1. **NON-PAT Category follow all the Review norms and paper publication norms of General Category (In-house).**
2. The movement from General Category to **Non-PAT Internship** is restricted from 31st January 2024.
3. All the Non-PAT internships will be decided and verified by your Guide. The Guide will verify the company and the complexity of the project and meets the weightage of CAPSTONE project.
4. No website designing or web application projects or mobile application projects are entertained project having research component only will be accepted.
5. The students are requested to share all the works regarding the capstone project to the Guide and the Review Panel (if demand arises). In case of Non-PAT based capstone projects, student should ensure that the industry is willing to share confidentiality details / revealing of code / work / architecture / modules etc to be projected during the review. If not, you will be considered under **NON-PAT Category + In-house (off Campus)**
6. If your NON-PAT internship does not meet the above criteria, you will need to undertake a separate project that satisfies the capstone norms considering under **NON-PAT Category + In-house (off Campus)**.
7. All Non-PAT students will follow the exact protocols and guidelines given to the General Category students.
8. Paper Publication in the Scopus Indexed Journal / Scopus Indexed Conference / SCI is mandatory.
9. The different stages of the work towards Journal publication will be assessed in every review.
10. If NON-PAT Internship is in ONLINE mode students must stay on campus, meet their guide daily.
11. If NON-PAT Internship is in OFFLINE mode students must update their work daily to the guide.

3.3 NON-PAT Category + In-house (off Campus):

1. **NON-PAT Category + In-house (off Campus) follow the norms of General Category (In-house).**
2. Non-PAT based capstone projects; student should ensure that the industry is willing to share confidentiality details / revealing of code / work / architecture / modules etc to be projected during the review. If not, you will be considered under **NON-PAT Category + In-house (off Campus).**
3. If your NON-PAT internship does not meet the capstone criteria, you will need to undertake a separate project that satisfies the capstone norms considering under **NON-PAT Category + In-house (off Campus)**.
4.
5. The movement from General Category to **Non-PAT Internship** is restricted from 31st January 2024.
6. All the Non-PAT internships will be decided and verified by your Guide. The Guide will verify the company and the complexity of the project and meets the weightage of CAPSTONE project.
7. No website designing or web application projects or mobile application projects are entertained project having research component only will be accepted.
8. The students are requested to share all the works regarding the capstone project to the Guide and the Review Panel (if demand arises). In case of Non-PAT based capstone projects, student should ensure that the industry is willing to share confidentiality details / revealing of code / work / architecture / modules etc to be projected during the review. If not, you will be considered under **NON-PAT Category + In-house (off Campus)**
9. All Non-PAT students will follow the exact protocols and guidelines given to the General Category students.
10. Paper Publication in the Scopus Indexed Journal / Scopus Indexed Conference / SCI is mandatory.
11. The different stages of the work towards Journal publication will be assessed in every review.
12. If NON-PAT Internship is in ONLINE mode students must stay on campus, meet their guide daily.
13. If NON-PAT Internship is in OFFLINE mode students must update their work daily to the guide.

3.4 General Category (In-house):

1. There will be 5 reviews for the capstone project for General Category students, (Note: General Category includes Non-PAT category as well).
2. Even though if any of you have not registered for CAPSTONE project in VTOP this semester under general category still your CAPSTONE starts in the month of November 2023.
3. The zeroth review will be conducted in the month December 2023 by your Guide.
4. The review dates are shown in the table below. (Refer the Review Schedule)
5. All the 4 reviews will be conducted in the **offline** mode.
6. The movement from General Category to **Non-PAT Internship** is restricted from 31st January 2024.
7. No website designing or web application projects or mobile application projects are NOT entertained, project having research component only will be accepted.
8. Paper Publication in the Scopus Indexed Journal / Scopus Indexed Conference / SCI is mandatory for all General Category students.
9. The different stages of the work towards Journal publication will be assessed in every review.

4. REVIEW PROCEDURE:

REVIEWS	TYPE	SUBMISSONS	MARKS PERCENTAGE
ZEROTH REVIEW	GUIDE REVIEW	Problem formulation	5
1ST REVIEW	PANEL REVIEW	Literature survey & Design of the proposed methodology	20
2ND REVIEW	PANEL REVIEW	70% Implementation of the proposed Methodology and Results Discussion	20
Pre-FINAL REVIEW	GUIDE REVIEW	The manuscript submission to the Journal/filing a patent out of the capstone project before Viva-Voce.	30
FINAL REVIEW	PANEL REVIEW	Complete presentation with code and demo	25
TOTAL			100

5. Pre-FINAL REVIEW BREAK-UP MARKS:

COMPONENTS	MARKS
REPORT (THESIS) SUBMISSION	10
Manuscript • Manuscript under preparation – 5marks • Manuscript submission to guide – 15 marks • Manuscript communicated to journal / conference – 20 marks	20
TOTAL	30

NOTE: The final paper should be communicated to the journal on or before 10th March 2024. The same will be followed by the guide for further publication.

6. REVIEW SCHEDULES:

Review	Project Status	Date
Zeroth Review by Guide	Problem Domain Background of the Problem Area of the Project	**On or Before 11th December 2023**
Review 1 by Panel	The progress of work will be reviewed and the content of the presentation to be showed is referred below. Review will be conducted offline	**10th January 2024 10:00 AM to 3:00 PM**
Review 2 by Panel	The progress of work will be reviewed and the content of the presentation to be showed is referred below. Review will be conducted offline.	**BCE 14th February 2024 11:00 AM to 1:30 PM** **BAI, BPS, BRS 15th February 2024 11:00 AM to 1:30 PM**
Thesis Preparation & submission for plagiarism check and Guide marks	Submission of the report and the rough draft of the Scopus	on or before 10th March 2024.
Pre-Final Review by guide	Thesis submission and research paper communication proof	**On or before 25th March 2024**
Review 3 - Final Viva Voce by Panel	Presentation of entire work to panel members.	**Tentatively April 2024, exact dates and time will be communicated later.**

7. RESEARCH PUBLICATION INSTRUCTIONS:

1. Follow the instructions of guide in writing the research paper.
2. Paper Publication in the Scopus Indexed Journal / Scopus Indexed Conference / SCI is mandatory / Patent
3. Communication of the above should be on or before 20th March 2024.

8. REVIEW PPT PREPARATION:

**Outline of Presentation for Reviews for CAPSTONE
(Minimum Requirements)**

The guidelines for the presentation of the review which is given below is the minimum requirements

Your guide can always enhance/add/update the presentation according to their choice.

A. Zeroth review:
PPT Preparation:

First Slide: TITLE, REGNO, YOURNAME, AND YOUR GUIDE NAME WITH PREFIX AS Dr.

Second Slide: Outline

Third Slide onwards

- Area of the Project
- Background of the Problem
- Problem Statement

REVIEW I:

1. Introduction

a) Statement of Problem/Challenges (Research Question)
b) Background, Context, and Significance of Study

2. Literature Review

- Minimum of 15 latest papers from reputed journals/conferences
  - Themes Discovered in Review
  - Identification of Gaps based on current scenario/industry trends

3. Problem Statement

4. Research Challenges

5. Research Objective

6. Methodology

A. Modules/Algorithms/Functionalities/Protocols

B. Data Collection Approaches/Strategies

a) Advantage of Strategy
b) Limitation of Strategy
c) Potential Risk
d) Ethical Issues about collection upon the Subjects/Participants C. Data Analysis Approaches

7. Proposed System

a) Proposed System Introduction (1 Slide)
b) Proposed System Diagram (1 slide) - Drawn by the student in WORD/PPT
c) List of modules (1 Slide)
d) Explanation of all the modules one by one which includes the Algorithm(s) (3-6 Slides)

8. What is to be done next (1 Slide)

9. Research Paper Status

10. Guide Approval mail snapshot

11. References

REVIEW II:

PPT Preparation:
First Slide: TITLE, REGNO, YOURNAME, AND YOUR GUIDE NAME WITH PREFIX AS Dr.
Second Slide: Outline
Third Slide onwards

1. Introduction (1 - 2 Slides)
2. Problem Statement (1 Slide)
3. Research Objective(s) (1 Slide)
4. Proposed System

4.1 Proposed System Introduction (1 |Slide)

4.2 Proposed System Diagram (1 slide) - Drawn by the student in word/ppt

4.3 List of modules (1 Slide)

4.4 Explanation of all the modules one by one which includes the Algorithm(s) (3- 4 Slides)

5. 70% Implementation with the results (which includes - Tables (Use MS Word/Excel), Graphs (Use Excel / any other appropriate tool/ simulator results), Equations must be written using equation editors (no snapshots, Explanation, etc.). Results, Findings, Interpretation, and Discussion - (1-4 Slides)
6. What is to be done next / remaining (1 Slide)
7. Guide Approval mail snapshot
8. Research Paper Status
9. References

FINAL REVIEW:

PPT Preparation:
First Slide: TITLE, REGNO, YOURNAME, AND YOUR GUIDE NAME WITH PREFIX AS Dr.
Second Slide: Outline

1. Introduction (1 - 2 Slides)
2. Problem Statement (1 Slide)
3. Research Objective(s) (1 Slide)

4. Proposed System
4.1 Proposed System Introduction (1 |Slide)
4.2 Proposed System Diagram (1 slide) - Drawn by the student in word/ppt
4.3 List of modules (1 Slide)
4.4 Explanation of all the modules one by one which includes the Algorithm(s) (3- 4 Slides)
5. 100% Implementation with the results (which includes - Tables (Use MS Word/Excel), Graphs(Use Excel / any other appropriate tool/ simulator results), Equations must be written no snapshots, Explanation, etc).   Results, Findings, Interpretation, and Discussion - (1-4 Slides)
6. Conclusion and Future Work
7. Guide Approval mail snapshot
8. Research paper submitted status/published
9. References

NOTE: Project Report to be carried to the review