Systems Synthesis Project Course Guide for Students & Faculty

2023-2024 Academic Year

H. John Heinz III College Carnegie Mellon University

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Spring 2024: Acknowledgement of Review

It is the responsibility of all team members to read this handbook to understand the policies and procedures governing Systems Synthesis projects under the Public Policy and Management program at the Heinz College. *Read the handbook carefully.*

After every team member has read the handbook, please complete <u>this Google form</u> by Friday, January 26th.

1. GOALS

The major goal of the Systems Synthesis project course is to provide MSPPM, MAM and MSHCA students with the skills necessary for structuring, managing, and carrying out projects in an organization.

If the school selects important projects, and project teams use rigorous methods and make sound recommendations, Systems Synthesis can make significant and substantial contributions to public policy and non-profit management.

2. PROJECT OVERVIEW

While Systems Synthesis projects may differ considerably in format, there are several requirements common to all projects.

Please note the following dates...

- January 19: We will hold a meeting to review the Educational Project Agreement, Hunt Library resources, and the projects themselves. <u>At least one student from each team MUST attend the meeting in person.</u>
- January 26: Complete the <u>Acknowledgement of Review form</u> for this handbook.
- **February 21**: Upload the signed Consent to Publicly Livestream a Presentation form to AnaBella Lassiter, if applicable.
- End of February/Early March: Mid-term presentation
- April 12: Finalize your final presentation time and date with AnaBella Lassiter.
- April 29 May 3: Final presentation to Advisory Board and Heinz Community.
- **Sunday, May 5**: Student teams must submit their final deliverables and <u>abstracts</u>, and complete peer review of students.

2.1 Structure of Projects

The first half of a semester is devoted primarily to problem definition/structuring. In line with problem structuring, work *must* proceed with initial data collection, analysis, design, or other tasks as it pertains to your project.

A strong project proposal makes problem definition easier and allows the team to start work sooner. *In the first few weeks, communicate with the client to refine the problem statement, scope, and work plan.*

During the second half of a semester, students incorporate client and Advisory Board feedback into their final report. Under a faculty advisor's guidance, they also debrief the project process and experience.

2.1.1 Mid-Term Presentations

A **mid-term presentation is required** to give members of the Advisory Board an update on project progress. It is also *an excellent opportunity* to seek feedback.

Some external clients attend the presentations remotely. Each team should complete the <u>Consent to</u> <u>Publicly Live Stream a Presentation</u>.

2.1.2 Final Presentations

Later in the semester, AnaBella Lassiter will contact your team's project manager to schedule the final presentation. **Do not try to schedule your final presentation by yourself.**

Please send invitations well in advance to your Advisory Board and other attendees as listed in <u>3.2</u> <u>Scheduling Final Presentations</u>. The dress code for final presentations is business casual.

The final project presentation for Spring 2024 will be held between April 29 – May 3.

2.1.3 Final Report

Final report projects include the following components:

- Executive Summary
- Project Objectives
- Basic Analytic Approach
- Data Analysis
- Conclusions
- Recommendations, including suggestions for further research needed to address problems

PDF versions are preferred.

All teams must submit final deliverables to a <u>BOX</u> file. Please request access to the Box file, and AnaBella Lassiter (<u>alassite@andrew.cmu.edu</u>) will grant it. Final deliverables are due May 5th, at midnight.

2.1.4 Abstract

Students must provide a short abstract summarizing the key aspects of the project by May 5th, at midnight, to <u>https://heinz- eforms.heinz.cmu.edu/execsummary/</u>.

A sample abstract is below...

Title: A DSS to Predict Risk for Adverse Reactions Resulting from the Seasonal Influenza Vaccine **Team:** M. Early, S. Li, B. Light, N. Patkar

Client:

Abstract: Nearly 100 million United States residents receive the seasonal flu vaccine each year. According to the CDC, however, over 26,000 of these patients reported an adverse event following their vaccination during the 2015 flu season. There is currently no robust method for screening patients to determine their risk of any adverse event upon receiving the seasonal flu vaccine. Our DSS predicts a patient's risk of suffering a negative reaction to the vaccine by analyzing several health indicators, including the patient's allergies, current medications, and recent illnesses. The DSS notifies the practitioner of the patient's risk and records an explanation of their decision to administer/not administer the vaccine. Recording both the practitioner's decision and the patient's risk helps ensure continuity of care should the patient experience a future negative event. Our DSS system also seeks to characterize the at-risk patient population and identify factors that elevate a patient's risk of experiencing a negative reaction to the vaccine. This information, combined with the system's predictive capabilities, will enhance decision making and improve health outcomes.

2.2 Non-Disclosure Agreements and Student Intellectual Property

Many projects require an Educational Project Agreement (EPA) and possible Non-Disclosure Agreement between students and sponsors. If the project does not have an EPA at the onset, and a client asks about intellectual property rights or a non-disclosure agreement, please inform your Program Director.

2.3 Key Roles

Each group must have the following: a project manager, financial manager, a sub-leader, and an editor. Please see below to learn the responsibilities of each role.

Project Faculty Advisor: The project advisor's role consists of providing guidance, direction, and feedback to the project team. The team must keep the project advisor informed of the team's progress. In addition, the project advisor will deploy a peer evaluation.

Below are the critical student roles:

- **Project Managers:** The project manager helps keep the team on tasks with presentations, final reports, etc.
 - NOTE: Each half of a Systems project requires different management skills. In the first half of the semester, problem structuring requires a student manager who is comfortable with uncertainty and ambiguity. In the second half of the semester, project task management requires a manager who is somewhat compulsive, time-conscious, keeps track of several tasks, and coordinates efforts.
- **Financial Manager:** The role of the Financial Manager is to ensure that the project stays within budget by approving and tracking expenses and limiting spending to ensure no cost overruns.
- **Sub-leaders:** After the students structure the project into groups of work, typically a student will lead each of the sub-teams.
- Editor: Responsible for combing and editing the written material contributed by all students.

2.4 The Project Advisory Board

The student team is responsible for assembling an advisory board for their project. The Advisory Board may have a dozen members or more. It is comprised of the individuals listed below...

- Representatives of the client organization
- Project faculty advisor
- Representatives of the client's and issue's stakeholders
- Faculty
- Other experts in the relevant field

The role of the Advisory Board is to...

- Provide diverse perspectives.
- Assist in determining the scope of the project by considering what is feasible.
- Encourage thinking through a variety of options, factors, and approaches.

Advisory Board members may also point the students toward data and may help students gain access to

otherwise inaccessible data.

3. SCHEDULING MID-TERM & FINAL PRESENTATIONS

When scheduling presentations, student teams should determine the presentation modality (in-person or hybrid) with their clients. All presentations require computing equipment. Please adhere to the following guidelines when you schedule presentations.

- If necessary, you can request a computer from the CMU Instructional Technology office. More information is at <u>http://www.cmu.edu/computing/class-event/</u>.
- If your presentation involves a technical component, include that component in your rehearsal. You can borrow a laptop for rehearsal purposes.

Directions for scheduling mid-term and final presentations are detailed below.

3.1 Scheduling Mid-Term Presentations

- 1. <u>Determine a tentative date (or handful of dates)</u> that work for the team, your system advisor(s), your client, and your program director.
- 2. <u>Check 25Live Pro</u> to ensure that a room with the technical capabilities needed for your presentation is available at the date and time that you selected. Reserve the room.
 - a. If you have technological needs for your presentation, send an email to <u>heinz-</u> <u>computing@andrew.cmu.edu</u> to request assistance for presentation day.
- 3. <u>Communicate the finalized date, time, and location</u> with the client and your advisory board members.
- 4. <u>Create a calendar invite</u> that is discernable to those invited. Include as much detail as you can. For example, "Systems Presentation: Deloitte Systems Mid-Point Presentation" is a clear subject line, whereas "Systems" is ambiguous.
 - a. Let those attending virtually know if the presentation is being recorded.
- 5. <u>Send the calendar invite</u> to the following members of Heinz's administration:
 - a. Dean Krishnan
 - b. Associate Dean Jackie Speedy
 - c. Senior Program Director Alexandra Lutz
 - d. Marketing & Communications Director Shryansh Mehta
 - e. Educational Technology Associate Steven Althardt
 - f. Academic Coordinator AnaBella Lassiter
 - g. If your project involves team members from multiple Heinz programs, be sure to invite all the relevant individuals below.
 - i. MSPPM Projects: Program Director Gladys Sriprasert and Professors Rick Stafford, Jon Caulkins, and Mark Kamlet
 - ii. MSHCA Projects: Professor Denise Rousseau
 - iii. MAM Projects: Program Director Jessica Bowser Acrie, CFA Dean Mary Ellen Poole
 - iv. Joint MISM Projects: Program Director Sean Beggs, Associate Dean Andrew Wasser

3.2 Scheduling Final Presentations

As the final presentation is a highly coordinated event, several Mid-Term Presentation steps are done for you by AnaBella Lassiter, PPM Academic Coordinator (alassite@andrew.cmu.edu).

The modified steps you should take are below.

- 1. <u>Wait for messaging from AnaBella Lassiter</u>. All presentations are either hybrid or in person, and they are held between April 29 and May 3 in pre-booked rooms; AnaBella will present you with available times and days. Select a time and day.
- 2. Once your day and time have been approved, <u>only communicate this finalized date and time</u> <u>with your client</u> and members of your advisory board.
 - a. <u>Create a calendar invite</u> that is discernable. Include as much detail as you can. For example, "Systems Presentation: Deloitte Systems Mid-Point Presentation" is a clear subject line, whereas "Systems" is ambiguous.
 - b. Let those attending virtually know if the presentation is being recorded.
- 3. <u>Send the calendar invite</u> to your client, members of your advisory board, and AnaBella Lassiter.
 - a. Anabella Lassiter will create a central Heinz Community calendar invite that will go out to departments in the Heinz College.

3.3 The Consent to Publicly Live Stream a Presentation Form

To protect the privacy of students and to comply with FERPA, anyone who wishes to publicly livestream a presentation (i.e. critiques, capstone presentations, reviews, qualifying oral exams, performance, thesis and dissertation defenses) for class requirements, and/or record/share that presentation must first complete the <u>Consent to Publicly Livestream a Presentation form</u>.

NOTE: the term public includes guests invited outside of the course participants such as alumni, speakers, reviewers, etc.

Use the guidance to complete the first page...

- 1. The student needs to (a) identify the type of presentation, (b) acknowledge whether the presentation is being recorded, and (c) specify whether they provided CMU with permission for the presentation to be public/shared.
- 2. The student needs to identify the person who will be managing the distribution of the livestreaming connection link (known as the delegate). It is recommended that the team's faculty advisor be the delegate.
- 3. The person who will be contacted to provide access to the presentation, if recorded, needs to be identified by name.
- 4. The student and faculty advisor member needs to sign the form.
- 5. The student must provide a copy of the form to AnaBella Lassiter, who will store and submit it.

The form's additional pages offer detailed information and FAQs.

3.3.1 Video Presentation Guidelines

It is critical to plan for video conferences prior to your presentation day. Build in time for testing the equipment. Follow the steps below to ensure a successful videoconference connection.

- 1. **Create a Zoom link.** Student teams are responsible for creating a presentation Zoom link. *Please review how to prevent <u>Zoombombing</u> before creating your link.*
- 2. For mid-term presentations, select a room. Use 25Live Pro to schedule a room based on your needs and classroom availability. Include a 30-minute setup time if possible. Use the following link to access 25Live Pro instructions: <u>https://www.cmu.edu/es/docs/25live-pro.pdf</u>.
 - a. NOTE: If your group is presenting in-person (or hybrid) for the final presentation, a room will be assigned to you. You only need to reserve a room for the mid-term presentation.
 - b. Rooms that are equipped with Zoom include A301, 2003, 2008, 2009, 2011, 1002, 1004, 1005, 1006, 1007, 1202, 1204, 1206, 1208, and 1214.
- 3. Schedule a test in the presentation room. Run a test in the room one or two days in advance of the presentation. Bring all technology you plan to use for the presentation. Also, reach out to Computing Services at least a week in advance so they can make time to stop by during the test.
- 4. **Get room booked 30 minutes before your presentation**. 30 minutes before your presentation, ensure your laptop is in the room. Heinz Computing staff will set up the equipment and start the connection 15 minutes before the start.

In addition to these steps, please read the following...

- If you want to host a live demonstration (ex. In Excel or a website), the screen must be in Clone, Duplicate, or Mirror mode the entire time and Power point Presentation View must be off.
- Use Windows key + P or \Re + F1 to switch to Clone, Duplicate, or Mirror modes.
- Video content can only be shared if uploaded to Zoom beforehand. Make sure videos are available from your file storage, **not on a website**. Do not risk the chance of poor video quality.
- Clear desktop of any windows not needed for your presentation.
- Visit Heinz College Computing Resource Desk for an adapter, if needed.
- Finish presentation edits ahead of time so that IT can ready your equipment during set up time.

Finally, email the presentation to virtual attendees and print copies for in-person attendees.

3.4 Budget

Each student team has a total budget of \$750 assigned at the beginning of the semester. Each student team has a financial manager who should track expenses and limit spending to avoid project cost overruns. If additional funding is required, speak with your faculty advisor as soon as possible. They must request additional funds from the Dean's office should they deem the funds appropriate.

Project teams will be held strictly to their budgets.

Should a student team wish to make a purchase of any kind in pursuit of advancing their project, the team must first contact AnaBella Lassiter (alassite@andrew.cmu.edu).

Teams cannot make purchases without approval from AnaBella Lassiter. Students will not be reimbursed for purchases made without prior consent.

3.4.1 Approved Purchases

If you have received approval from AnaBella, the following may be purchased with student team funds...

- Necessary travel that is critical to project objectives.
- Client parking for mid-term and final presentations. *Request approval at least five business days in advance.*
- Software
 - Review <u>the CMU website</u> to see if the software is already available. Any additional software requests should be discussed directly with your Program Director.

3.4.2 Unauthorized Purchases

The following items will not be covered with student team funds...

- Any expense that was not approved
- Food for student meetings
- Alcohol
- Professional and consulting services
- Local travel and/or parking use your bus pass!
- Gifts for clients
- Gift cards for any reason!

3.4.3 How to Complete a Purchase

After receiving purchasing approval, purchases can be made with personal money or by contacting AnaBella, who will make the purchase for the student team.

If purchases are made with personal money, request reimbursement by providing AnaBella with...

- 1. The original receipt(s)
- 2. A detailed explanation of the purchase and why it was essential to the project

These documents must be submitted immediately so that processing can take place within 30 days of the purchase(s). *Receipts for expenses more than 30 days old will not be reimbursed by the university.*

4. SYSTEM SYNTHESIS PROJECT ADVISORS

The Project Advisor provides guidance and direction to the project team, assists in resolving team conflicts, provides feedback from peer evaluations and guidance on project deliverables (i.e. presentations to an advisory committee, final report, poster board), and assigns a grade to each student.

4.1 Peer Review of Students and Individual Consultation

The advisor (or advisors) of a Systems Synthesis project assigns individual letter grades to team members at the end of each mini. While grades are the advisor's responsibility, it is important to conduct a peer review in which each team member provides a written evaluation of all other members and themselves.

Reasons for peer review are:

- The results of peer review inform the advisor for grading purposes.
- The results also provide the basis for feedback in individual consultations with students.
- The opportunity to give and receive constructive feedback in a professional manner.

Feedback is essential for the development of individual team members, especially at mid-semester. The recommended format is to have the advisor conduct and summarize the peer review, and then have individual meetings with each team member.

4.2 Student Evaluation of Advisors

Students in Systems evaluate their project advisors just as they do in other Heinz College courses.

5. PROJECT RESOURCES

Review the following for resource information important to completing project-related tasks.

5.1 Computing Services

The Heinz Computing Services department is available for consultation on information technology related subjects. Email <u>heinz-computing@andrew.cmu.edu</u> to schedule an appointment.

5.1.1 Server Use

Project teams may request a single virtual machine for use as a server. Team members can access the server using Microsoft Remote Desktop from their personal computer (on or off campus). To request a virtual server, email <u>heinz-computing@andrew.cmu.edu</u> with the subject line, "System Project Virtual Machine Request."

You may request the following systems:

- Windows Server 2016
- Windows Server 2019
- Windows 10
- Ubuntu Linux (SSH Access only via CLI) Only request if you are familiar with using it.

You should also include the following information:

- Project Name
- Technical Lead (Andrew id)
 - For Linux host, we provide this person with admin access, and they are responsible for granting access to other team members.
- Andrew IDs of all team members needing access
- Hard Drive Capacity: 250GB-500GB (Requests for larger storage capacity reviewed on a case-bycase basis)
- Network
 - NOTE: Heinz Computing places virtual machines on a private network. We can
 provide proxy access to the internet, but internal connections from the Internet are
 not allowed unless you are using the Campus provided VPN. This means non-CMU
 users cannot access the machine. If there is a client who needs direct access to the
 Internet, this will need to be explained in the initial request.

Your team is responsible for installing all software and configuration of any services or platforms required to complete your project. Heinz Computing will provide the base system with all available security patches at the time of request. Once the virtual machine is given to your team, you will be

responsible for all other security patches and configuration. Failure to keep the machine properly secured may result in revocation of network access.

Please properly scope your project requirements **before** requesting a virtual machine. Failure to properly scope/understand your computing requirements may result in delays in your work waiting for machines to be reconfigured with additional capacity or features not originally requested.

Heinz Computing **does NOT back up** project machines. Your team is responsible for ensuring your data is backed up to another location.

A physical computer can be requested if...

- The application needed for the project or activity conducted on the server is incompatible with the virtual computing environment as determined by Heinz Computing Services, e.g., data security requirements.

Computers used for the project will be reformatted 30 days after the end of the semester.

5.1.2 Software

PRE-APPROVAL IS REQUIRED TO PURCHASE (OR DOWNLOAD FREE) SOFTWARE THAT IS NOT LICENSED BY THE UNIVERSITY. This includes any software that your client and advisor recommend that you use. A partial list of approved software can be found on <u>CMU's website</u>. There is no charge for software that is licensed under an unlimited licensing agreement by the University or by Heinz College.

Some software packages do have an additional charge—even if that software has a licensing agreement with the University or with Heinz College. Such charges are assessed to the project budget. If there are questions about charges for project software, please email <u>heinz-computing@andrew.cmu.edu</u>.

Pre-approval of software purchase can be acquired by emailing AnaBella Lassiter and requesting use of software. Please include the following details in your email:

- Software Name
- Direct link to software
- Direct link to terms and conditions
- 1-2 sentence statement explaining why and how you will be using the software

5.2 Survey Design Assistance

The **Carnegie Mellon University Office of Institutional Research and Analysis** is a great resource for students who need guidance designing/analyzing surveys or crafting evaluation and research tools.

Visit <u>CMU's website</u> for more information about this resource. To schedule a meeting, reach out to Mark Chimel (<u>mchimel@andrew.cmu.edu</u>) or Erin Searle (<u>esearle@andrew.cmu.edu</u>).

5.3 How to Request Student Email Addresses for Surveys and Research Papers

If students need to access CMU student email addresses for research purpose (including but not limited to surveys and class projects), contact the Office of Institutional Research *at least two weeks prior* to when the information will be used. Follow the steps outlined <u>online</u>.

5.4 Obtaining Institutional Review Board (IRB) Approval

Many teams inquire about submitting a project that includes surveys, focus groups, etc. to the Institutional Review Board (IRB). Please see <u>the Course-Related Student Project checklist</u> to know if this is the case. Typically, surveys, focus groups, etc. for Systems projects <u>do not</u> require IRB review given that results are not meant to be claimed as generalizable outside of the specific project/client.

5.5 Assessment of Student Learning for Accreditation

Programs may conduct a series of assessments to gather data as part of the Middle States accreditation to gather evidence of student learning. The Program Director will work with your faculty advisor to coordinator the assessments.

6. SYSTEMS SYNTHESIS OVERSIGHT COMMITTEE (SSOC)

The Systems Synthesis Oversight Committee (SSOC) provides an organizational setting for Systems Synthesis work and a brokerage service for students, clients, and faculty that ensures all undertaken projects advance the interests of all involved groups in a mutually beneficial way.

6.1 SSOC Membership and Responsibilities

The SSOC includes faculty, MSPPM, MAM, and MSHCA Program Directors, MSPPM and MAM Program Chairs, and the Associate Dean. Their responsibilities include...

- Identification of policy areas and organizations to target for projects
- Maintenance of a portfolio of projects in balance with student and faculty areas of interest
- Review and provision of feedback to advisors and students submitting proposals
- Review of current projects to ensure comparable standards in evaluating projects
- Student grades

6.2 Making Systems Synthesis Projects "Add Up"

Individual Systems Synthesis projects have timeframes of a single semester. Nevertheless, projects in general should contribute to a larger effort or purpose. The purpose of the Systems Synthesis is to serve the mission of Heinz College—particularly regarding education, community ties, and public service.

Typically, public policy issues are solved through a series of debates prior to political or administrative action taken to anticipate and ameliorate problems. It may take a large effort to gain the knowledge, analytical results, and credibility to participate in a policy debate, so it is easy to imagine some projects are structured as series on a given policy platform.

The same may be true for management-oriented projects. It takes time to build a working relationship with an organization, understand the major players, and win their trust. With the success of one project comes no shortage of additional projects, all of which add up to a significant improvement overall.

In such cases, each project must have its own beginning and ending, with identifiable independent outputs.

LEVEL OF	EXCELLENT (4)	PROFICIENT (3)	DEVELOPING (2)	RUDIMENTARY (1)
PROFICIENCY				
Problem Scoping	Clearly defines the problem, its boundaries, and the project's scope. Identifies appropriate data for analysis and optimal methodology to address problem.	Defines the problem, with some understanding of its boundaries, and the project's scope. Identifies appropriate data for analysis.	Sometimes makes contributions to defining the project's scope, but ideas are vague. Attempts to identify data for analysis but may not understand optimal methodology to solve problem.	Does not make contributions to define the project's scope. Does not identify appropriate data for analysis.
Problem	Identifies multiple approaches	Identifies multiple approaches	Identifies only a single	Identifies one or more
Solving	for solving the problem that apply within a specific context.	for solving the problem, only some of which apply within a specific context	approach for solving the problem that applies within a specific context.	approaches to solving the problem that do not apply within a specific context.
Project Management	Consistently executes tasks thoroughly, accurately, and in a timely fashion. Consistently coordinates tasks among group members.	Often executes tasks that are satisfactorily completed and on time. Often keeps members informed of their work.	Partially completes tasks and misses some deadlines. Limited communication on their progress to other constituencies.	Carelessly carries out tasks and frequently misses deadlines.
Teamwork	Supports a constructive team climate by doing all the following:	Supports a constructive team climate by doing any three of the following:	Supports a constructive team climate by doing one or two of the following:	Supports a constructive team climate by doing none of the following:
	 Treats team members respectfully by being polite and constructive in communication. Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. Assists and/or encourages team member 	 Treats team members respectfully by being polite and constructive in communication. Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. Assists and/or encourages team member 	 Treats team members respectfully by being polite and constructive in communication. Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. Assists and/or encourages team member 	 Treats team members respectfully by being polite and constructive in communication. Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. Assists and/or encourages team member
Conflict Resolution	Resolves interpersonal problems without project interruption.	Resolves interpersonal problems with limited project interruption.	Frequently loses focus from the project due to interpersonal conflict.	Allows personal conflict to significantly disrupt the progress of the project.

-Excerpted from Association of American Colleges and Universities Problem Solving (*) and Teamwork (**) Value Rubric