Systems Synthesis Capstone Project – 90-739 / 95-720
Carnegie Mellon University – Heinz College of Information Systems & Public Policy

Faculty Advisor:

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Office Hours: 30 minutes following each meeting (in person or teleconference)

Course Administrator:

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MPM – Gladys Sriprasert, HBH 1115D, 412 268 1909, gladysp@andrew.cmu.edu

Course Prerequisites:

Students should have taken courses that cover both information technology (Core IT Design/Development/Management/Analytics, etc.) and business/managerial topics (Financial management, professional speaking/writing, etc.) and be in their final semester of their degree.
Optional but strongly encouraged prerequisites include a background in project management or IT project management, estimation, organizational management and strategizing.

Course Description:

The capstone project course provides students an exciting opportunity to apply skills they develop in the classroom to a problem from a real-world context. In doing so students begin to make the transition from their academic world to the environments in which they will work once they graduate. In these environments the challenges of team building resource development client relations limited information and pressing deadlines are as real and important as the technical and managerial components of any task. The project is a semester long intensive team-based experience focusing on one of the specialization areas available in the MISM/MPM programs. A typical project course includes design and development of an information system for an external client - often a corporation or public agency. Each project results in a final report/document as well as a demonstration of a prototype for a significant portion of a larger system or a finished system.

Learning objectives:

Solve a real-world problem for a real-world client while collaborating with top industry and government partners.

Move beyond the classroom and gain tangible skills through work opportunities both on- and off-campus with guidance from faculty experts.

Become an effective leader by delivering on your ideas in a measurable way, learn how to clearly communicate with all stakeholders, and understand how your roles and decisions fit into the broader landscape of the field.

Reading Materials and Software:

Project-specific readings and forms are available on Canvas or will be distributed in the first meeting. There is no textbook requirement. Other important documents such as program and capstone handbooks can be referenced here:
https://www.heinz.cmu.edu/current-students/

Software includes:
Communication and tracking software: Slack, MS Teams, Zoom, Canvas), etc.
Project specific tracking software: Anything utilizing a Gannt Chart, Burndown Chart, Work Breakdown Structure (WBS), etc.
File repository: Github, Box, Google Drive, Dropbox, Canvas, etc.

Feel free to utilize your favorite coding and development tools for both your prototypes and documentation/presentations. <u>Make sure that everyone on the team as well as the client/sponsor and advisor have the ability to access and review.</u>

Attendance Policy:

Students are expected to attend all scheduled mandatory meetings with the advisor and client/sponsor, as well as all presentations, poster sessions, and final requirements. As most of the capstone involves team-based work including live presentations, it is imperative that students are a part of each active session.

Cheating, Plagiarism, and Academic Integrity:

Students at CMU are engaged in preparation for professional activity of the highest standards. Each profession constrains its members with both ethical responsibilities and disciplinary limits. To assure the validity of the learning experience Carnegie Mellon establishes clear standards for student work. You are required to be familiar with all university policies on this subject (see http://www.cmu.edu/policies/documents/Cheating.html). An extract of these policies is reproduced here:

In any presentation, creative, artistic, or research, it is the ethical responsibility of each student to identify the conceptual sources of the work submitted. Failure to do so is dishonest and is the basis for a charge of cheating or plagiarism, which is subject to disciplinary action.

Cheating includes but is not necessarily limited to:

- o Plagiarism, explained below.
- o Submission of work that is not the student's own for papers, assignments or exams.
- o Submission or use of falsified data.
- o Theft of or unauthorized access to an exam or quiz.
- o Use of an alternate, stand-in or proxy during an examination.
- o Use of unauthorized material including textbooks, notes or computer programs in the preparation of an assignment or during an examination.
- o Supplying or communicating in any way unauthorized information to another student for the preparation of an assignment or during an examination.
- o Collaboration in the preparation of an assignment. Unless specifically permitted or required by the instructor, collaboration will usually be viewed by the university as cheating. Each student, therefore, is responsible for understanding the policies of the department offering any course as they refer to the amount of help and collaboration permitted in preparation of assignments.
- o Submission of the same work for credit in two courses without obtaining the permission of the instructors beforehand.

Plagiarism includes, but is not limited to, failure to indicate the source with quotation marks or footnotes where appropriate if any of the following are reproduced in the work submitted by a student:

- o A phrase, written or musical.
- o A graphic element.
- o A proof.
- o Specific language.
- o An idea derived from the work, published or unpublished, of another person.

Regarding plagiarism, you should also familiarize yourself with the content of the separate handout entitled "A Note on Plagiarism and Citing Sources."

One application of this plagiarism policy for this project is that you may <u>not</u> provide or receive information on projects or discussions from students outside of your team. This includes both students from prior semesters and students from other projects in this semester. <u>The rule of thumb is that the work provided is original work from the individual and team</u>.

Use of Generative AI (ChatGPT)

I expect you will use AI (e.g., ChatGPT and image generation tools) in this class. In fact, some assignments require it. Learning to use AI is an emerging skill and to get started, I have provided three tutorials below:

- How to use ChatGPT to boost your writing
- The practical guide to using AI to do stuff
- APA citation guidelines for GAI (ChatGPT example)

You should also be aware of the limits of ChatGPT:

- **If you provide minimum-effort prompts, you will get low-quality results.** You will need to refine your prompts in order to get good outcomes. This will take work.

- **Don't trust everything it says.** If it gives you a number or fact, assume it's wrong unless you either know the answer or can check with another source. You will be responsible for any errors or omissions provided by the tool. It works best for topics you understand.

- **AI is a tool, but one that you need to acknowledge using**. Please include a paragraph at the end of any assignment that uses AI explaining what you used the AI for and what prompts you used to get the results. Failure to do so can constitute as an academic integrity violation.

- **Be thoughtful about when this tool is useful.** Don't use it if it isn't appropriate for the case or circumstance.

Resources we may use to validate work against generative AI (and that you can use) include:

https://aiwritingcheck.org/
https://www.turnitin.com/ (built into Canvas)
https://github.com/jwkirchenbauer/lm-watermarking
https://gptzero.me/

Some CMU strategies being employed include:
https://www.cmu.edu/teaching/technology/aitools/index.html

You may use generative AI for the following work:
- Group & individual assignments

You may NOT use generative AI for the following work:
- Surveys & the final exam

I am happy to meet and help you with these tools during office hours or after class.

Course Web Site: Web: http://canvas.cmu.edu

We may use the Canvas site for capstone information and announcements. If you are registered in the capstone class, you should already have access. Your login id is your andrew id and password. If this does not work, please e-mail me to obtain temporary access.

Canvas has an up-to-date copy of the syllabus, schedule, pertinent documentation, A/V, and any capstone announcements. While I will try to make announcements both in meetings and on Canvas, it is a good idea for you to check Canvas regularly.

Additionally, Canvas has links to class readings and relevant sites mentioned in class and more extensive background material.

Grading and Course Requirements:

The final grade for the course is distributed among various components of both team & individual contributions:

		Grade
Individual Professionalism (1/6) (based on peer & client/sponsor evaluations, observations, attendance, etc.)	**Team Professionalism (1/6)** (based on client/sponsor evaluations, team responsibilities to advisor & client such as meeting attendance, responsiveness, & organization of project work)	**= 1/3**
Individual Technical (2/6) (based on peer & client/sponsor evaluations, research, scoping, technical knowledge & contributions of your work to the team effort)	**Team Technical (2/6)** (based on client/sponsor evaluations, the teams' abilities to research, scope, & implement technologies to solve the client problem, as well as documenting & presenting their findings)	**= 2/3**
	Total Grade:	**1**

Total grade equates to the max you can earn for the project (TG*100) which will equate to the final letter grade based on a 100-point scale. Grading Scale is as follows:

GPA	Letter Grade	Percentage Grade		GPA	Letter Grade	Percentage Grade
4.33	A+	98-100+		2.67	B-	80-83.9
4.00	A	94-97.9		2.33	C+	77-79.9
3.67	A-	90-93.9		2.00	C	74-76.9
3.33	B+	87-89.9		1.67	C-	70-73.9
3.00	B	84-86.9		0	R	0-69.9

An example breakdown is as follows:

Student Name	Individual Tech	Individual Prof.	Team Tech	Team Prof.	Total	Letter Grade
Jean Doe	95	95	89	90	92.1	A-
Jeff Dee	90	83	89	90	88.5	B+
Jake Dell	80	100	89	90	88	B+
Jill Dean	100	100	89	90	94.5	A

Other areas that will be considered for grading can include assessments, attendance to other project presentations, & other requirements set forth in the project. These are outlined in the following section

A Note on Regrade Requests:

If you believe that your grade is inaccurate, you may request a regrade under the following conditions:

1. Regrade requests must be submitted in writing within 3 days of the date when the grade was given.

2. Regrade requests must outline the reasons you deserve a change in your grade. Referencing another student's grade is inappropriate and irrelevant. While I do my best to apply an even standard across students, I can't discuss anyone else's grade with you, so I need to deal with the merits of your individual case.

3. I reserve the right to regrade the entire capstone and thus your grade may go up, down, or stay the same. This regrade is considered final.

4. Capstone participation grades are inherently subjective and not subject to a regrade request. I will make notes on participation at the end of each meeting and assign grades at the end of the semester based on these notes.

Rubrics for Grading Each Section:

Each grade section is made up of one or more evaluation instruments to determine the final grade. The following outlines these criteria for determining that sections grade component.

Team Technical Grading Rubric (2/6):

Technical Analysis (60%) - understanding of the project & the issues highlighted, & solid reasoning/development for your argument/recommendation/prototype based on the problem or opportunity presented.

LEVEL OF PROFICIENCY	Exemplary (9-10)	Accomplished (7-8)	Developing (4-6)	Needs work (1-3)
Problem Scoping	Clearly defines the problem, its boundaries & the project's scope through hypothesis analysis & testing.	Defines the problem, with an understanding of its boundaries & the project's scope through hypothesis analysis & testing.	Sometimes makes contributions to defining the project's scope, but ideas through the hypothesis analysis & testing are vague.	Doesn't make contributions to defi project's scope throu hypothesis analysis & testing.
Problem Solving	Reviews multiple approaches for solving the problem that identifies a grounded	Identifies multiple approaches for solving the problem, only some of which	Identifies only a single approach without other considerations for solving	Identifies one or mo approaches to solvin problem but that do

	approach within the specific context utilizing the Lean Launchpad methodology.	apply within a specific context utilizing the Lean Launchpad methodology.	the problem but that applies within the specific context & may or may not utilize the Lean Launchpad methodology effectively.	apply within the spec context or that utilize Lean Launchpad methodology.
Technology & Managerial Implementation (strength, testing, evaluation, quality)	Clear knowledge & know-how to research & implement appropriate Lean LaunchPad methodologies & technologies for the project. This could include areas out of scope that add value & were approved.

Business & technological decisions are synergistic & displayed thoroughly through development of MVPs & scoped through the VPC & MMC process.

Prototype/demo/component presents & is delivered effectively. | Some knowledge & understanding of the methodology & technology to incorporate within the project are displayed. Methods & technical needs are mostly met to provide adequate project delivery & a solution to problem area(s) identified by the client.

Managerial &/or technical decisions made for the MVPs & through the VPCs & MMCs may show some minor lack of cohesiveness.

Prototype/demo/component presents & is delivered but with minor issues. | Vague incorporations or directions of technical research & implementations. Technical needs are still in development but show signs of creating a solution to the client problem but may not be met within the project.

Managerial &/or technical decisions made for the MVPs & through the VPCs & MMCs may show major lack of cohesiveness.

Prototype/demo/component presents & is delivered but shows many issues. | No knowledge or understanding of the technology to be incorporated within project, technical ne are not met, or do n work.

No cohesiveness bet business & technical constraints through managerial &/or tech decisions made for t MVPs & through the & MMCs.

Prototype/demo/com ent is not delivered does not function as should. |
| **Generates valid conclusions/decisions & considers the audience** | Recommended solution is based on stated criteria, analysis & constraints & considers other options. Project expectations are fully met or exceeded for all beneficiaries. Considers not only the current but future scope. | Solution/decision is reasonable; further analysis of some of the alternatives or constraints defer different recommendations. Project expectations are mostly met. Beneficiaries are mostly considered in the final outcomes. | Solution/decision is reasonable; further analysis of some of the alternatives or constraints may have led to different recommendations. Project expectations are somewhat met. Beneficiaries are somewhat considered in the final outcomes. | Only one solution is considered, or other solutions were ignor incompletely analyze Many constraints & criteria were ignored Project analysis show poor project outcom Beneficiaries are rare not considered for th final outcomes. |

Technical Content (40%) - based on the use of readings, resources, & supporting examples.

LEVEL OF PROFICIENCY	Exemplary (9-10)	Accomplished (7-8)	Developing (4-6)	Needs work (1-3)
Identifies relevant & valid sources of information to support decision-making through your research	All relevant information is obtained, & information sources are valid & accurate.

Solutions are well supported by a deep & logical connection between research & conceptualizations.

Alternatives exploring different facets of use are considered & are appropriately analyzed for | Sufficient information is obtained, & most sources are valid.

Solutions are mostly supported by the information gathered that create a connection between research & concept.

Alternatives are considered but are not fully vetted.

Identifies appropriate data | Some relevant information is obtained but information sources are not always valid & accurate.

Solutions are not well supported by the information gathered & doesn't show a connection between research & concept.

Alternatives exploring different facets of use are rarely considered or are not appropriately analyzed for feasibility | Insufficient information is obtained &/or sources lack validity & reliability.

Solutions have no support b evidence & nothing to show the information gathered cr a connection between the research & concept.

Alternatives are not conside or are not valid.

Does not identify appropria data for analysis. |

| | feasibility.

Identifies appropriate data for analysis & exceeds findings in an optimal methodology to address the problem.

Sketches, prototypes, graphs &/or scenarios are used to bring opportunity areas to life. | for analysis & a methodology for addressing the problem.

Sketches, prototypes, graphs &/or scenarios are sometimes used or may be slightly inconsistent. | Attempts to identify data for analysis but may not understand or have an optimal methodology to solve the problem.

Sketches, prototypes, graphs &/or scenarios are used but need a lot of explanation to bring opportunity areas to life or struggle to make a connection. | Sketches, prototypes, graph &/or scenarios are not used do not bring opportunity ar life or only cause confusion |

This rubric is combined with the client/sponsor feedback to determine the final grade (R+C/2).

The following three criteria will be examined:

1. Technical outcomes/productions from the team. Were all requests during the first mini-semester met with technical expertise?

2. Fulfillment of project goals by the sponsor. Did the team meet all objectives set forth by the sponsor?

3. Confidence in the output & submission of the project. Is the sponsor happy with the final product/prototype/presentation/etc.?

Team Professionalism Grading Rubric (1/6):

Since the project relies on group work, we will use a client review instrument to ensure that feedback from the client about the teams' progress contributions are considered in the determination of the final grade. This is in tandem with the following rubric that will be used to assess the team's professionalism in the project.

Professional Skills (100%) - Clear structure & organization of the deliverables, following the format requirements, & staying within the page/time limit as well as adhering to all professional standards during the project.

LEVEL OF PROFICIENCY	Exemplary (9-10)	Accomplished (7-8)	Developing (4-6)	Needs work (1-3)
Client Skills	Meeting interactions are professional & productive, eliminates jargon & explains ideas well. All beneficiary meetings are met in a timely fashion & are well organized in advance. Demonstrates a high level	Meeting interactions are mostly professional & productive. Few miscommunications & disconnects with some jargon that may interfere with explanation of ideas. Most beneficiary meetings are met in a timely fashion & are mostly organized in	Meeting interactions are somewhat professional & productive. More miscommunications & disconnects with some jargon that may interfere with explanation of ideas. Most beneficiary meetings are needing improvement to time considerations &	Meeting interactions are unprofessional &/or unproducti Multiple miscommunications & disconnects, & full for jargon & misunderstandings of ideas. Most beneficiary meetings are r meeting time considerations & showing a lack of organization i advance.

	of comfort & connection with the audience. Speakers respond accurately & appropriately to audience questions & comments.	advance. Demonstrates a decent level of comfort with the audience. Speakers respond to most questions accurately & appropriately but may be slower to respond.	are only somewhat organized in advance. Demonstrates a slight discomfort with the audience. Speakers respond to questions less accurately & appropriately, &/or respond slowly.	High degree of discomfort interacting with the audience. Speakers have difficulty respond clearly & accurately to audience questions or never responds.
Presentation Skills (visual, oral, written documentation) for telling the story	Slides are error-free & logically present the main components of the process & recommendations. Material is completely legible, & the graphics highlight & support all of the main ideas. Sentences are grammatical with no spelling errors present. Speakers are audible & fluent on their topic, & do not rely on notes to present or respond. Is an effective summary of the team's efforts & works visually & considers all audiences. Does not run over allotted time but stays within the ideal range (Within 1-2 minutes) or allotted page length & stays concise. Report is well organized & clearly written. The underlying logic is clearly articulated & easy to follow. Diagrams or analyses enhance & clarify presentation of ideas. Sentences are grammatical & free from spelling errors. Demoing of final products is successful & includes a backup plan.	Slides are mostly error-free & logically present the main components of the process & recommendations. Material is completely readable with some slight effort, & graphics reiterate most the main ideas. Sentences are grammatical with minimal spelling errors present that do not hinder the reader. Speakers are mostly audible & fluent on their topic & require minimal referral to notes. Is an effective summary of the team's efforts & is visually appealing & understandable for the audience. May slightly run over time or ends prematurely (2-4 minutes) or is over/under page length. Report is organized & clearly written. In all areas the logic or flow of ideas is clear to follow. Diagrams are consistent with the text. Demoing of final products is mostly successful & may or may not include a backup plan.	Slides are not completely error-free &/or logically presenting the main components of the process & recommendations. Material is readable with some challenges, & graphics somewhat reiterate the main ideas. Sentences are seeing grammatical errors with more spelling errors present that start to hinder the reader. Speakers are somewhat audible & fluent on their topic & require continual referral to notes or read directly from slides. Is a slightly less effective summary of the team's efforts & is less visually appealing & understandable for the audience. May run over time (over 2 minutes) or ends prematurely (4-5 minutes), or grossly over or under page length. Report is organized & clearly written for the most part. In some areas the logic or flow of ideas is difficult to follow. Diagrams are somewhat consistent with the text. Demoing of final products is somewhat successful, includes a backup plan that needs improvements.	Slides contain errors & lack a logical progression. Major aspect of the analysis or recommendations are absent. Diagrams or graphics are absent confuse the audience. Sentences are seeing many grammatical errors with many spelling errors present that completely hinder the reader. Speakers are often inaudible or hesitant, often speaking in incomplete sentences. Speaker rely heavily on notes. Is not an effective summary & do not work visually. The full audience is not consider Time is well under or over allott time (5+ minutes) or is extreme over or under page length. Report lacks an overall organization. Reader has to ma considerable effort to understar the underlying logic & flow of ideas. Diagrams are absent or inconsistent with the text. Demoing of final products is not successful, &/or does includes a backup plan that works as an alternative.

This rubric is combined with the client/sponsor feedback to determine the final grade (R+C/2). The following three criteria will be examined:

1. Team responsiveness to communications; email, meetings, phone calls, etc. Did the team respond to all inquiries & in a timely manner?

2. Team professionalism. Did the team approach all work with the sponsor in a professional manner?

3. Confidence in the output & submission of the project. Is the sponsor happy with the final product/prototype/presentation/etc.?

Individual Technical Rubric (2/6):

Since the project relies on group work, we use a peer review instrument to ensure that feedback from group members about team member technical contributions are considered in determination of the final grade. This is in tandem with the faculty advisor's observations of student's technical contributions to the team & project, as well as knowledge of Lean Launchpad methodology through learning materials & assignments.

Individual Professionalism Rubric (1/6):

Since projects rely on group work, we use a peer review instrument to ensure that feedback from group members about team member professionalism are considered in determination of final grades. This is in tandem with the faculty advisor's observations of student's professional contributions to the team & project.

A Note on Regrade Requests:

If you believe that your grade is inaccurate, you may request a regrade under the following conditions:

1. Regrade requests must be submitted in writing <u>within 3 days</u> of the date when the grade was given.

2. Regrade requests must outline reasons you deserve a change in your grade. Referencing another student's grade is inappropriate & irrelevant. While we do our best to apply an even standard across students, we can't discuss anyone else's grade with you, so we need to deal with the merits of your individual case only.

3. We reserve the right to regrade the entire assignment requested for review & thus your grade may go up, down, or stay the same. This regrade is considered final.

Project participation grades are inherently subjective & not subject to regrade requests. We will make notes on participation at the end of each meeting & assign end of semester grades based on these notes.

Late Submission Policy:

All late deliverables are subject to a grade penalty of 10% per day past the due date/time, with a maximum of 4 days. Anything submitted beyond 4 days past the due date will receive and automatic 0. Teams and individual submissions are subject to the same policy. Any issue with meeting a deadline must be cleared through the advisor or client/sponsor prior to the submission date/time or will be subject to the penalty.

Diversity & Inclusion:

It is our intent that students from all diverse backgrounds & perspectives be well served by this course, that students' learning needs be addressed both in & out of this course, & that the diversity that students bring to this course be viewed as a resource, strength & benefit. It is our intent to present materials & knowledge that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, & culture. Your suggestions are encouraged & appreciated. Please let us know ways to improve the effectiveness & experience for you personally, or for other students on the team. In addition, if any of our meetings conflict with your religious events, please let us know so we can make arrangements for you.

The topics & areas that we cover can vary, some of which can be difficult, not just intellectually but emotionally. While we expect there to be rigorous discussion & even disagreement during our meetings, we ask that you engage in discussion with care & empathy for the other members on the team as well as the beneficiaries & sponsors we work with. Aim to disagree without becoming disagreeable. In this course we will not shy away from the uncomfortable. Critically examining & assessing our most basic assumptions & values is not just one of the tasks of philosophy but is an activity vital to living an authentic life. We urge you to have the courage to the uncomfortable in this course. In exchange for your courage, we will work to ensure an environment that supports your taking these intellectual & emotional risks.

Student Health & Wellness:

CMU & all classes, including this one, strive to accommodate students in all capacities by creating a learning environment that considers health & well-being of all students. A review the university policies regarding health & wellness can be reviewed at: https://www.cmu.edu/graduate/current-grad-students/health-&-wellness/index.html

Graduate student policies can be reviewed at: https://www.cmu.edu/graduate/policies/index.html

Students who need to miss class should email their professors and/or TA's. If personal accommodations are needed, students should reach out to the Office of Disability Resources.

Covid-19 Policies:

Facial Coverings: Facial coverings both indoors and outdoors are optional.
Vaccinations: All students, faculty & staff are no longer required to be up to date on vaccinations.

As of May 12 2023, CMU has decommissioned Tartan Testing operations and the lab. Testing is no longer required. COVID-19 tests will be available in the vending machine located in the Cohon University Center until supplies are depleted.
CMU no longer requires reporting COVID-19 cases. Community members who contract COVID-19 should follow the guidance of their care provider regarding isolation, as they would with any communicable disease.

Accommodations for Students with Disabilities:

If you have a disability & have an accommodations letter from the Disability Resources office, I encourage you to discuss your accommodations & needs with me as early in the semester as possible. I will work with you to ensure that accommodations are provided as appropriate. If you suspect that you may have a disability & would benefit from accommodations but are not yet registered with the Office of Disability Resources, I encourage you to contact them at access@andrew.cmu.edu.

Student Academic Success Center (SASC):

SASC focuses on creating spaces for students to engage in their coursework & approach learning through a variety of group & individual tutoring options. They offer many opportunities for students to deepen their understanding of who they are as learners, communicators, & scholars. Their workshops are free to the CMU community & meet the needs of all disciplines & levels of study. SASC programs to support student learning include the following (program titles link to webpages):

- **Academic Coaching**--This program provides holistic, one-on-one peer support & group workshops to help undergraduate & graduate students implement habits for success. Academic Coaching assists students with time management, productive learning & study habits, organization, stress management, & other skills. Request an initial consultation here.
- **Peer Tutoring**--Peer Tutoring is offered in two formats for students seeking support related to their coursework. Drop-In tutoring targets our highest demand courses through regularly scheduled open tutoring sessions during the fall & spring semesters. Tutoring by appointment consists of ongoing individualized & small group sessions. You can utilize tutoring to discuss course related content, clarify & ask questions, & work through practice problems. Visit the webpage to see courses currently being supported by Peer Tutoring.
- **Communication Support**--Communication Support offers free one-on-one communication consulting as well as group workshops to support strong written, oral, & visual communication in texts including IMRaD & thesis-driven essays, data-driven reports, oral presentations, posters & visual design, advanced research, application materials, grant proposals, business & public policy documents, data visualization, & team projects. Appointments are available to undergraduate & graduate students from any discipline at CMU. Schedule an appointment on their website (in-person, zoom synchronous, or recorded video), attend a workshop, or consult handouts or videos to strengthen communication

skills.

- **Language & Cross-Cultural Support**--This program supports students seeking help with language & cross-cultural skills for academic & professional success through individual & group sessions. Students can get assistance with writing academic emails, learning expectations & strategies for clear academic writing, pronunciation, grammar, fluency, & more. Make an appointment with a Language Development Specialist to get individualized coaching.
- **Supplemental Instruction (SI)**--This program offers a non-remedial approach to learning in historically difficult courses at CMU. It utilizes a peer-led collaborative group study approach to help students succeed & is facilitated by an SI leader, a CMU student who has successfully completed the course. SI offers a way to connect with other students studying the same course, a guaranteed weekly study time that reinforces learning & retention of information, as well as a place to learn & integrate study tools & exam techniques specific to a course. Visit the website to see courses with SI available here.