

INTRODUCTION TO ISYE 4800 SENIOR DESIGN PRE- PLANNING

March 5 2019

CREATING THE NEXT®



Topics

- What are 4106 and 4800?
- What you need to finish in 4800?
- When you need to do what?

Faculty Team in 4800 – Fall 2019

Name	Email	Role	Function
Prof. Dima Nazzal	dima.nazzal@gatech.edu	Coordinator	Info session, coordinate activities
Prof. Dima Nazzal	dima.nazzal@gatech.edu	Co- Examiner	Project screening
Prof. Natasha Boland	natashia.boland@isye.gatech.edu	Co- Examiner	Project screening

What is Senior Design in ISyE

- Student teams seek a client's IE-related opportunities
 - Provide significant value to client using IE methodology
- What do project clients get out of it?
 - Implementable ideas, supporting analysis, prototype software, ...
 - Significant value to client (a course requirement/focus)
- What do GT students get out of it?
 - Transition from academic to professional life
 - Professionalism, communication, project management, teamwork, etc.
 - Real engineering project experience

Senior Design is more than other courses

- Be inspired to do something impactful
- Be professional under pressure
- Be prepared to broaden and deepen knowledge
- Ask the right questions before finding the right answers
- Improve your communication skills
- Improve your computing skills
- A lot of help, if you are looking for it
- ...

Be professional

- Be punctual
- Have a good attitude
- Take initiative
- Be responsible and reliable
- Develop work ethic
- Be prepared
- Cooperate
- Be honest and ethical
- ...

To paraphrase Dr. Adam Grant: “Argue like you're right, but listen like you're wrong. Instead of arguing to win, you can argue to learn. Acknowledge when a good point has been made. Acknowledge your weaknesses.”

Professionalism starts now!

- Failure to meet deadlines or follow instructions can lead to grade deductions carried to 4106.

Prerequisites for 4106 Senior Design

1. ISYE 3025, ISYE 3133, ISYE 3232, ISYE 3044 (and the prerequisites to these courses)
2. 4 of 6 ISyE concentration elective courses
3. Successful completion of ISYE 4800
 - Approved preproposal
 1. Team Composition
 2. Client Notification
 3. Project Pre-proposal
 - Sufficient contribution to an approved preproposal

Tasks in (or before) ISyE 4800

1. Register for ISyE 4800A/4800Q/4800R
 - Q is for students taking SOUP classes (summer only)
 - R is for study abroad students
 - A is for everyone else
 - If you already took 4800 before, you must re-take
2. Form team of size from 6 to 8
3. Find potential clients
 - Postings on ISyE website
 - Past senior design teams
 - Internships and co-ops
 - Cold-calling
 - Site visit (virtual) is required
4. Develop the pre-proposal and get approved

4800 Deliverables and Schedule

Deliverable	Details	4800 Summer semester	4800 Fall semester
Team composition report	Students submit team members, liaison, and resumes	Monday in the week final exams starts in spring semester	Monday of 5 th week in fall
Client notification report	Students submit a report listing the client name and nature of the project	3 rd Monday in the summer	7 th Monday in fall
NDA Routing Form	If your client requires an NDA	As soon as you have talked to your client. Process for approval is lengthy	As soon as you have talked to your client. Process for approval is lengthy
Initial pre-proposal	Students submit initial pre-proposal	7 th Monday in the summer	10 th Monday in fall
Meetings with project screener/examiner	A faculty member will be assigned to work with you to shape up the pre-proposal		
Revised pre-proposal	If the initial proposal is not approved, a student can submit a second one. It can be an enhanced version of the first or another project with a different client	10 th Monday	13 th week
Peer evaluation	Students assess every other team member (including themselves) for contribution	12 th Tuesday	16 th Tuesday
Permit to ISYE 4106 to your section	Registration permit to your section will be issued if you satisfy the requirements	Phase II registration during the 4106 semester	Phase II registration during the 4106 semester

TEAM COMPOSITION

Step 1: Build yourself a team

- KEY: Be able to trust their work & work ethic
- Similar academic goals: A for winners vs. D for done
- Diverse skill set: Cover all skills with one or two members
- Compatible 4106 class schedules: no classes conflict with one of two team class schedule: MW or TR sections

	M	T	W	R	F
12:00 – 2:45		TR		TR	
12:10 – 2:55	MWF		MWF		MWF
6:00 – 8:45			MWF TR	TR	

Step 1: Build yourself a team(cont.)

- Students you have worked with, been in class with, post on 4800 Piazza board
- Once you have a team, get together outside of senior design
 - You'll get along better during the semester

Team Composition Report template

- Each team submits one report to course website by the team liaison person
- File name: team liaison's last name + Team
- Date:
- Team members in a table(including Liaison) and information in alphabetical order

Family Name *	Given Name	Working GT email	Preferred 4106 section

- **Please use * to indicate the liaison person.*
- *** All team members must have classes that can fit in the same 4106 section type*
 - *Section type MW: MWF 12:00 – 3:00, W 6:00 – 9:00*
 - *Section type TR: TR 12:00 – 3:00, WR 6:00 – 9:00*
- Resume for all members in alphabetical order
- Compile everything together in a single file to submit to T-Square
- Submit to online [form](#)
- **Under extenuating circumstances, the coordinator has the coordinator to add, remove, and change the team*

CLIENT COMPOSITION

Step 2: Finding a project:

Sample of past project topics

- Activity valuation
- Capacity management
- Customer service enhancement
- Demand/price forecasting
- Distribution network design
- Energy usage reduction
- Equipment replacement planning
- Facility layout/redesign
- Flow management
- Inventory planning
- Manufacturing line/cell design
- Materials handling
- Money/capital management
- Pricing strategy
- Preventative maintenance scheduling
- Process design/redesign
- Production scheduling
- Supply chain design
- Technology integration
- Vendor selection
- Waste reduction
- Workforce scheduling
- Flow of material, people, documents

Project Clients, 2005-2018, (Feel free to add to the list!)

- Acuity Brands
- ADEX Machining
- Aerotron
- AGL Resources
- AirTran
- Alternate Apparel
- Amazon
- American Birkebeiner
- American CyberSystems
- Anheuser-Busch
- AT&T
- Atlanta Brewing Company
- Atlanta Community Food Bank
- Atlanta Gas Light
- Atlanta Gastroenterology Associates
- Atlanta Journal-Constitution
- Atlanta Regional Commission
- Avery Dennison
- Avnet
- Bella Cucina
- BellSouth
- BlueLinX
- Buckhead Baseball
- Burger King
- Burt's Bees
- CAB
- Canvas Systems
- Cardiovascular Associates
- CARE
- Carrier Europe
- Carter's
- Caterpillar
- Cbeyond
- Centers for Disease Control and Prevention
- Centro de Agencias
- Chick-fil-A
- Chico's
- Children's Healthcare of Atlanta
- Cisco Systems
- City of Atlanta
- Coca-Cola
- Coca-Cola Enterprises
- Coca-Cola North America
- Coca-Cola Refreshments
- Comcast
- Cooper Industries
- Cox Communications
- CR Bard
- Craft-Art
- CrossLink
- CYI Gifts
- DeKalb County
- DeKalb County Police Department
- DeKalb Medical Center
- Delta
- DHL
- Dick's Sporting Goods
- e2M
- EarthLink
- EGO North America
- Elesys
- Emory Crawford Long Hospital
- Emory University Healthcare
- Emory University Hospital
- Energy Dispatch
- Enraf
- Equifax
- Exel
- Express
- F&P Georgia Manufacturing
- Flu-Free Schools
- Flying Lizard Motorsports
- Fulton County
- GE Energy
- General Mills
- Georgia Aquarium
- Georgia Poison Control
- Georgia Power
- Georgia Tech Athletic Association
- Georgia Tech Campus Recreation Center
- Georgia Tech Capacity Planning and Space Management
- Georgia Tech Library
- Georgia Tech Office of Undergraduate Admissions
- Goody Products
- Grenzebach
- Gwinnett County Public Schools
- Gypsum Management & Supply
- H.C. Brill
- Heidelberg
- High Museum of Art
- HNI
- Home Depot
- HON Furniture
- Honda
- Honeywell
- House of Cheatham
- ICF International
- IKEA
- iKobo
- Innovate
- Intel
- InterContinental Hotels Group
- Interface
- iDynamics
- JC ATM Services
- Kimberly Clark
- Kubota
- Landis Gyr
- Legacy Property Group
- Lockheed Martin
- Macy's
- Manheim Auto Auctions
- Marcus Autism Center
- Marmi Natural Stone
- Mars
- Matador Distributing
- McKenney's
- McKesson
- McLane
- MedShare International
- Metro Atlanta Regional Transportation Authority
- Michelin
- Midtown Consulting Group
- Monday Night Brewing
- MSC
- NCR
- Newell Rubbermaid
- Next Wave
- Nissan
- Norfolk Southern
- Northside Hospital
- Office Depot
- OHL
- PACCAR Parts
- Panasonic
- Pepsico
- Phillips 66
- Piedmont Fayette Hospital
- Piedmont Heart Institute
- Piedmont Hospital
- Piedmont Newnan Hospital
- Platt Electric Supply
- Porsche
- Pratt & Whitney
- Predictix
- Project Open Hand
- Publix
- RaceTrac
- Relay Bikes
- Radiant
- Rainmaker
- Reliance Electric
- Remington Medical Supply
- RMI
- RockTenn
- Rockwell Collins
- Roswell Recycling
- Ryder
- Saia
- Salvation Army
- Sandoz
- Sandvik Mining & Construction
- ScheduleWise
- Scientific Atlanta/Cisco
- Shaw Industries
- Sherwin Williams
- Siemens
- Southeastern Pneumatic
- Southern Company
- Spectral Response
- Starline Associates
- Summit Industries
- SunTrust
- SynQ Solutions
- The Children's School
- Textron
- Titin
- Toyota
- TriVantage
- Tyco Healthcare
- Tyco Safety Products
- UNC Healthcare
- UNICEF
- United Distributors
- United Nations High Commissioner for Refugees
- United Nations World Food Programme
- UPS
- UPS Capital
- UPS Global Health
- USG
- UTI
- Vertical Brands
- VF
- Virgin America
- Virginia Dominion Power
- Volunteer Express
- Waffle House
- Wal-Mart
- Weir Furniture
- WellStar Kennestone Hospital
- Whirlpool
- WIKA
- Windstream
- World Health Organization
- ZF Industries

Step 2: Finding Project: *Requirements*

- Requirements
 - Design
 - Make recommendations to change an existing system or design a new system, not just a tool or an analysis or a model
 - ISyE knowledge/methods
 - Magnitude
 - 12 hrs/person/week = 1080-1440 hrs total (full-time job \approx 2000 hrs)
 - Value to client
 - Part of Senior Design is learning to identify which problems are worth your time to fix and which are not
- Also...
 - Should be very interesting to you
 - If you don't like it now, you'll *hate* it after 1000+ hours!

Step 2: Finding a project

Approaching potential clients

- How to approach companies for a project
 - Engineers, managers, etc. – they have the work to be done!
 - Not human resources or university relations
 - Ask in a way they understand
 - IEs vs. non-IEs
 - Make a personal approach
 - Personal visit, phone call
 - Be prepared
 - “Elevator speech” & details
 - Information about Senior Design & you

Expectations of Project Clients

- Commitment to providing access to data & site
- Selection of a primary contact/champion for team
 - Client-side organization (meetings, site visits, data, questions, etc.)
- True interest in project
 - Real value, not busywork!

Risk and reward factors in project/client selection

- Consulting firms
- Startups
- Small operations
- Access
 - Information
 - Response time
 - Location
- Participation

Client notification

- Organization Name
- Client Contact Name, Email, Phone
- Describe the Organization you will work with
- Describe the system you propose to study, design, re-design
- Describe the opportunities for improvement
- Describe the opportunity's worth/value to client
- Describe what you will deliver to the client
- Describe the relationship of your potential project to the ISyE curriculum

NDA PROCESS

Client may share proprietary or confidential information

Proprietary

- Formula
- Financial info (salary)
- Methods or strategies
- Marketing plans
- Customer list
- IT system details
- ...

Confidential

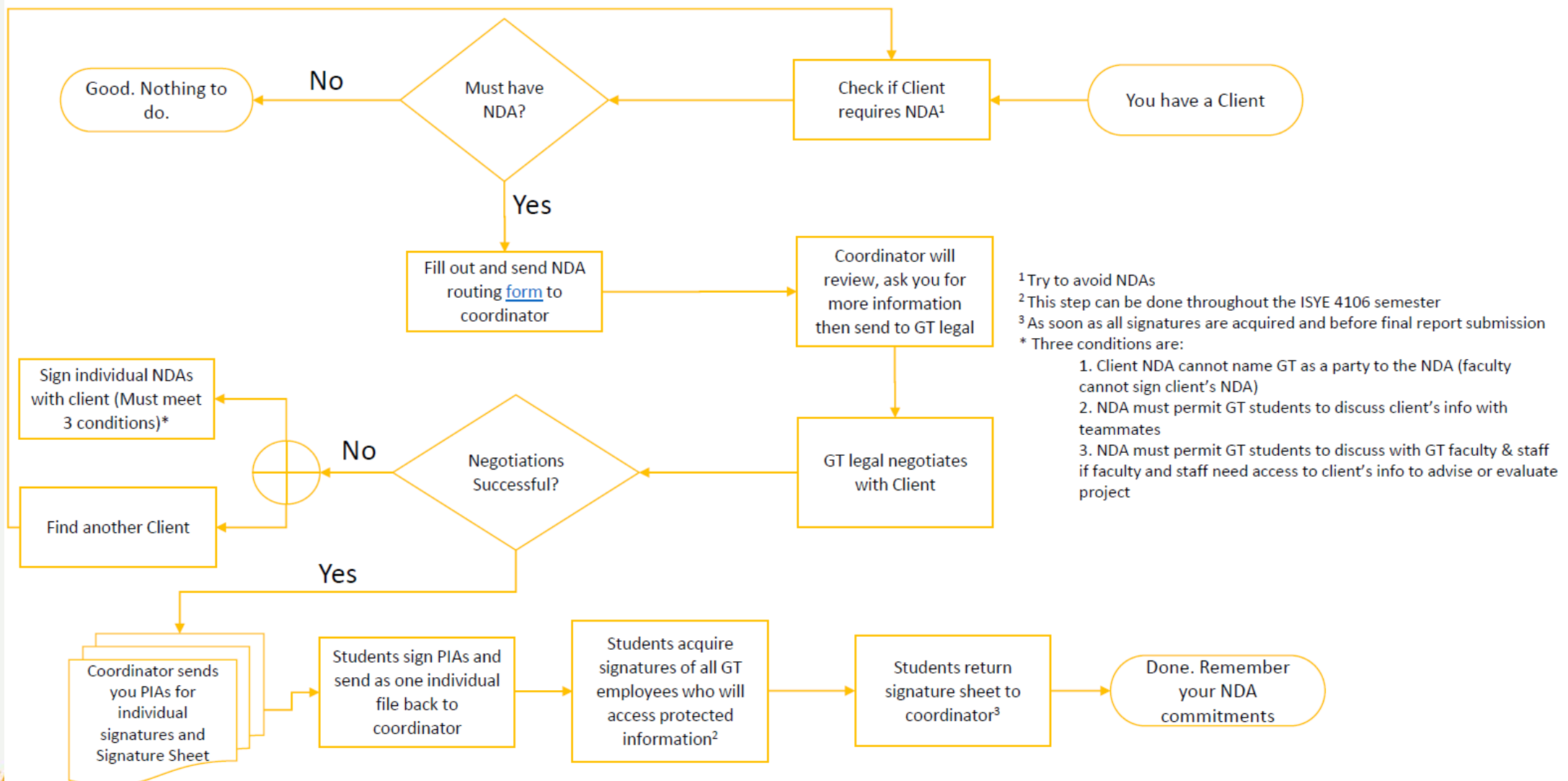
- ID
- SSN
- Account info
- Intellectual property
- Patient information
- Passwords
- ...

Client may ask you to sign their legal agreement

What should you do?

1. Ask the client to filter or mask the data to avoid the NDA. It is just a one-semester undergrad project
2. Undesirable: Individually sign the client's NDA
 1. GT employees are not allowed to sign client's NDA
 2. It must allow GT employee acceptable access, or no grade!
 3. Quick and dirty in the short run, risk in the long run
3. Individually sign client's NDA to allow access to data and at the same time start the GT-Client NDA process
4. **GT-Client NDA:** If you must have an NDA, below is the way to go.

Student NDA process



NDA Routing form

- Liaison fills out
 - Company's contact info
 - Class/Project details
- Send it to me for my signature and date
- I will send it to GT Legal. Please do not contact GT Legal.

GT Faculty Coordinator Information

Name: Dima Nazzal

Title: Director of Professional Practice

Department: ISyE

Mail Code: 0205

Email: dima.nazzal@gatech.edu

Phone: (404) 894-3037

Alt. Phone:

Fax: (404) 894-2301

Administrative Assistant: Harry Sharp
(Name)

Email: harry.sharp@isye.gatech.edu

Phone: (404) 894-6545

Company's Contact Information

Company Name:

Technical Contact:

(Name/Title)

Phone:

Email:

Contracts/Legal Contact:

(Name/Title)

Phone:

Email: paula.kinley@hanes.com

Class/Project Details

GT Course Information: ISYE 4106 Senior Design
(GT Course ID/Title)

Academic Semester: Fall Spring

Estimated Start Date for Disclosures: 08/13/2018

Project Title (if available):

Please provide a brief description of the proprietary/confidential information which may be disclosed to GT as a result of this project:

Cost/unit on finishing type, customer requirements for all Value Added Service processes, data on total

Are any GT students working on this project foreign nationals? Yes No

If "Yes," please list which countries: South Korea, China

I have completed this form to the best of my knowledge. I understand that the Company's contracts/legal contact should be authorized to negotiate & approve changes to the NDA on the Company's behalf. If the Company does not anticipate disclosing proprietary/confidential information for this Project, then an NDA is not necessary. Neither the finalized NDA nor this form is considered proprietary/confidential information & both are subject to the Georgia Open Records Act. The above requested information is necessary; failure to fully complete &/or sign this form may cause a delay in processing this request.

GT Faculty Coordinator Signature: Dima Nazzal

Digitally signed by Dima Nazzal
DN: cn=Dima Nazzal, o=Georgia Institute of Technology, ou=Industrial and Systems
Engineering, email=dima.nazzal@gatech.edu, c=US
Date: 2018.08.10 15:06:31 -0400

Printed Name: Dima Nazzal

Date: 8.10.2018

Please email the completed and signed NDA Routing Form to asklenal@gatech.edu.

Student PIA

Student Proprietary Information Agreement

THIS AGREEMENT entered into by and between The Board of Regents of the University System of Georgia by and on behalf of Georgia Institute of Technology, a nonprofit educational institution organized and existing under the laws of the State of Georgia, and having its principal offices at 225 North Avenue, Atlanta, Georgia 30332 ("Georgia Tech") and the Georgia Tech student as identified below, ("Student");

WITNESSETH:

WHEREAS, Georgia Tech may receive information that is proprietary to ("Company"), for use in a Senior Design Course Project ("Project") in Fall / Spring Semester of 20.

WHEREAS, Georgia Tech and Company have entered or will enter into a Proprietary Information Agreement (hereinafter called "PIA"), which is incorporated herein for reference, to protect the confidentiality of Company's Proprietary Information as defined in the PIA;

WHEREAS, Student desires to have access to such Proprietary Information by virtue of his/her participation in the **Senior Design Course, ISyE 4106, in the School of Industrial and Systems Engineering at Georgia Tech**;

NOW THEREFORE, in consideration of the mutual covenants herein, Student and Georgia Tech agree as follows:

1. Georgia Tech shall grant the Student access to the Proprietary Information.
2. Student covenants with Georgia Tech to perform all obligations placed upon Georgia Tech in the PIA between Company and Georgia Tech, attached hereto and incorporated herein by this reference.
3. Company shall be a third-party beneficiary to this Agreement and may bring action directly against the Student for his/her violation of the PIA.
4. This Agreement shall be governed by the laws of the State of Georgia.
5. The term of this Agreement, during which Proprietary Information may be exchanged, shall begin as of the date first written above, and shall expire at the expiration of the PIA. However, the expiration of this Agreement shall not relieve Student of his/her obligations hereunder regarding the protection and use of Proprietary information disclosed hereunder prior to the expiration date.
6. This is the entire Agreement between the parties relative to the exchange of Proprietary Information concerning the Project and it supersedes any prior or contemporaneous written or oral agreements thereon and may not be amended or modified except by subsequent agreement in writing by duly authorized officers or representatives of the parties.

BY MY SIGNATURE BELOW, I HEREBY AGREE THAT I HAVE CAREFULLY READ, UNDERSTAND AND AGREE TO ALL OF THE TERMS AND CONDITIONS HEREIN AND CERTIFY THAT I AM 18 YEARS OF AGE OR OLDER, LEGALLY COMPETENT TO EXECUTE THIS AGREEMENT, AND I FREELY AND VOLUNTARILY ENTER INTO THIS AGREEMENT.

Student's Signature:

Student's Printed Name:

Student's Home Address:

Date:

<input type="text"/>
<input type="text"/>
<input type="text"/>
<input type="text"/>

GT Legal fill out these

1. Liaison gets each member to fill out these 4 fields, and sign
2. Liaison combines into single file
3. Liaison sends the file to coordinator

GT Legal fill out these

The signature sheet SS (2nd page)

Please return a copy of this page with the appropriate signature(s) to:
matthew.riddle@legal.gatech.edu OR (fax) 404.894.3120 (NOTE: A cover page is not necessary.)

*NDA with: Atlanta National League Baseball Club, LLC
 Attorney: SDE GT OLA File: NDA-5150 POC: Dima Nazzal
 GT Entity GIT Effective Date: August 3, 2018 Termination Date: December 15, 2018
 Term of Confidentiality: 3 years/initial date of disclosure Pertaining to: customer traffic flow during baseball games, including surveillance videos, customer feedback and transaction data and the Point of Sale for the transaction. ISYE 4106, Fall 2018.

Required Signatures

The employees who have signed below acknowledge that they will have access to proprietary information disclosed under the referenced NDA, have read the NDA and agree to comply with the terms and conditions thereof.

Signature: _____
 Name: Dima Nazzal
 Date: _____
 U.S. Citizen Green Card Neither
 If Neither, Country of Origin: _____

Signature: _____
 Name: _____
 Date: _____
 U.S. Citizen Green Card Neither
 If Neither, Country of Origin: _____

Signature: _____
 Name: _____
 Date: _____
 U.S. Citizen Green Card Neither
 If Neither, Country of Origin: _____

Signature: _____
 Name: _____
 Date: _____
 U.S. Citizen Green Card Neither
 If Neither, Country of Origin: _____

Bring with you to presentations
 Get signatures
 Submit with final report
 We cannot read without having signed

PREPROPOSAL REQUIREMENTS

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Project Pre-Proposal

- Convince project screeners/examiners that your project is appropriate
 - Design content, ISyE methodology, difficulty, value
- Convince with evidence: data/analysis, not just (buzz) words!
 - Opportunity statement
 - Data/analysis to support the size/scope/value of opportunities
 - Proposed type of deliverables
 - Connection to ISyE discipline
 - Writing quality (spelling, grammar, typos) counts too!
- Get help from writing specialist

You will receive permit for 4106 only if your pre-proposal is APPROVED by the senior design examiners and your contribution is satisfactory

We will guide you through the process but it's on you to get your project into an approvable form. You don't have a good project you will NOT get permit.

Project Pre-Proposal (cont.)

- Show evidence that the project will be valuable...
 - This is a CRITICAL skill.
 - If you're good at making the case that you're worth paying, you're likely to have a very successful career in any field.
 - You must learn this... in Senior Design.

Preproposal Template

- Who is the Client?
- Client contact information
- What is the system?
- Is an NDA required?
- What is the Opportunity?
- What type of information you need to take on the challenge?
- What is the value of the opportunity you identified?
- What will you deliver to the client?
- What is the relationship to the ISyE curriculum?

First Draft Acceptance Rate:

- < 10% are accepted
- > 50% require major changes
- ~ 15% need to change client

What is an Opportunity Statement?

- It requires:
 - A **motivation** (e.g., sales are down by 13% last year or customer ratings went down, etc.)
 - A **goal** (e.g., reduce cost, increase revenue, improve customer service, etc.) and this should be consistent with the motivation
 - **Success Metrics:** How we measure your success in the project? (e.g., percent decrease in labor cost)
 - Remember that it's impossible to measure in the timeframe of senior design
 - **The opportunity:** What do you bring to the table to achieve the goal? (e.g., an inventory control system, truck routing, consolidating shipments, predictive maintenance process, etc.)
 - We will evaluate your work product based on the strength of the evidence that your proposed solution:
 - is the right approach to achieve the goal, and
 - the magnitude at which it achieves the goal

Tips and Pitfalls

- Goal vs. Tasks: You are not supposed to be given tasks. It's your job to identify the tasks to achieve the goal
 - Start with the Goal
 - Logically dissect all the steps in the process that can help achieve the goal,
 - Identify the alternatives for exploiting them,
 - Prioritize based on impact and effort.
- Disparaging the Client will not be tolerated
 - Do NOT motivate your project by pointing the shortcomings of the current process
 - Focus on what you bring to achieve the goal not what the client is not doing

DON'T FORGET!!

- REGISTER FOR ISYE 4800/4800R/4800Q
- 4106 PREREQUISITES
- START NDA ASAP, FOLLOW INSTRUCTIONS
- PRE-PROPOSAL MUST INCLUDE DATA AND VALUE

Communications

- Meaningful email subject line
- Meaningful document name (pay attention to template)
 - Team: Liaison's name
 - Client notification: TeamNumber + ClientName (to be given)
 - E.g. 11 Staples
 - Preproposal: TeamNumber + ClientName + Type of project
 - E.g. 11 Staples OrderPicking (to be given)
- Piazza

Warnings

- You must contribute to your team's preproposal; being out of town is NOT an excuse.
- You cannot drop a team without Associate Chair approval
 - Once your preproposal has been submitted, individuals will not be allowed to switch teams.
 - Obvious exception: serious health issues, etc.
 - No exceptions for unhappiness with team, project, expected grade, etc.
- Failure to complete any ISyE required course or 4 of 6 concentration classes will result in you being dropped from your team

4800 FAQs

- Do I have to meet with an examiner after initial preproposal submission?
 - Yes, unless you live/work outside of driving distance.
- What if I live/work far away this semester?
 - You're still expected to contribute to the project-finding and preproposal effort. Shirkers will be penalized; most semesters, one or more students have not been given a permit with the rest of their team.
- Will you have office hours?
 - Don't wait for office hours. Time is of the essence, so ask your questions right away.
 - Send me your questions by email – wherever I am, I'll be able to give you a pretty quick answer.
 - Piazza is an excellent way of communication on the course website (Canvas) but not until the summer semester when you are registered in an actual class.
- What happens if we miss the deadline for pre-proposal submission?
 - 1/3 letter grade deduction from your ISYE 4106 grade.

What to look for in 4106

- Advisor assignment, toward the end of the 4800 semester
- Mandatory Peer Evaluation toward the end of the semester
- Mandatory 4106 Introduction session: Wed in first week of class, 6 – 8 PM
- Exciting work of senior design
 - Freedom
 - Challenges
 - Achievements
 - ...

Questions?

- dima.Nazzal@gatech.edu
- Later, your assigned examiner or advisor
- Please don't ask other faculty

Questions you should know the answer to...

- What are the prerequisites for 4106?
- What do you do if your client wants an NDA?
- What is the process to get GT-client NDA?
- What do you have to do this semester?
- How to get permit to register for 4106?
- I will study abroad, can I be in 4800?
- I will co-op in Seattle, can I be in 4800?
- What happens if I withdraw from 4th concentration elective?
- What happens if I fail one of the 4 concentration electives?