

# CSE 5911: Capstone Design: Software Applications

## Course Description

Capstone design project: application of software engineering techniques, methodologies and technologies in software lifecycle activities using enterprise software frameworks; teamwork, written and oral communication.

**Prior Course Number:** CSE 758, CSE 762

**Transcript Abbreviation:** Cpstn: SW Apps

**Grading Plan:** Letter Grade

**Course Deliveries:** Classroom

**Course Levels:** Undergrad, Graduate

**Student Ranks:** Senior, Masters, Doctoral

**Course Offerings:** Autumn, Spring

**Flex Scheduled Course:** Never

**Course Frequency:** Every Year

**Course Length:** 14 Week

**Credits:** 4.0

**Repeatable:** No

**Time Distribution:** 1.0 hr Lec, 3.0 hr Lab

**Expected out-of-class hours per week:** 8.0

**Graded Component:** Lecture

**Credit by Examination:** No

**Admission Condition:** No

**Off Campus:** Never

**Campus Locations:** Columbus

**Prerequisites and Co-requisites:** (CSE 2501 or CSE 5501 or CSE 601) and (CSE 3901 or CSE 3902 or CSE 4901 or CE 4902 or CSE 560) and (CSE 3231 or CSE 5231 or CSE 757)

**Exclusions:** Not open to students with credit for CSE 758 or CSE 762

**Cross-Listings:**

**Course Rationale:** Existing course.

**The course is required for this unit's degrees, majors, and/or minors:** No

**The course is a GEC:** No

**The course is an elective (for this or other units) or is a service course for other units:** Yes

**Subject/CIP Code:** 14.0901

**Subsidy Level:** Doctoral Course

## Programs

Abbreviation	Description
BS CSE	BS Computer Science and Engineering
MS CSE	MS Computer Science and Engineering
PhD CSE	PhD Computer Science and Engineering

## Course Goals

Master synthesizing and applying prior knowledge to designing and implementing solutions to open-ended computational problems while considering multiple realistic constraints.
Master deadline driven software design and development in a team setting for an open-ended problem.
Be competent in evaluating design alternatives.

Be competent with issues of teamwork, project scheduling, individual and group time management.
Be competent with presenting work to an audience of peers.
Be competent with techniques for effective oral and written communication for a range of purposes.
Master principles of structured and agile software eng. frameworks, specifically methodologies for requirements identification, analysis, architecture, design, deployment, testing, and project management.
Be competent with application of structured & agile software eng. frameworks, specifically methodologies for requirements identification, analysis, architecture, design, deployment, testing, and project management.
Be familiar with frameworks for analyzing the business context of enterprise IT systems, the concept of Business-IT alignment and related issues, and Enterprise Architecture frameworks for analyzing and achieving Business-IT alignment.
Be competent with the application of at least one industry-standard technology framework.
Be competent with professional and formal presentations and communications to a varied set of stakeholders customers, peers and superiors.

## Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Course overview and project guidelines	1.0							
Project selection and team formation	1.0							
Software engineering methodology selection, High-level project plan consisting of high-level requirements, analysis, architecture, risk plan and acceptance plan. Development and target environment set up	6.0		10.0					
Student presentations and demos of current progress	2.0		10.0					
In-class team project design and development time			10.0					
Midterm presentation	1.0		4.0					
Final presentation	2.0		6.0					
Poster presentation	1.0		2.0					

## Representative Assignments

Inception phase checkpoint: Process, requirements, technology demonstration, risk management plan.
Weekly status presentations (aka standup meetings)
Elaboration phase checkpoint.
Final checkpoint - completion of project.
Poster presentation.

## Grades

Aspect	Percent
Homeworks	10%
Group project (split into 5 milestones)	70%
Technology team presentations	20%

## Representative Textbooks and Other Course Materials

Title	Author
<i>Software Engineering, A Practitioners Approach, McGraw-Hill Publications</i>	Roger Pressman

<b>Title</b>	<b>Author</b>
<i>Software Engineering, Prentice-Hall Publications</i>	Ian Sommerville
<i>Developing Object-Oriented Software, An Experience-Based Approach</i>	IBM Object-Oriented Technology Center

### ABET-EAC Criterion 3 Outcomes

<b>Course Contribution</b>		<b>College Outcome</b>
**	a	An ability to apply knowledge of mathematics, science, and engineering.
*	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
***	c	An ability to design a system, component, or process to meet desired needs.
***	d	An ability to function on multi-disciplinary teams.
***	e	An ability to identify, formulate, and solve engineering problems.
**	f	An understanding of professional and ethical responsibility.
***	g	An ability to communicate effectively.
*	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
***	i	A recognition of the need for, and an ability to engage in life-long learning.
**	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### BS CSE Program Outcomes

<b>Course Contribution</b>		<b>Program Outcome</b>
***	a	an ability to apply knowledge of computing, mathematics including discrete mathematics as well as probability and statistics, science, and engineering;
*	b	an ability to design and conduct experiments, as well as to analyze and interpret data;
***	c	an ability to design, implement, and evaluate a software or a software/hardware system, component, or process to meet desired needs within realistic constraints such as memory, runtime efficiency, as well as appropriate constraints related to economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability considerations;
***	d	an ability to function on multi-disciplinary teams;
***	e	an ability to identify, formulate, and solve engineering problems;
**	f	an understanding of professional, ethical, legal, security and social issues and responsibilities;
***	g	an ability to communicate effectively with a range of audiences;
*	h	an ability to analyze the local and global impact of computing on individuals, organizations, and society;
***	i	a recognition of the need for, and an ability to engage in life-long learning and continuing professional development;
***	j	a knowledge of contemporary issues;
***	k	an ability to use the techniques, skills, and modern engineering tools necessary for practice as a CSE professional;
***	l	an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
***	m	an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
***	n	an ability to apply design and development principles in the construction of software systems of varying complexity.

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