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CS 491: Senior Project

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Recommended Citation
Eljabiri, Osama, "CS 491: Senior Project" (2023). *Computer Science Syllabi*. 310.
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CS491 Senior Project Capstone Syllabus

Fall 2023

Course Modality:
This non-traditional course focuses on real-world project-based learning pedagogies and will be conducted face-to-face and online through platforms such as WebEx, Canvas, and Discord. Regular class meetings will only take place during the first three weeks, as students will spend the rest of the semester working on projects, meeting with their teams at least once a week, and using the SCRUM methodology to complete their work. Progress will be monitored, and support will be provided throughout the process. Saturdays will be reserved for major events like the Open House and Showcase, where students will present their final projects. While there are some classes and events that everyone will attend, the schedule for the rest of the semester will depend on the type of project a student is working on, which will be determined within the first two weeks of the semester.

Instructor Information

Instructor	Email	Office	Office Hours
Osama Eljabiri	Osama.eljabiri@njit.edu	GITC 4210	During Fall 2023, I am available an hour before each Tuesday and Thursday classes and daily via Discord.

I will respond to all emails/Discord messages within 24 hours. Assignments and class activities will be graded weekly.

General Information

Course Description

The CS/IT Capstone Project is intended to provide a real-world project-based learning experience for seniors in the computer science and IT undergraduate degrees. The overall objectives of this course are to investigate the nature and techniques of a business and computing development project. Projects are either provided by industry partners, capstone enterprise or proposed by students who wish to become entrepreneurs or coaches.

Entrepreneurship projects (student startup teams) are intended to build a foundation for real-world businesses. Expert judges review student startup teams' project proposals before approval. Startup teams will conduct market research, target real-world stakeholders and validate solutions using quantitative analysis based on customers' feedback via questionnaires.

The course involves business analysis, business modeling, project management, feasibility analysis, risk analysis, R&D, requirements engineering, system design, implementation, quality assurance, documentation and Presentation of a real-world business problem and solution. The course is interdisciplinary, where students use their collective knowledge in business and technology to provide creative solutions in collaboration with real-world project stakeholders.

Prerequisites/Co-requisites

Senior standing. An opportunity for students to integrate the knowledge and skills gained in previous information technology work into a real-world team-based project. The project involves the investigation of current literature and the implementation of either a part of an extensive application or the whole of a small system.

Course Features and Learning Outcomes A-

Features:

This course has unique features not currently offered through other classes on campus. These features are:

- It provides hands-on, multidisciplinary, real-world experiences integrating business applications with information technology such as multimedia and network security.
- It strengthens the 4-year college curriculum by enabling students to use what they learn collectively and creatively.
- It simulates the real-world environment internally in the structure of students' teams and course "virtual organization."
- It offers dynamic market-driven training that reflects hot topics highly demanded by the industry but not usually covered through a static college curriculum.
- It enables students to master career-oriented skills such as leadership, Presentation, entrepreneurship, and social and communication skills.
- It shows how IT and business knowledge are used to solve real-world IT problems.
- The experience gained working on such projects will make students more employable in industry, including building businesses through the entrepreneurship track.

B- Specific goals for the course

Students who complete this course successfully will have:

- Ability to break down complex problems into manageable pieces (using WBS and Gantt).
- Ability to identify project risks and suggest strategies to minimize them.
- Ability to define project stakeholders, scope & requirements (including using FDD).
- Ability to capture, map, and visualize the design of the proposed solution, identifying key components and their relationships (examples: class diagram, ERM, network diagram, system architecture, etc.)
- Ability to implement the solution successfully using software and/or hardware technologies or other project-related tools (via prototypes).
- Ability to test (validate and verify) the quality of the executed solution using user feedback and further testing techniques.
- Ability to communicate a value proposition of the project to various stakeholders, including the ability to explain, convince, engage and impress.
- Ability to organize the Presentation meaningfully and professionally, including mastering personal and collaboration presentation skills.

Accordingly, the general outcomes of this course include:

(a) An ability to apply knowledge of computing and mathematics appropriate to the discipline
(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
(d) An ability to function effectively on teams to accomplish a common goal
(e) Ability to apply of professional, ethical, legal, security and social issues and responsibilities
(f) Ability to communicate effectively with a range of audiences
(h) Ability to engage in continuing professional development
(i) An ability to use current techniques, skills, and tools necessary for computing practice. (k) An ability to apply design and development principles in constructing software systems of varying complexity.

Required Materials No textbook is required.

Grading Policy

Final Grade Calculation

Final grades for all assignments will be based on the following percentages:

Capstone Evaluation			
	Quantity	Per Item	Total
Attendance in class/in-team, including participation and overall professionalism	N/A	N/A	130
Scope and Gantt	1	50	50
Progress Reports	4	30	120
Midterm Presentation	1	100	100
Final Presentation	1	200	200
Sponsor Evaluation	1	300	300
Final Report	1	100	100
		Total	1000
		Extra Credit Max	100
		Maximum Points	1100

Course Work

Project assignments, Final Report and Progress reports (35% of grade) Project sprints deliverables, final project paper, and progress reports are required to meet project expectations and report team status, including evaluating team members' commitment, performance and collaboration.

Midterm and Final Presentations: (30% of grade) This will be a midterm and end-of-semester presentation to examine the knowledge and skills you have mastered throughout the course.

Project Sponsor Evaluation (35% of grade) This is the stakeholders' evaluation of the overall project performance (individual and team-based) on the semester-long project.

If this is a startup team, they should develop a questionnaire, collect feedback data, formulate hypotheses and test them statistically to substantiate hypotheses and state conclusions.

Letter to Number Grade Conversions

A	90-100
B+	85-89
B	80-84
C+	75-79
C	70-74
D	65-69
F	0-64

Policy for Late Work

You must submit your coursework on time according to the posted deadlines. There is a 5% penalty for every day you are late in submitting an assignment. After the fifth day, the last assignments will not be accepted. If there is an excusable reason by the Dean of students, this will be dealt with on a case-by-case basis.

Academic Integrity

"Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that which you are working. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the NJIT academic code of integrity policy.

Please note that my professional obligation and responsibility is to report any academic misconduct to the Dean of Students Office. Any student found violating the code by cheating, plagiarizing, or misusing any online software will result in disciplinary action. This may include a failing grade of F and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, don't hesitate to get in touch with the Dean of Students Office at dos@njit.edu"

Netiquette

Throughout this course, I expect you to be courteous and respectful to classmates by being polite and active participants. Please respect opinions, even those that differ from yours, and avoid using profanity or offensive language.

Weekly Expectations

Weekly modules are organized in this course. Students must attend the required weekly meeting, complete an assignment, and participate in class challenges and activities.

Course Schedule

Please note that the following general schedule is subject to change if needed. The schedule applies to industry, enterprise, CISCO, and startup teams, with some variations. However, CISCO teams will have additional weekly CISCO academy classes on Tuesdays or Thursdays (based on their enrollment), and RWC coaches will hold FTF & virtual meetings on Saturdays from 11 a.m. to 3 p.m. (as scheduled).

If approved for either CISCO or RWC, the open house will no longer be necessary. The startup teams' midterm and internal final presentations will be announced at a later date and they will also be required to participate in the public showcase.

Week of	Topic	Type of meeting	Format	Assignment
1 (Sept 4)	Capstone Introduction	Regular class (during your class time)	WebEx (Online)	Attendance
2 (Sept 11)	Project Open House **(Saturday, Sept 16. 2023, 12-5 PM)**	The Open House is the only class to attend this week.	**F-T-F On-Campus at the Campus Center Atrium**	Attendance and Project sign-up
3 (Sept 18)	Deliverables training class	Regular class (during your class time)	Face to Face	Attendance and Progress Report 1
4 (Sept 25)	First Sprint deliverables	Coaching/Advising	On Canvas	Submit Scope & Plan **(by Oct 1st)**
5 (Oct 2)	Independent Project Work (In-teams)	Teams meetings	F-T-F or Virtual	Progress Report 2
6 (Oct 9)	Independent Project Work (In-teams)	Teams meetings	F-T-F or Virtual	Progress Report 3
7 (Oct 16)	Second Sprint deliverables	Coaching/Advising	Internal with stakeholders only	First prototype

8 (Oct 23)	Independent Project Work (In-teams)	Teams meetings	F-T-F or Virtual	Progress Report 4
9 (Oct 30)	Independent Project Work (In-teams)	Teams meetings	F-T-F or Virtual	Progress Report 5
10 (Nov 6)	Midterm Presentation (3rd Sprint deliverables)	Video submission	On Canvas	Present & Submit Midterm **(By Nov 9th)**
11 (Nov 13)	Independent Project Work (In-teams)	Teams meetings	F-T-F or Virtual	Progress Report 6
12 (Nov 20)	Independent Project Work (In-teams)	Teams meetings	F-T-F or Virtual	Progress Report 7
13 (Nov 27)	**Final Presentation Showcase (4th Sprint deliverables) Saturday, Dec 2nd**	Very large event with multiple industry judging panels	**F-T-F On-Campus at the Campus Center Atrium**	Present & Submit Final Pres. **(Attendance is equal to a final exam attendance)**
14 (Dec 4)	Final Report Submission	Coaching/Advising	on Canvas	Submit final paper & final progress report (8)
15 (Dec 11)	Sponsor Evaluation Submission	Coaching/Advising	Online	Sponsors submit their final evaluations (*Reminded by PM and operations)*

Additional Information and Resources

Accessibility:

This course is offered through an accessible learning management system. For more information, please refer to Canvas's Accessibility Statement.

Requesting Accommodations:

The Office of Accessibility Resources and Services partners with administrators, faculty, and staff to provide reasonable accommodations and support services for students with disabilities who have provided their office with medical documentation to receive services.

If you need accommodations due to a disability, please get in touch with the Office of Accessibility Resources and Services to discuss your specific needs.

Resources for NJIT Online Students

NJIT is committed to student excellence. To ensure your success in this course and your program, the university offers a range of academic support centers and services. To learn more, please review these Resources for NJIT Online Students, which include information related to technical support.