

Steps for Junior Design Capstone Options

Bachelor of Science in Computational Media & Computer Science

There are four options available to BSCS and BSCM students for the junior design capstone requirement. Once started, a student must complete their junior design capstone option to completion (there are no mixing and matching of options). A grade of “C” or higher is required for the degree.

OPTION 1: PROJECT CLASS

DESCRIPTION: Designed as a team based project class that takes place over two semesters, students will work with either a real customer or your own project idea. These courses will allow you to work in a 5-person team to deliver a minimum viable product (MVP) for an actual organization and are integrated with the technical writing course. The first semester you will develop the product vision and user stories. You will also design the preliminary *User Interfaces* and evaluate those. The report on this evaluation will form the major writing assignment for the semester. In the second semester, you will build out the MVP over five three-week sprints. Documenting your design will form the major writing assignment for the semester. You will also perform project management, retrospectives, and demonstrations during the second semester.

REQUIREMENTS:

1st semester-Junior Design: LMC 3432 (2 hours) + CS 3311 (1 hour) = 3 hours and
2nd semester-Junior Implementation: LMC 3431 (1 hour) + CS 3312 (2 hours) = 3 hours
= 6 hours total

HOW TO SIGN UP:

STEP 1: Register for the same sections of LMC 3432 and CS 3311 (project design courses) by adding both CRNs to your registration page. This course is part 1 of a two-semester Junior Design capstone course that includes a computer science and technical communication component. Teams will develop a software solution to a problem defined either by a client or the team. The semester culminates in the development of a prototype and its demonstration in a formal presentation. Supporting deliverables that teams create include a project vision statement, user stories, and a usability/design support document. The series of deliverables students create will integrate written, oral, visual, electronic and nonverbal (WOVEN) rhetorical skills for various audiences, purposes, and contexts applicable to students’ professional experiences in the workplace.

STEP 2: To continue on the same team, prior to phase 1 registration, your team will need to meet with Dr. Amanda Girard to sign up for a specific section of CS 3312 and LMC 3431 (project implementation courses). Your team will be added to a spreadsheet and given permits to register. Make sure you add both CRNs to your registration page. If you do not have a team from the previous semester, you will need to wait until the permit requirement is lifted to register for an open section and be added to a team. This course is part 2 of a two-semester Junior Design capstone course that includes a computer

science and technical communication component. You will work toward building and delivering your project's main deliverables, and continue revising and refining the project's goals, uses, and results through technical documentation. The course is organized by five, three-week sprints. Three of these sprints are coding intensive, during which teams are expected to accomplish demonstrable progress in coding and implementing their product/system. The semester's major technical document is a *Detailed Design* explaining the architectural and information components of the team's product/system. Students will also be asked to participate in a team *Retrospective* three times during the semester to review processes and to understand areas for improvement in subsequent sprints. Project management is an important component of the course. Teams will be asked to carefully plan, document, and manage their workflow and collaboration to provide a quality project on time at the end of the semester. A final presentation/demo and reflection will round out the deliverables for the course.

OPTION 2: VIP- VERTICALLY INTEGRATED PROJECT

DESCRIPTION: The Vertically Integrated Projects (VIP) Program unites students across campus in undergraduate education and faculty research in a team-based context. Undergraduate VIP students earn academic credits, while faculty and graduate students benefit from the design/discovery efforts of their teams. This program cultivates leadership and mentoring while creating long-term research and development experiences.

REQUIREMENTS: Students completing VIP for their junior design requirement are required to complete **at least three semesters** of VIP on the **same project**, with a **minimum of 5 hours**, and **LMC 3403**. Typically, students sign up VIP 1 (1 hour) + VIP 2 (2 hours) + VIP 3 (2 hours) = 5 hours of VIP credit, and LMC 3403 (3 hours) is taken either during their last semester of VIP or after completion of VIP. VIP 2 and 3 (minimum 4 hours) must be at the 3000/4000 level.

1st semester-VIP 1 (1 or more hours)
2nd semester-VIP 2 (2 or more hours)
3rd semester-VIP 3 (2 or more hours) + LMC 3403 (3 hours)
= 8 hours (minimum)

HOW TO SIGN UP:

STEP 1: Select your major (Computer Science or Computational Media) under "By Majors of Interest" and review teams. Pick a team you are interested in working with for three semesters at <http://www.vip.gatech.edu/teams>.

STEP 2: Apply to join a team at <https://www.vip.gatech.edu/apply-undergraduate-students>. Once you are accepted, you will receive a permit to register for your VIP team project course. The first semester you usually take 1 credit hour.

STEP 3: To register for your second semester of VIP, you may request a permit at <http://www.vip.gatech.edu/request-registration-permit>. It is recommended you request this permit prior to phase 1 registration

Step 4: Register for your third semester of VIP using the same link in step 3. You can choose to take LMC 3403 this semester or any following semester. Details regarding the process for requesting an LMC 3403 permit can be found at the link provided. Once a permit(s) are issued then you will be notified via email: <https://www.lmc.gatech.edu/programs/bs-lmc/registration>

Notes: This option is a total of at least 8 hours. 6 hours will count in your junior design capstone area and 2 hours can count in your free electives.

OPTION 3: RESEARCH OPTION

DESCRIPTION: The Research Option provides students a substantial, in-depth research experience for their capstone requirement. The student is applying and completing the Institute's Research Option through the Undergraduate Research Opportunities Program (UROP). The culmination of the Research Option experience often results in a journal publication or conference presentation, and completion of the program is designated on your transcript. The Research Option (RO) is open to all undergraduate students, but it is tailor-made for future graduate school students and professional-track students who are planning a career in research and development after graduation. CS Students must complete CS research with CS faculty. CM students have the option to complete LMC research hours to fulfill this requirement. Students interested in this must speak with the CM Advisor to discuss how this should properly be planned out.

REQUIREMENTS: Students completing research for their junior design requirement are required to complete the Institute's Research Option which includes 9 hours of Computer Science research, of which 6 must be on the same research project and LMC 4701 (1 hour)- Undergraduate Research Proposal Writing and LMC 4702 (1 hour) Undergraduate Research Thesis Writing. The Research Option will satisfy both their junior design requirement and Technical Writing requirement. Within the nine hours of research at least four hours must be for credit. Five hours could be for pay/audit.

1st semester- Undergraduate Research CS 2699/4699/4980 (3 hours)

2nd semester- Undergraduate Research CS 4980 (3 hours) + LMC 4701 (1 hour)

3rd semester- Undergraduate Research CS 4980 (3 hours) + LMC 4702 (1 hour)

= 11 hours minimum

HOW TO SIGN UP:

STEP 1: Students usually complete one semester of research (CS 2699/4699) with a faculty member before determining if they want to do the Research Option. Research forms can be found at <https://www.cc.gatech.edu/undergraduate-academic-policies-procedures-and-forms> . Once a semester of research is completed, discuss the Research Option with your faculty mentor and review the RO requirements, create a plan with your faculty mentor, and turn in a CS 4980 form from the website above. Research can be taken in varying hours of credit so discuss how many hours you will take each semester with your faculty mentor. Keep in mind that at least 4 hours must be for academic credit and 6 hours must be on the same research project.

STEP 2: Apply for the Research Option at <http://urop.gatech.edu/content/research-option-application>.

STEP 3: Turn in your research form from step 1 following the instructions here:

<https://www.cc.gatech.edu/content/undergraduate-academic-policies-procedures-and-forms> prior to the end of phase II registration. Permits for 4980 are only given after you have applied for the Research Option and have been approved. You will receive a permit prior to the end of phase II registration. CS 2699/4699/4980 are variable hour courses. You will need to change the hours of the course in the drop-down box on the registration page before clicking submit to register for the course. If you did not change the hours on the course, the course will default to one hour. If you need to change the hours, then you can follow the instructions at the link here:

<https://registrar.gatech.edu/registration/grade-modes-and-variable-hours>. **Ultimately you must make sure that you end up with the correct number of hours agreed upon with your faculty mentor.** To request a permit for LMC 4701 you must go to the site and select *Sign up for the Research Option* here: <http://www.undergradresearch.gatech.edu/ro-requirements>

STEP 4: COMPLETE LMC 4701-a one-hour course in undergraduate research proposal writing where a formal proposal for the research project for your thesis is developed. Be sure to identify your faculty "second reader," who will ultimately approve your proposal and thesis.

STEP 5: UPLOAD YOUR APPROVED PROPOSAL. After your project proposal is approved by your faculty mentor and second reader, submit it to the UROP online form.

STEP 6: Turn in the RO form prior to phase 1 registration and request a permit from the UROP website to sign up for LMC 4702 Undergraduate Research Thesis Writing. Prerequisites for the course include completion of LMC 4701 and at least six hours of research.

STEP 7: COMPLETE LMC 4702. In this course, a formal thesis for the research project is developed. For students graduating this same semester, the following items must be completed by the last day of finals. **SUBMIT CERTIFICATION FORM.** Your thesis must be approved by your faculty mentor, second reader, and the undergraduate coordinator for the Research Option school. Approval is designated by signatures on your *Research Option Certification Form*. Completed forms are to be submitted to UROP office in Clough 205.

STEP 8: UPLOAD YOUR THESIS. Upload your final thesis to thesis.gatech.edu for archiving in Georgia Tech Library.

Notes: This option is a total of at least 11 hours. If all 11 hours are for credit then six hours will be used for capstone and five hours will be used for free elective. Audit credit is not applicable towards degree requirements.

OPTION 4: START-UP/ENTREPRENEURIAL OPTION (2 choices)

For students who are particularly interested in startups and entrepreneurialism, there are two paths to choose from when deciding how to complete the Junior Design requirement. Each relies on GT's

CREATE-X program. CREATE-X is a faculty-led, student-focused initiative to instill entrepreneurial confidence in Georgia Tech students. Choose A or B below to fulfil the Junior Design requirement.

REQUIREMENTS (for choice A):

STEP 1: Register for CS 4883-X. Note that you do not need to have a team in mind or project idea before starting the course. Teams are formed during the first couple of weeks. Project ideas result from brainstorming with teammates and mentors during the first third of the semester.

STEP 2: Register for LMC 3403 during the same semester as CS 4883-X or after.

Both CS 4883 and LMC 3403 are 3 hours, so meeting the Junior Design requirement with this choice takes a total of 6 hours.

DESCRIPTION:

CS 4883-X offers an opportunity for CS students to work with a mix of instructors and students from different majors (CS, ME, ECE, BME and more) to develop invention ideas. The course recognizes the value in combining these different tracks in creating products with business value.

The first part of the semester involves student teams exploring problems and the market demand of potential solutions. As problem definitions and respective solutions mature, the teams enter a design and then development phase – culminating in an end-of-semester campus-wide Expo.

Students are not expected to come in with a pre-existing team or problem/solution for the course. Such issues are handled in the first few weeks.

Finally, LMC 3403 addresses the CS degree's Technical Communication requirement. It can be taken during the same semester or after CS 4883-X. Details regarding the process for requesting an LMC 3403 permit can be found at the link provided. Once a permit(s) are issued then you will be notified via email: <https://www.lmc.gatech.edu/programs/bs-lmc/registration>

REQUIREMENTS (for choice B):

Take at least 6 hours of CREATE-X Start-up Lab and Idea 2 Prototype (I2P) and 3 of those 6 hours must be I2P. Students will take these 6 hours with LMC 3403 to satisfy their Technical Communication requirement.

1st semester: Start-up Lab-CS 2701 OR Idea to Prototype (I2P), 3 hours

2nd semester: Idea to Prototype, CS 2699/4699, 3 hours

2nd semester or after: Technical Communication, LMC 3403, 3 hours
= 9 hours

DESCRIPTION: Startup-Lab is a semester-long, hands-on class for undergraduate students at Georgia Tech to learn how to launch a technology startup. We combine in-class lectures with out-of-class learning. You will discover a compelling business model by going out and interviewing people. You will need to commit 6 hours a week of time outside of the class time for this program to be successful. I2P offers undergraduate research course credit and financial support for student teams to advance

their invention ideas for a potential value creating product by performing basic research, analysis, building, and testing--leading to a proof of concept prototype. Students dive deep into a problem for 1-2 semesters with a mentor to receive credit and grade for their capstone requirement. Students will also take LMC 3403 to satisfy their Technical Communication requirement for their degree.

HOW TO SIGN UP (for Startup-Lab):

STEP 1: Apply for Start-Up lab on the [CREATE-X website](#).

STEP 2: If you are accepted, you will receive a permit for CS 2701 (Start-up Lab). *Make sure to register for CS 2701 on your own after receiving the permit.*

HOW TO SIGN UP (for Idea to Prototype-I2P):

STEP 1: You need an idea.

STEP 2: Apply for Idea to Prototype (I2P) on the CREATE-X website. I2P will need information on who you are, what is your idea, how much money do you need, and what do you need to get started.

STEP 3: If you are accepted, you will receive a permit for CS 2699/4699 the I2P section.

STEP 4: You will work with a faculty mentor weekly on your start-up idea and this faculty mentor will monitor your progress. He/she will be responsible for emailing the faculty rep your grade at the end of the semester.

STEP 5: To register for your second semester of CS 2699/4699 I2P you must reapply as in STEP 2 and receive a permit. You may apply with the same project and mentor or different project and mentor.

NOTES: You will also need to take LMC 3403 either the second semester of CREATE-X or a following semester. Details regarding the process for requesting an LMC 3403 permit can be found at the link provided. Once a permit(s) are issued then you will be notified via email:

<https://www.lmc.gatech.edu/programs/bs-lmc/registration>

This option is a total of 9 hours. 6 hours will be used for your capstone requirement and 3 hours can be used in your free electives.