PRESENTATION ON

CAPSTONE PROJECT FOR CSE PROGRAM

Presented By:

Dr. M. Firoz Mridha
Associate Professor
Dept. of CSE
BUBT.

Outline

- Introduction & Definition of Capstone Project
- Mapping in CSE Syllabus
- Course Design & Conduction
- Timeline
- Evaluation Process
- CO and PO attainment
- Challenges

Introduction

- Capstone meaning: A stone fixed on top of something, typically a wall, that is **top and last stone** .

- Similarly, a capstone course is usually the **peak and last experience** for students in a higher education program.

- Generally a capstone course may have been viewed as a **"finishing touch"** to provide students with the needed information or skills before graduation, hence the name "capstone".

Definition

- Capstone courses and experiences are the "**culminating experiences** in which students synthesize subject-matter knowledge they have acquired, integrate cross-disciplinary knowledge, and connect theory and application in preparation for entry into a career."

- Can be of two types:

  - In-house project within department over a research topic.

  - Real-time project carried out at an industry over a real-time industry problem.

BAETE CRITERIA

4.6 Curriculum and Teaching-Learning Processes

"There should be a final year design project or capstone project extending over a period of one year that represents a culminating demonstration of the program outcomes (POs) at the level of solving complex engineering problems."

Designing Capstone Project for CSE Program

Target Course : **CSE-498 (Thesis/Project)**

Duration : 3 Semesters (12+12+12 weeks)

Credit Hour: 4.0

Effective evaluation of the student is done based on rubrics which are mapped to the course outcomes

Assessment of course outcome (COs) and program outcome (POs) attainment are used to improve upon the future delivery of the course

Capstone Project Course Outcome

Students should be able to -

CO1: Identify, analyze and formulate a problem and use project management skill, appropriate computing and engineering tools for obtaining its solution considering potential of social and environmental impact while working in a team.

CO2: Design and implement a computer-based system, process, or program to translate a real-life problem into an engineering solution.

CO3: Assess professional, ethical, environmental, and social impacts and responsibilities of the designed project.

CO4: Present designed project results through written technical documents, oral presentations and on demonstrations.

CO-PO Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	Y	Y	Y	Y	Y				Y			
CO2				Y	Y							Y
CO3					Y	Y	Y	Y				Y
CO4								Y		Y	Y	

Capstone Project Domain

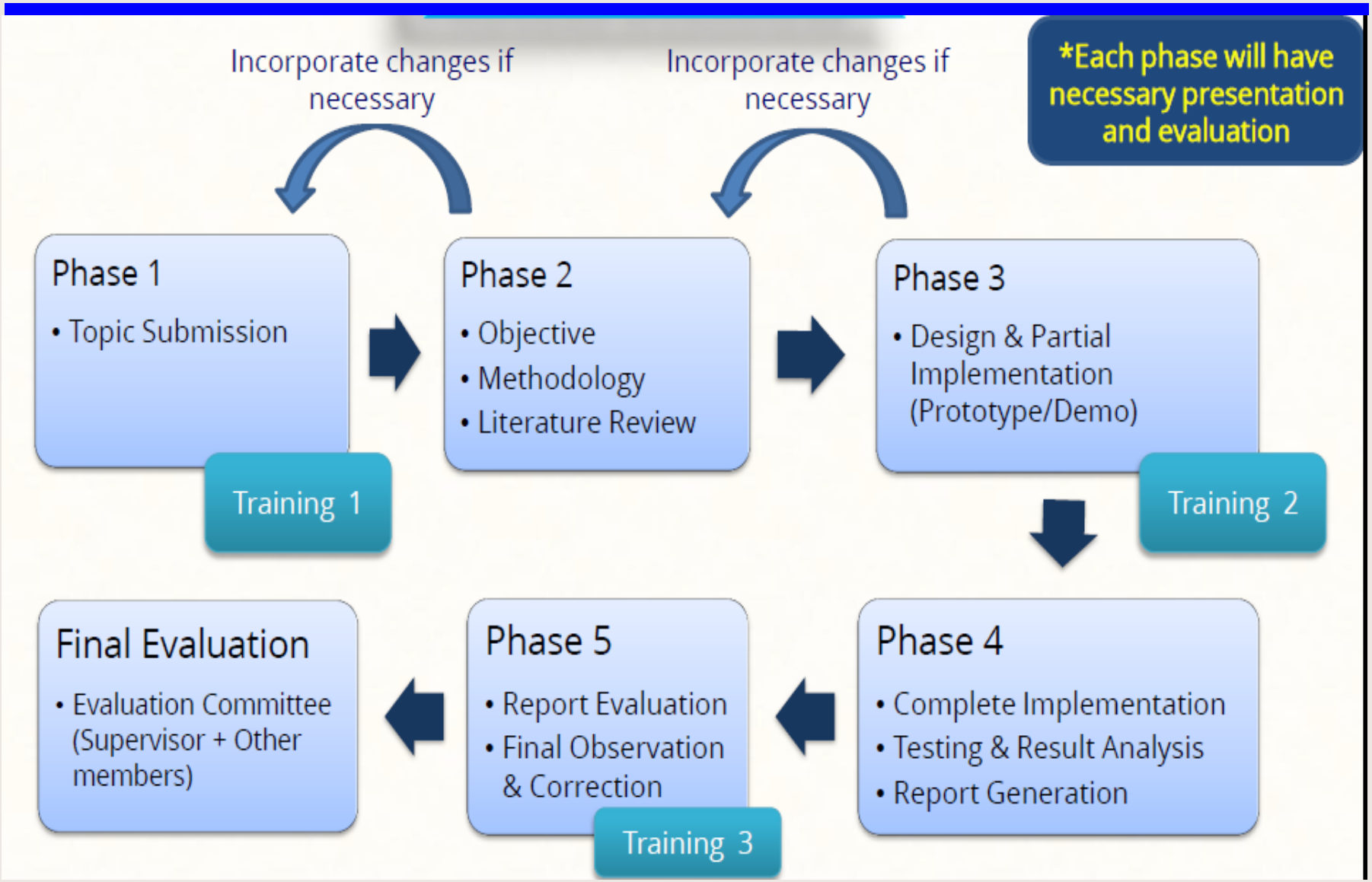
- Theoretical CS and Algorithms
- Networking
- Database and Data Mining
- Cloud Computing and Big Data
- AI and Robotics
- Computer Vision
- Information Security
- Pattern Recognition
- Internet of Things (IoT)
- Human Computer Interactions (HCI)

Capstone Project Idea Generation

- For in-house projects, the topics/problems are collected both from the faculty members and students. The students then make groups and select topics from the list.

- Students may option for a live industry project. The projects/problems may be brought in by department/students. Once these processes are done, students will finalize their topics which will be intimated to the concerned industry.

Capstone Project Process Overview



Time Line

	Weeks	Phase	
1st Semester	1-2	Interactive Lecture session on Capstone Project and Research methodology	
	3-4	Phase 1 – Topic Selection and Project Plan	
	5-6	Phase 2 – Literature Review	
	7-8	Phase 2 – Literature Review	
	9-10	Phase 2 – Tentative Methodology, Analysis and Modeling	
	11-12	Phase 3 – Evaluation and Feedback	

Time Line

	Weeks	Phase	
2nd Semester	1-2	UML Diagram, Data Flow Diagram and GitHub Collaboration Tools	
	3-4	Phase 3 – Detailed Design Submission	
	5-6	Phase 3 – Detailed Prototype Submission	
	7-8	Phase 2 – Tentative Methodology, Analysis and Modeling	
	9-11	Phase 2 – Prototype Design	
	11-12	Phase 4 – Evaluation and Feedback (By Supervisor)	

Time Line

	Weeks	Phase	
3rd Semester	1-2	Phase 4 – Complete Implementation, Unit testing and integration testing with verification	
	3-4	Feedback and Improvement	
	5-6	Motivation buildup on documentation ethics	
	7-8	Result Analysis and Performance Evaluation	
	9-11	Phase 5 – Final Report Writing	
	12	Presentation and Final Evaluation	

Evaluation Process

- Phase 1 – Topic Submission
-
- Phase 2 – Methodology and Project Plan
-
- Phase 3 – Prototype Design
-
- Phase 4 – Implementation
-
- Phase 5 – Report Submission

Each phase has specific criteria to assess. Thus rubrics are formed for each phases.

Final Year Capstone Project

- The final year project is a requirement for a students to graduate
- It is a large project encompassing 3 distinct parts:
  - Research Paper (to be completed with Course teacher)
  - Hands-on Project (to be completed with Supervisor)
  - Final Presentation complete with demonstration of project, presented in front of a defense board

Initial Student Reactions to the words "Project" and "Research"

Initial Student Reactions to the words "Capstone Project"

Capstone Project

- Students must decide on a hands-on project to be completed in their final year.
- For example, a student with AI track might develop a project that cover the complex engineering problem.

From Project to Paper

- In addition to the project decided on in lab, students must then, select an in-depth research topic relating to the project of their choice.
- The same student with the deep learning model wrote on the topic of advancements in image processing.

Expectations, cont'd

- Must be written to APA standards
- Students will be expected to complete:
  - Cover page
  - Abstract
  - Outline
  - Paper
  - Bibliography Page (Works Cited/References)

Topic Selection

- Each student must choose a unique topic
  - No two groups can do the same research topic
- How do you get your topic?
  - First, research TWO topics.
    - You must complete 3 research forms for EACH topic
    - After this is completed, your teacher will review and together, you will decide on the best topic to research.
      - Supervisor will sign off on final topic

Topic Selection, cont'd

- You WILL NOT get your topic approved until you have completed three research forms (Internet or Print) for EACH of the two topics.
  - We suggest to focus and use your time wisely in class to make sure you get the topic you want before someone else does.

Where to find Journals or conferences?

- You can look in the following places for journals or magazines:
  - Media Center
  - Local Libraries
  - Kent State Libraries
  - Your lab instructor

Final Reaction to completing Capstone projects


Any Questions?