
GT1201: Exploring Grand Challenges

Instructor: Dr. Jeff Davis, School of ECE, Faculty Co-Director Grand Challenges LLC

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Class Time: Tues/Thur 9:35-10:55
Class Loc.: Brittain Rec

Office Hours in Howell: Tuesday/Thursday 1:00-3:30

Course Description

By the end of this semester, the goal is for your team to pitch a feasible, well-crafted, and compelling project proposal for a Grand Challenges project. You already have a team, and you already have a general area of focus. Over the course of this semester, we will help your team refine and focus your project statement and develop a proposed solution to these problem. In particular, we want you to:

- **Motivate the problem!** *Is it a problem that matters? To what extent do you understand it?*
- **Understand the reality of the problem!** *Who are the stakeholders? Many great ideas fail because of the needs and wishes of relevant stakeholders were not consider.*
- **Understand the constraints!** *Why is solving the problem hard? What constrains possible solutions? Why have past solutions failed?*
- **Accurately describe and assess your problem quantitatively.** *Using technical, scientific, economic, demographic, and social science data sources.*
- **Propose a FEASIBLE solution!** What can YOU do with the resources that you have access to? A huge part of the process is scaling the proposed solution to one that is feasible. Not just physical resources, but human resources and know-how. **Be bold, but be realistic!** You need to also consider your own availability of time and energy.
- **Consider all the necessary details in your proposal** – Who will do what? What resources do you need? What are the measurable objectives and an anticipated timeline?

We will use concepts and methods already developed last semester. In addition, you will continue to use your team and organizational skills taught last semester to:

- Understand and analyze the dynamics of your role on the team and the team itself.
- Gain experience in leadership situations, recognizing that “leadership” happens up and down the organizational ladder.
- Apply problem-solving skills to difficult team dynamics.

Course Deliverables and Grading

A theme throughout this course is learning through **failure and iteration**. Ideas will be proposed, dug into, more facts and brainstorming obtained, and eventually refined. We reward the finished product, not the interim steps. We expect initial ideas not to work out, and will not penalize you for doing so. Grading is largely based on documenting team and individual effort, fact finding, and final presentations. The draft proposal, while a major part of the course, does not receive a formal grade, but the feedback is invaluable in crafting the final proposal. Tentative due dates are in the table below, actual due dates will be posted on t-square for the class in case they change.

Description	Weight	Due Date
Six Solutions Report	9%	Jan 26
Field Trip/Observations	9%	Feb 2
Expert Interviews	9%	Feb 11
Test a Problem Assumption	9%	Feb 18
Presentation to Class on Refined Problem Statement	6%	Feb 18/23
Your Evaluation of 2 Group Presentations	4%	Feb 25
5-Slide Solution Pitch (in class presentation)	6%	March 29/31
Your Evaluation of 2 Group Presentations	4%	April 5
Draft Proposal	0%	March 30 (Wed) by 11:59 PM (online t-square)
Interview Week (Shark Week)	0%	April 5 /7
Banquet Poster is Due	0%	April 15
Final Poster	10%	April 16@ GC Banquet & April 26 in class
Final Proposal Document	20%	April 26
Team Minutes	5%	Due on Select Thursdays (See Schedule)
Peer Evaluations	4%	Due on Select Tuesdays (See Schedule)
Facilitator Evaluations	5%	Individual evaluation of each team member

Component Description

Six Solutions. As you explore the LARGER problem space, we would like for you to know the details of some of the current solutions. A BIG part of understanding the PROBLEM is understanding what people have done in the past or are currently trying to do to solve the problem.

Field Trip/Observations. Early in the term you will have to make at least one field trip to a local site and/or conduct field *observations* to develop “on the ground data” about your problem. The nature of this activity will vary with your chosen project topic. You will submit an assignment documenting this process.

Interview Experts. Early in the term you will be asked to conduct and prepare a written summary of a least *two* interviews of subject experts. These experts can be on campus or off campus. At least one expert must be a GT faculty member.

Test an Assumption. Based on the expert interviews and field observations, gather more data to refined your problem focus. This can be done via either 1) A quick experiment – one you can accomplish with little preparation or 2) A focused data search – one that is motivated by what you have learned. In either case, *the purpose is to test one key assumption ABOUT THE PROBLEM that you need to learn more about.*

5-Slide Presentation of Refined Problem Statement. From your weeks of field work, observations, and quick experiments, your group will prepare a 5-slide presentation focused on defining your problem statement in greater detail. Your slide deck should motivate the problem, explain why it is important, comment on current approaches to this problem, suggest why it is currently unsolved, and point to the direction your team is considering for tackling this problem. You have 5 minutes presenting time with 3 minutes for questions. The presentation will be in class over two days, and on the day your team is not presenting, you must perform an evaluation of two other groups.

5-Slide Presentation of your Solution Pitch. Taking into account, any feedback you get during your problem presentation. You will now prepare a 5-slide presentation to tell the story of the problem and pitch your proposed solution.

Prototype Something. They say a picture is worth a thousand words, and at IDEO they say a prototype is worth a thousand pictures! *If appropriate to your project, CREATE* something with the 3-D printers, mock up of a design, mock apps, or anything appropriate to your project so that you start to explore ideas in a concrete way.

Draft Proposal and Critique. Your team will prepare a draft proposal. Your proposal will be reviewed by the instructors and facilitators, and we will schedule discussions with each group to provide this feedback. There is no grade for this proposal draft, but in the past we have found this feedback critical for producing a more focused and feasible final proposal.

Final Poster Presentation. You will present your final poster twice at the end the semester. First, you will present your poster on April 16 at the end of the year banquet to faculty and visitors. You will then present your poster to faculty and visitors on the last day of class on Tuesday April 26th.

Final Proposal. This is the written document describing your final proposal. See assignment handout for details and format.

Team Minutes. Please see the Assignment #0 handout for details on submission and grading criteria of the team minutes. The minutes should, at a minimum, address the following questions:

1. Team Name and names of all team members
2. Your current "How might we..." statement
3. What are we trying to accomplish this week?
4. What did we learn over the past week?
5. What are we going to do next?
6. How well are we functioning as a team?
7. Who contributed what?
8. When did we have meetings, and who attended each?

Peer Evaluations. At key points in the semester, you will be asked to evaluate your peers. You will evaluate each teammate's

1. Quality of Contribution
2. Quantity of Contribution
3. Teamwork Skills
4. Attitude
5. Dependability
6. Overall Effectiveness

You must provide evaluations of all your teammates. Failure to provide evaluations will result in a drop in a letter grade for your own evaluation. These evaluations will be considered, privately, by the facilitator in developing an overall score for your team effectiveness over the semester.

Facilitator Evaluations. This will be the final facilitator assessment of each student in the class. Each facilitator will give a grade on a 5-point scale according to the following guidelines.

- 3 points – Highly active in group activities
- 2 points – Moderate interaction with group (some conversation)
- 1 point – Low interaction with group (only stares at group members)
- 0 points – Never interacting with group and no evidence of any contribution

plus

- 2 points – High interaction with Facilitator (listens and asks/answers questions)
- 1 point – Moderate interaction with Facilitator (listens attentively)
- 0 points – Low interaction with Facilitator (no attempt to engage)

Final Exam. There is no scheduled final exam. However, there is a final poster presentation and report. The final report and poster presentation is due the first day of "dead week." This requirement is consistent with Georgia Tech's "Dead Week" policy (General Catalog 2014-15 Section XII.C.4) as an "alternative assessment" to a final exam. See <http://www.catalog.gatech.edu/rules/12c.php>

Teaching Assistant Information

TA: Jonathan Gosyne
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Facilitator Information

Name: Courtney Di Vittorio, School of Civil and Environmental Engineering, Masters
Email: CourtneyDivittorio@gatech.edu
Initial Team Assignment: 50 Shades of Gray...Water & Clean it

Name: Muaz Rushdi, Department of Biomedical Engineering, Ph.D.
Email: nmnr3@gatech.edu
Initial Team Assignment: Sting the Stigma & The Prosthetics People

Name: Rylan Wolfe, School of Chemistry and Biochemistry, Ph.D.
Email: rwolfe8@gatech.edu
Initial Team Assignment: T-am (Recycle) & T.R.U.E. (Technology Recycling of Used Electronics)

Name: Hailey Bureau, School of Chemistry and Biochemistry, Ph.D.
Email: hbureau3@gatech.edu
Initial Team Assignment: Germbusters & Team 8 (Homeless)

Name: Weipeng Zhuo, School of Chemical and Biomolecular Engineering, Ph.D.
Email: wzhuo7@gatech.edu
Initial Team Assignment: Electric Slide & ICEBERGS

Name: Janille Smith-Colin, School of Civil and Environmental Engineering, Ph.D.
Email: jasc3@gatech.edu
Initial Team Assignment: Waste to Sustenance & Team Contra

Name: Ilya Gokham, School of Psychology
Email: igokhman@gatech.edu
Initial Team Assignment: Team Absens

Name: Hommood Alrowais, School of Electrical and Computer, Ph.D
Email: hommood.alrowais@gatech.edu
Initial Team Assignment: Surf N Turf & CURRENTLY the Best

Email: Name: Simone Johnson, School of Public Policy, Masters
Email: sjohnson@gatech.edu
Initial Team Assignment: Mediculture & Education Sensation

Name: Camille Barchers, School of City and Regional Planning, Ph.D.
Email: cbarchers3@gatech.edu
Initial Team Assignment: Model A

Policies

Attendance at all group sessions, presentations and lectures is essential to success in this course. If you are late by more than 10 minutes after the official class start time, you are considered absent! After two unexcused absences, each additional absences will lower your final grade by half a letter grade. Excused absences are those where a request was made to Dr. Davis 24 hours or more prior to the meeting, except in the case of illness, where documentation may be required.

All submitted documents should have the team name and names of all team members listed on a cover page, which does not count towards the page total.

All class announcements regarding the operation of this course – deadlines, clarifications, scheduling of presentations, etc.. – are made via the Announcements page of the t-square page for the course. You are expected to check you email daily for such announcements.

Late Assignments are not accepted unless other arrangements are made in advance. If arrangements are made, there will be a loss of a letter grade for each 24-hour period that an assignment is submitted late.

Honor Code. In this course plagiarism is the most likely source of Student Honor Code violations. Submission of material wholly or substantially identical to material created or published by another person without adequate credit notations indicating authorship constitutes plagiarism. Please use proper citation in presentations and reports. All students suspected of academic misconduct will be reported to the Office of the Dean of Students.

Team Dynamics. Your team will struggle. Sometimes with each other. Some of you have already experienced this. 1) Do not let little problems linger. Confront them before they become bigger. Little problems do not typically “go away.” 2) Try solving the problem amongst yourself. Part of being an effective team is being capable of honest discussion and openly discussing points of disagreement. 3) Contact your facilitator and Dr. Davis if the problem is getting out of hand.

Accommodations. If you have any learning disabilities that require special assistance, please obtain documentation from the Access Disable Assistance Program for Tech Students (ADAPT, 404-894-2564, Room 210 of the Smithgall Student Services Building).

Spring 2016 – TENTATIVE Day-By-Day Schedule

Date	Topic	Deliverable Items
Week 1: Tues. – Jan. 12	<ul style="list-style-type: none"> • Course Overview • Video Discussions 	
Week 1: Thurs. – Jan. 14	<ul style="list-style-type: none"> • Discussion with Facilitators • Tour of Invention Studio 	
Week 2: Tues. – Jan. 19	<ul style="list-style-type: none"> • Guest Speaker: Research Resources and the Georgia Tech Library • Handout on IDEO “Brainstormer” Session • Agree on your HMW statement that you would like to use for the brainstorming session. 	
Week 2: Thurs. – Jan. 21	<ul style="list-style-type: none"> • Demo TEAMMATES • <i>Ideate</i>: IDEO Group “Brainstormer” Session 	
Week 3: Tues. – Jan. 26	<ul style="list-style-type: none"> • Guest Speaker: Dr. Wendy Newstetter -- “Grand Challenges Scholar Overview” • <i>Ideate/Synthesis</i>: Organize brainstorm ideas into themes 	DUE: Six Solutions Report
Week 3: Thurs. – Jan. 28	<p>Free Time – Field Trip Time</p> <p>9:35- 10:15: Facilitator Meeting</p> <p>10:15 – 10:55: Optional Time with Wes/Jeff</p>	DUE: Team Minutes
Week 4: Tues. – Feb. 2	<ul style="list-style-type: none"> • <i>Synthesis</i>: Tell the <i>story</i> of your themes to another group! • <i>Synthesis</i>: Generate Combinational Matrix for Concept Map Generation 	DUE: Field Trip Report
Week 4: Thurs. – Feb. 4	<p>Free Time – Interview an Expert</p> <p><i>No Meetings This Day</i></p>	DUE: Team Minutes
Week 5: Tues. – Feb. 9	<ul style="list-style-type: none"> • <i>Synthesis</i>: Concept Map Generation • <i>Synthesis</i>: Share Your Map with another Team 	DUE: 1- Peer Evaluations

Week 5: Thurs. – Feb. 11	Free Time – Test Assumption 9:35- 10:15: Facilitator Meeting 10:15 – 10:55: Optional Time with Wes/Jeff	DUE: Team Minutes DUE: Interview Experts Report
Week 6: Tues. – Feb. 16	<i>Ideate Again:</i> “Brainstorming” Exercise (Generate: 25 ideas)	DUE: Test an Assumption Report
Week 6: Thurs. – Feb. 18	5-slide presentation to class on problem research	DUE: 5-Slide Presentation to Class
Week 7: Tues. – Feb. 23	5-slide presentation to class on problem research	DUE: 5-Slide Presentation to Class
Week 7: Thurs. – Feb. 25	<i>Assessment:</i> 2x2 Matrix with Criteria Axis (25 down to 7)	DUE: Team Minutes DUE: Evaluations of Two Groups
Week 8: Tues. – March 1	<ul style="list-style-type: none"> • Proposal Format Discussion (Draft is due in a month!) • <i>Assessment:</i> Multiple Criteria Evaluation • “There can be only one!” 	DUE: 2nd Peer Evaluations
Week 8: Thurs. – March 3	<i>Reflect:</i> Quick Experiment Design Creation Form (Story Board & Describe)	DUE: Team Minutes
Week 9: Tues. – March 8	Free Time – Experiment/Prototype 9:35- 10:15: Facilitator Meeting 10:15 – 10:55: Optional Time with Wes/Jeff	
Week 9: Thurs. – March 10	<ul style="list-style-type: none"> • <i>Reflect:</i> Discuss Progress with Facilitator and Another Group • Plan Quick Prototype Design 	DUE: Team Minutes
Week 10: Tues. – March 15	TBA	
Week 10: Thurs. – March 17	TBA	DUE: Team Minutes
Week 11: Tues. – March 22	SPRING BREAK	
Week 11: Thurs. – March 24	SPRING BREAK	

Week 12: Tues. – March 29	5-Slide Solution Pitch Presentation to Class	DUE: Presentation DUE: Proposal Due on Wed. March 30 by 11:59PM
Week 12: Thurs. –March 31	5-Slide Solution Pitch Presentation to Class	DUE: Presentation
Week 13: Tues. – April 5	<ul style="list-style-type: none"> • Interview Week (No Class) • Contact Expert for Feedback 	DUE: Evaluation of 2 Groups
Week 13: Thurs. – April 7	<ul style="list-style-type: none"> • Interview Week (No Class) • Contact Expert for Feedback 	DUE: Team Minutes
Week 14: Tues. – April 12	<ul style="list-style-type: none"> • Poster Session Overview • Get Feedback from Facilitators • Work on Poster Banquet 	
Week 14: Thurs. – April 14	<ul style="list-style-type: none"> • Work on Poster for Banquet • Put up Poster for Review 	DUE: Team Minutes DUE: (April 16) Banquet Poster
Week 15: Tues. – April 19	Lecture and Discussion: <i>“Working with Human Subjects and IRB”</i>	DUE: 3rd Peer Evaluations
Week 15: Thurs. –April 21	TBA	DUE: Team Minutes
Week 16: Tues. –April 26	Poster Presentation	DUE: Final Proposal
Week 16: Thurs. –April 28	Reading Day – NO CLASS	