

IE 477/478 Systems Design: Analysis and Synthesis

Second Week: Essentials

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Course Coordinators

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University-Industry Collaboration
Student Projects Coordinator

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Teaching Assistants

23 September 2022



System view

Factories, banks, restaurants, online shopping sites, airlines,

- *divide into parts:*
inventories, production lines, manpower, orders, customers
- *study parts and their interrelations:*
correlated demand, pull, push, precedence, starvation, wip, loss sales, risks
- *synthesize:*
demand forecasts, basestock levels, production schedules, maintenance

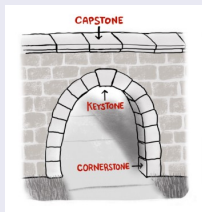
Course mission

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Capstone



Build a path/gate to solution for problems

- Cornerstones: IE 303, IE 325 (modeling, optimization)
- Keystone: IE 375 (resource allocation of all kinds)
- Capstone: IE 477/478 (analysis and synthesis)

The whole is more than the sum of its parts.

Timeline

23
Sep
Fri

Today

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23
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Fri

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3
Oct
Mon

21
Oct
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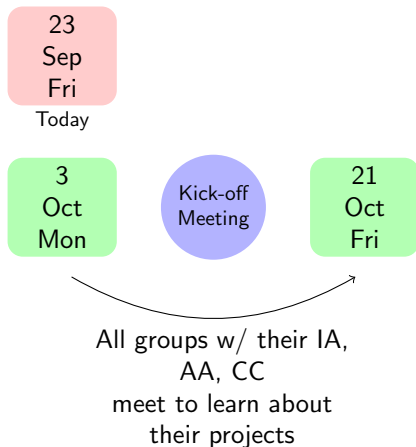
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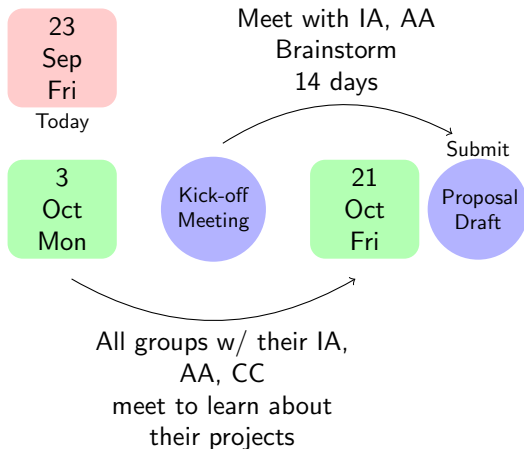


All groups w/ their IA,
AA, CC
meet to learn about
their projects

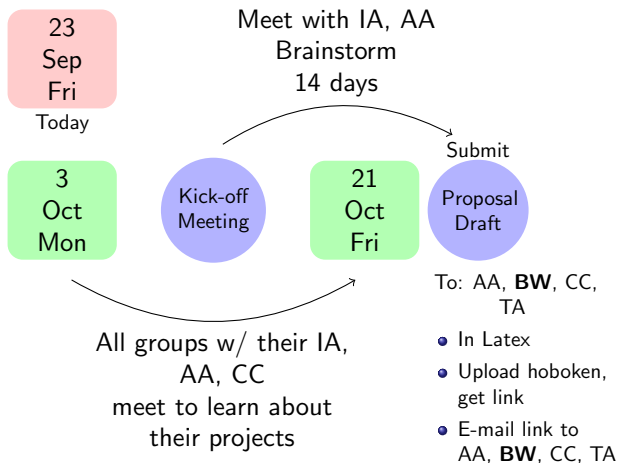
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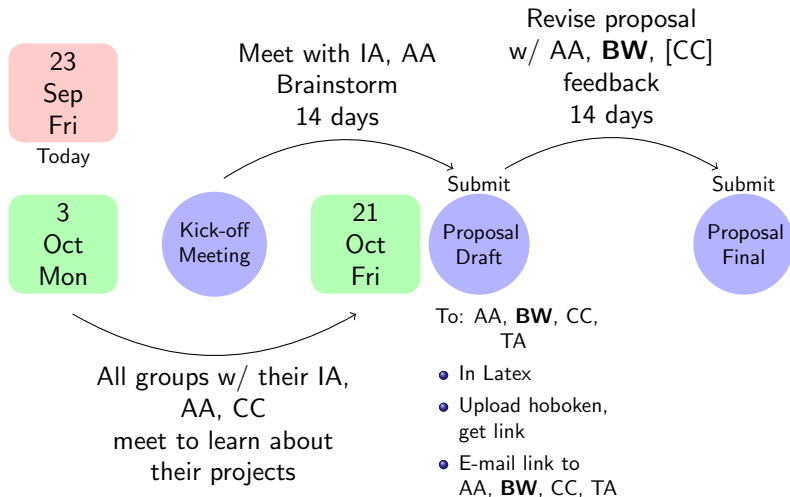
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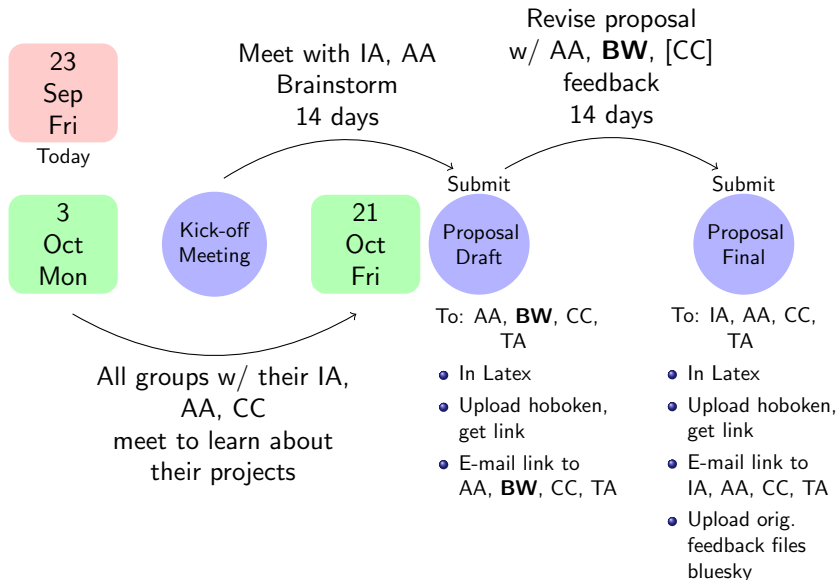
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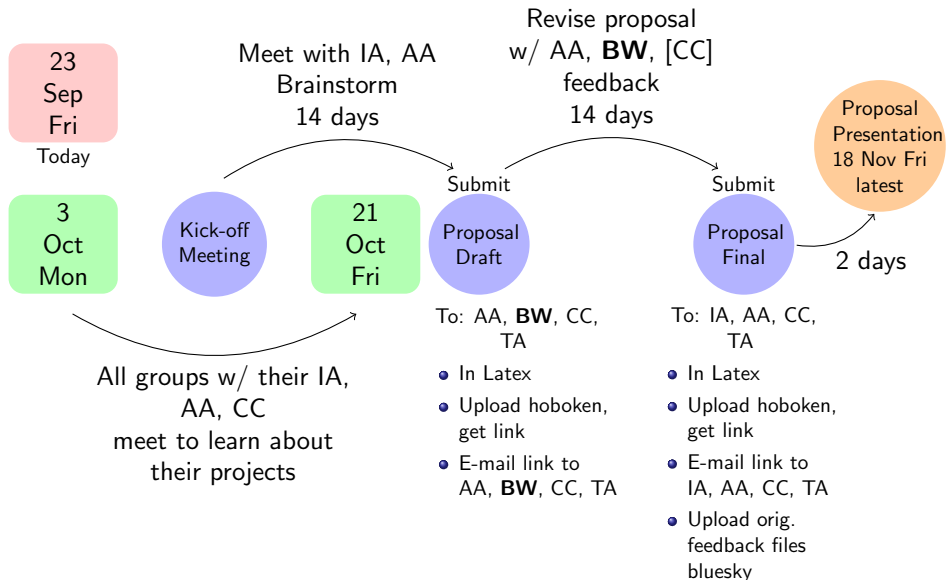
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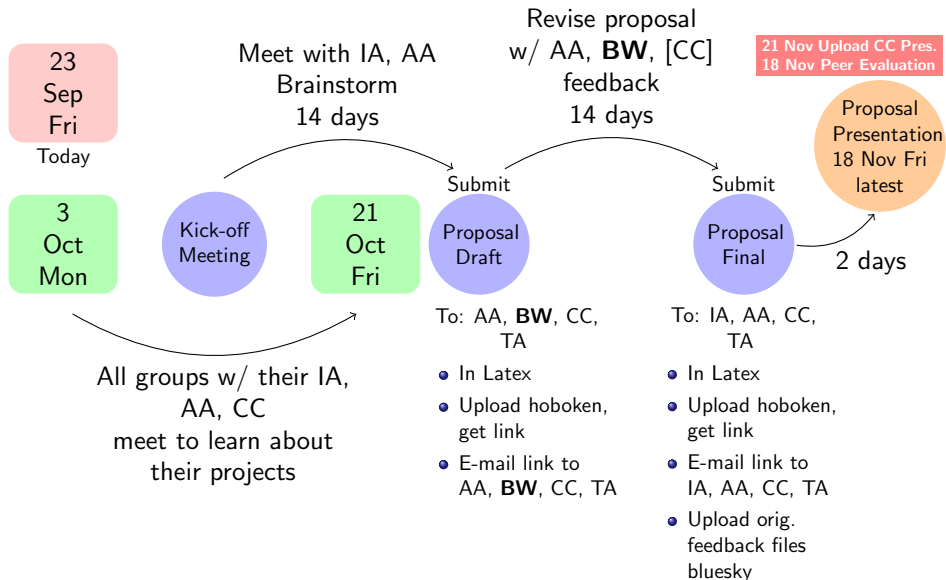
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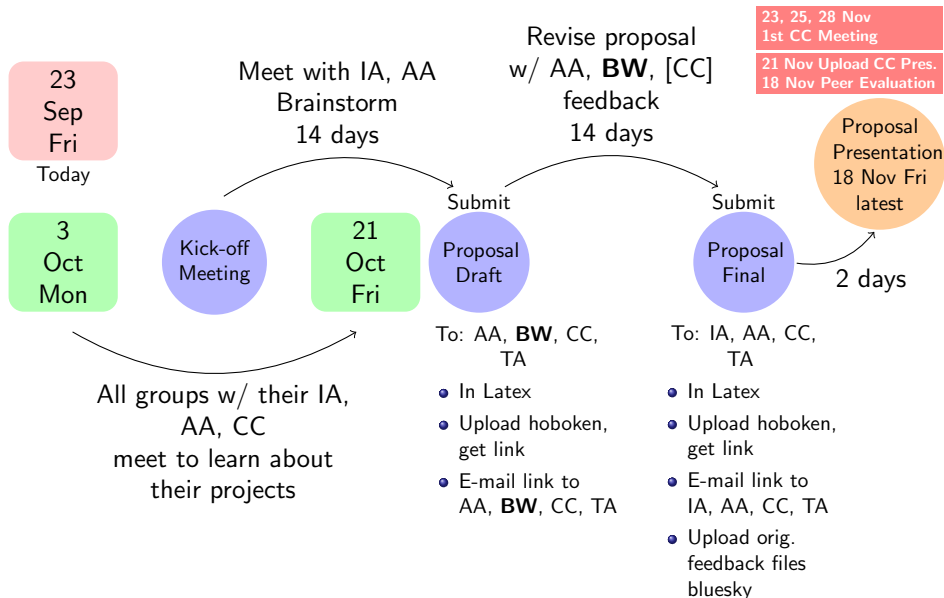
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decision support system, user interface, in Python, R, etc., user guide

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 - split in work packages
 - timetable for when to start and finish
 - who are responsible for each work package
 - use built-in Gantt chart of **project management system** on bluesky

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- Agreeable by IA, AA, CC, the group

- meet regularly with IA and AA
- keep minutes of the meeting:
 - what are new actions to be taken?
 - who is responsible for each task?
 - use **project management system** on bluesky

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 - inventory models, EOQ, (S,s) -policy, basestock policy, safety stock
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 - read *peer reviewed* articles, follow citations in the articles
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- Critical thinking
 - can the real problem be different than what company described?
 - can there be a solution approach better than what IA, AA, CC may suggest?
 - are the assumptions realistic?
 - are all of important constraints stated?
 - can you solve LP, MIP in acceptable time? do you need a heuristic?

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- busy – go prepared with qtns
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- CP:
- always available accessible
 - punctual in passing messages
 - kind

We can dismiss CP if s/he does not fulfill the expectations.

Roles and expectations, continued

Yeşim Gülseren
University-Industry Collaboration
Student Projects Coordinator

- Seeking projects from companies
- Communication with industrial advisors
- Overseeing project budgets and ensuring their proper use
- Enforcement of non-disclosure agreements
- Organizing course seminars (e.g., project management, teamwork)
- Approval of legitimate project budget spending requests
- Mentoring students on patent applications and entrepreneurship
- Guidance for students to apply for TUBITAK student grants
- Support for project fair organization
- Career advise for students after graduation

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- double M/C number. Can you solve in 30 mins?

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- performance measure
 - fill rate
 - cost/profit
 - multiple?
- compare proposed & current system
- how?
 - simulation?
 - pilot study

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Rest of May: reports,
CC meetings, fair

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 - Use [TeXStudio](#) to write your report. See [LaTeX Tutorial](#) for details.
 - Read answers or post questions on [LaTeX Issues](#).
- before writing proposal report go to course homepage and read
 - [IE 477 – General Tips on Writing Reports](#) (1 page)
 - [IE 477 – Suggested Contents for Proposal Report](#) (3 pages)

For the upcoming reports (first progress report in fall, second progress, final, and booklet reports in spring) go to [Information on Reports](#) page.

Teamwork

- be professional, respectful, responsible
- CCs will check each member's contribution with questions during CC meetings.
- meet AA and IA regularly.
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- do not forget to fill the peer evaluation forms. If you fail, then your grade will be lower.

- often come late
- can be incomplete and inaccurate
- always have plan B. Perhaps simulate data
- we will not accept “lack of data, poor data quality, etc.” as an excuse for an “empty” report.

PROJECTS

Received 33 projects.

Rank them.

Submit preferences by 17:30 today.

Projects

- 9 Arçelik, 1 Renault, 1 Eti, 1 Doğadan, 1 Unilever, 1 FNSS, 1 Meteksan
- 5 Bakioğlu
 - is in packaging industry,
 - their customers include Eti, Ülker, Unilever.
- 4 Oplog
 - rents storage space to small businesses, handles their online orders, ships them from storage in lieu of the business, similar to Amazon
- 2 Norm Fasteners
 - produce fasteners for automotive industry (FIAT, Renault, Audi)
- 2 Demir (Koç Holding)
 - operates in mining industry
 - IK (HR - Human resources analytics) project
- Supply Chain Wizard
 - consulting firm
 - uses AI to mine big data in order to solve business problems
 - founder is a Bilkent alumni
- Solvoyo
 - consulting firm specializing in supply chain management
 - founder is a Bilkent alumni

Projects continued

- UNDPS UNDP IICPSD SDG AI Lab
 - United nations artificial intelligence Lab
 - The only nonprofit organization
- Kokteyl Bilgi Teknolojisi Hizmetleri
 - advertising industry
 - revenue management, pricing
- Infina
 - works for Plan-S Satellite & Space Technologies Inc.
 - produces smart cards for satellites.
- Tepe Betopan
 - facility layout project run directly by the CEO
 - Bahar Y. Kara will be the AA
 - Emre Uzun will be the CC