Week 1

GSOE9820 Engineering Project Management

Term 3

Dr. Yu Jing

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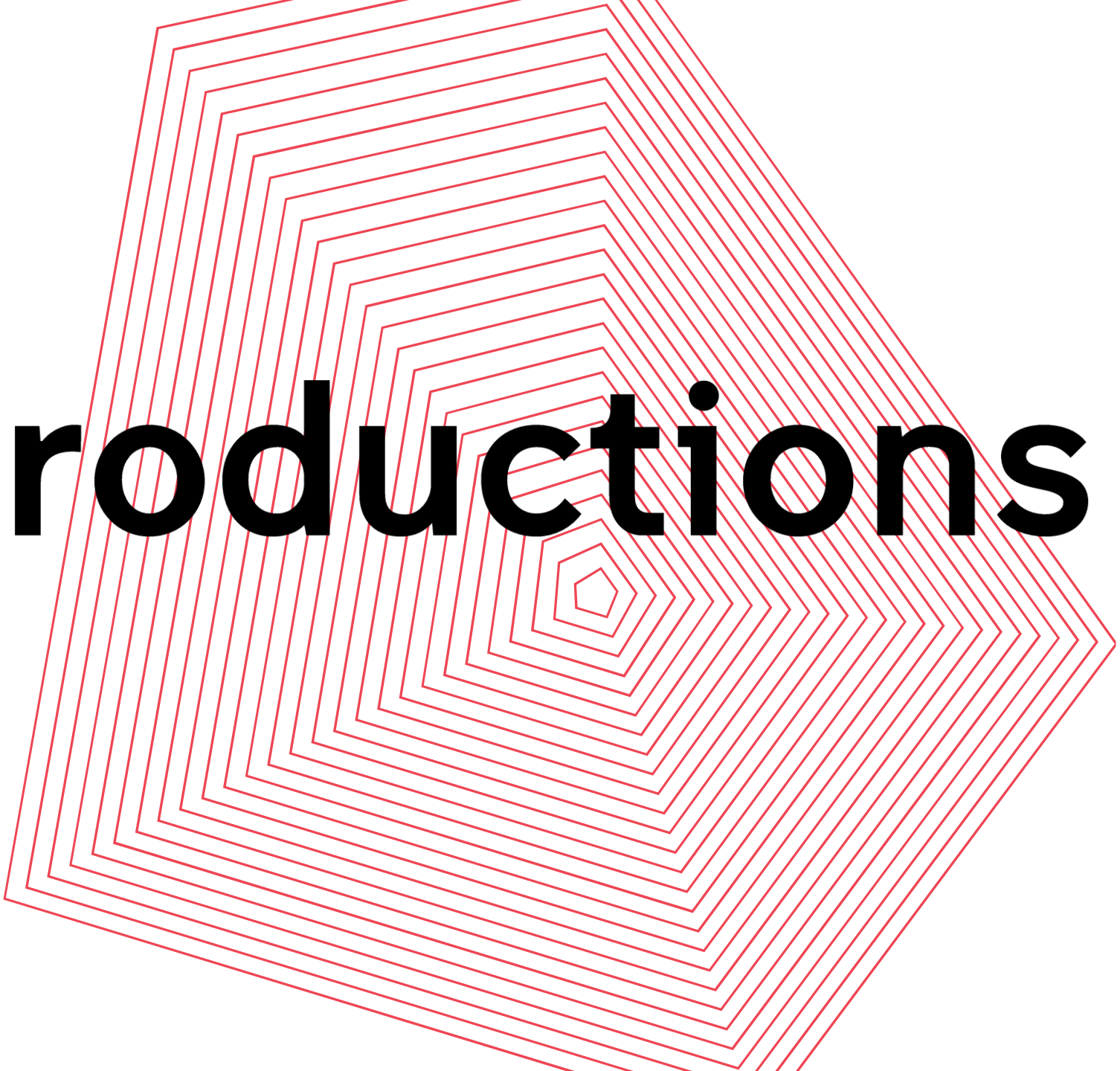

Introductions

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Coca-Cola

The most recognized brand in the soda world.

"*I'm one quarter Coca-Cola*," Warren Buffett told Fortune magazine. "*If I eat 2700 calories a day, a quarter of that is Coca-Cola. I drink at least five 12-ounce servings. I do it everyday.*"

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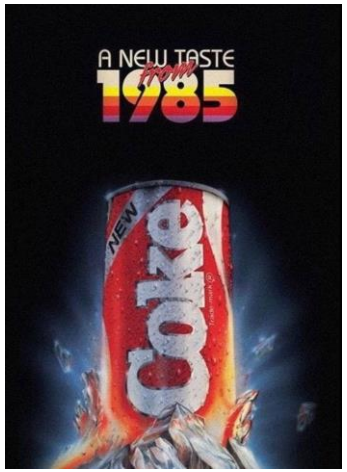
“New Coke”

- In 1985, Coca-Cola launched a new taste, the “New Coke”, which was sweeter and smoother.
- Taste tests in the market research were positive.
- However, the reactions of American people were negative, protesting against the loss of the original taste.
- 3 months after the launch, Coca-Cola changed the formular back to its classic taste.



- Market research spent $4 million and last for 2 years
- A loss of $30 million in back stocked products it couldn’t sell
- One of the most famous failed project in history.

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After this course, you will be able to look at projects through the lens of a project manager, learn fundamental principles of project management, which will guide you to achieve project goals.

What is a Project?

Some examples:

- Software development
- Hardware installation for an organisation
- Earth resources exploration and production
- Mergers and acquisitions of organisations
- Aircraft design
- Building construction
- Company restructuring
- Research and development for a technology
- …

PMBOK Guide (6th Ed) Part 1, Sec. 1.1.

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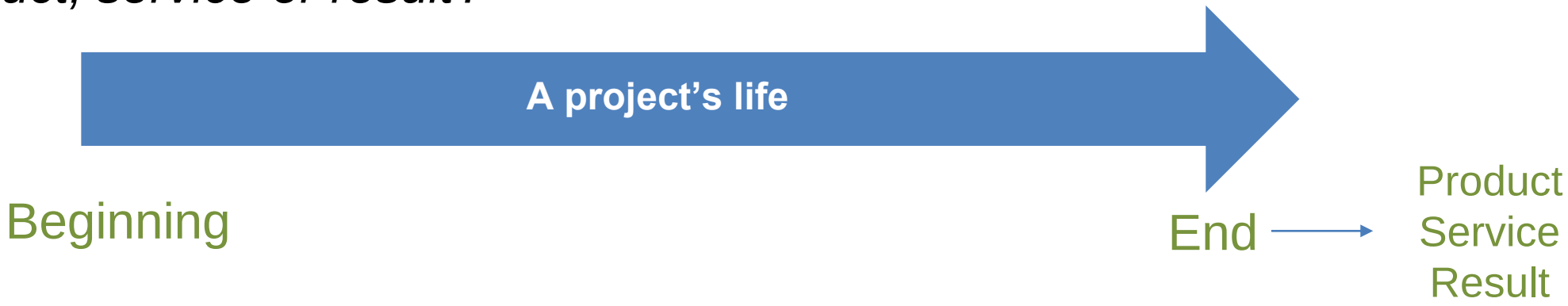
What is a Project?

A formal definition:
*'A project is a **temporary** endeavor undertaken to create a **unique** product, service or result'.*



- **Finite timespan**: A project has definite beginning and end. A project is ended when the project goals are met, or unable to continue (e.g. budget, resources etc)
- **Final deliverables**: Project goals/objectives are achieved by producing deliverables. A deliverable can a unique product, service, or result.

PMBOK Guide (6th Ed) Part 1, Sec. 1.1.

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What is a Project Management?

'Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements.'

Project management is to answer following questions:

- What problem are you solving?
- How are you going to solve the problem?
- What's your plan to get the project done?
- How will you know when you are done?
- How well did the project go?

Project manager

PMBOK Guide (6th Ed) Part 1, Sec. 1.1.

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What does a Project Manager do?

The project manager is the person assigned by the performing organisation to lead the team responsible for achieving the project objectives.

Project manager

A good project manger should have following skills but not limited to:

- Technical skills
- Management proficiencies (develop and manage scope, schedules, costs, quality, resources, risks)
- Interpersonal skills (establishing and maintaining active communication with stakeholders)

PMBOK Guide (6th Ed) Part 2, Sec. 1.7.

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Project life cycle

- The life cycle provides the basic framework for managing the project.
- All projects, regardless of the specific work involved, follow below life cycle structure:

Project phases

Starting the project	Organizing & preparing	Carrying out the work	End the project

- A project life cycle is **the series of phases** that a project passes through from its beginning to its completion.
- Phases are time bound, with a start and end or control point.

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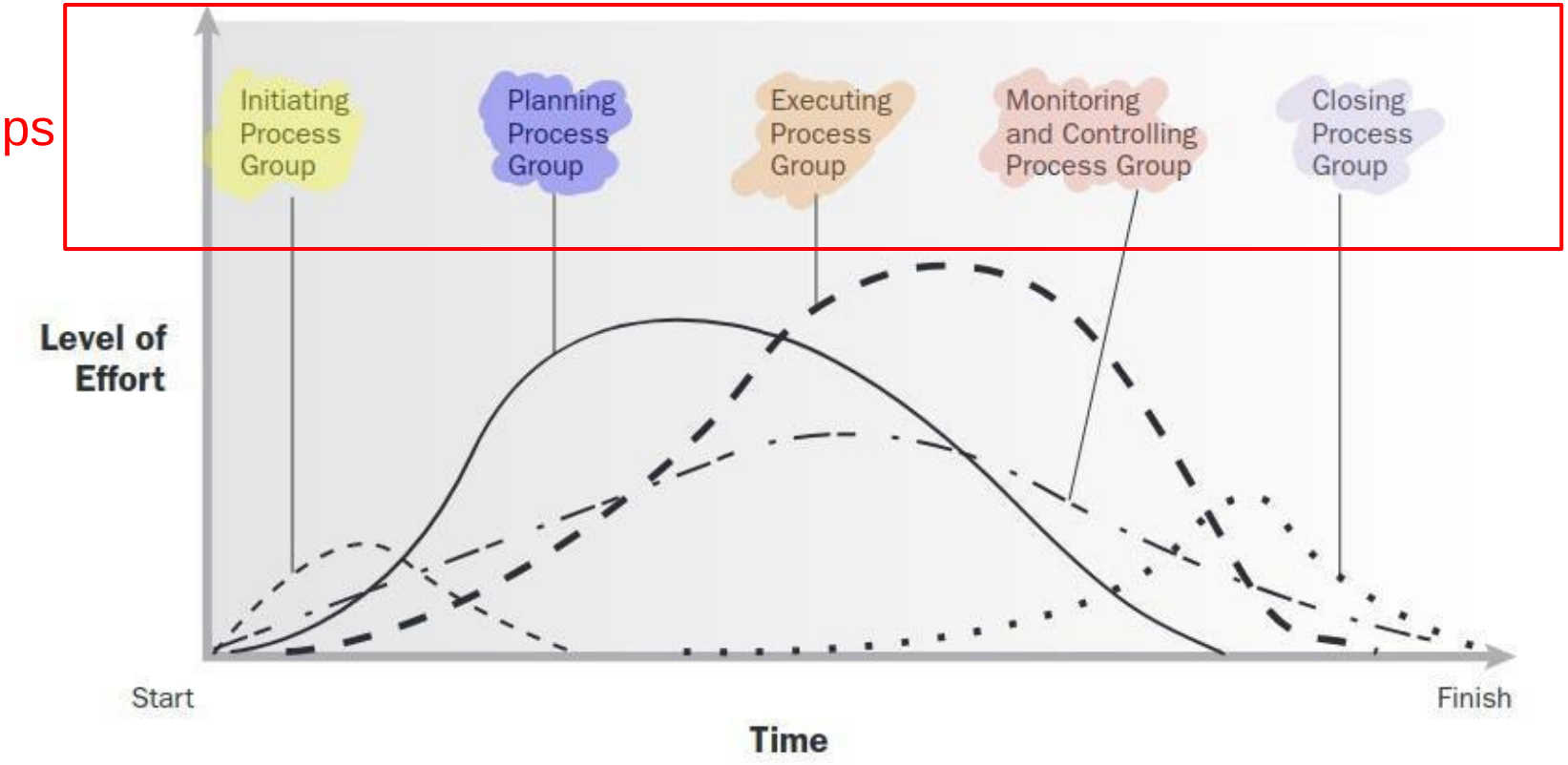
Project process groups

- At each project phase, there are processes to be employed to meet project objectives.
- They are grouped into 5 process groups:

Project phases ≠ Process groups

Process groups



Project phases

Starting the project	Organizing & Preparing	Carrying out the work	Ending the Project

PMBOK Guide (6th Ed) Part 2, Sec. 1.5 – 1.9 (Figure 1-5)

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Initiating | Weeks 1–3

- Deciding **what** you are going to do, showing **why** this is beneficial, get commitments of stakeholders, and obtaining **authorisation** to start the project.

- Key processes:
    - Identify **stakeholders**
    - Defining the **project scope**: problems, objectives, requirements, deliverables etc.
    - Develop the **project charter**
    - Assign a PM

PMBOK Guide (6th Ed) Part 2, Sec. 2.

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Planning | Weeks 1-6

- Deciding **how** you are going to achieve the objectives and **create the roadmap** that you will follow.

- Key processes:
  - **Work Breakdown Structure (WBS)**
  - **Schedule**: define activities, activity duration and scheduling
  - **Cost**: estimate cost and determine budget
  - **Quality**: set quality targets and measures
  - **Resource**: HR, procurement plan, activity resources
  - **Communication** : tools, frequency
  - **Risk** management: identify and analyse risks, solutions
  - Procurement plan
  - Develop the **Project Management Plan:** integrate components

PMBOK Guide (6th Ed) Part 2, Sec. 3.

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Executing | Outside the scope

- This is when you get to execute the project plan. You bring recourses on board, get people to perform the work, and manage the project.

- Key processes:
    - Develop and manage the team
    - Directing project work
    - Completing work planned in PMP
    - Coordinating resources
    - Managing stakeholders
    - Integrating activities (project manager's most critical job)
    - Conduct procurements

PMBOK Guide (6th Ed) Part 2, Sec. 4.

Monitor & Control | Weeks 7-8

- While the work is underway, you need to **track the progress, monitor and control the project**. If the project is out of track, work out the solutions.

- Key processes:
  - Gather data: starting date, duration, costs
  - Evaluate progress: compare against the plan, check objectives, schedule, cost, quality etc.
  - Readjust your plan
  - Request change: approve or reject the change
  - Perform integrated change: manage scope, schedule, cost, quality after the change
  - Report progress of the change
  - Monitor and control risks

PMBOK Guide (6th Ed) Part 2, Sec. 5.

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Closing | Week 9

- When the project is over, you should post-review the project, evaluate success, and celebrate achievements.

- Key processes:
  - Interpret success
  - Identify lessons learned
  - Measure stakeholder satisfaction
  - Finalise costs
  - Formally close out project activities
  - Give recognition for achievements

- PMBOK Guide (6th Ed) Part 1, Sec. 4.7.

Course overview

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Teaching Team

Course convener and lecturer
Dr. Yu Jing
Scientia Lecturer
School of Minerals and Energy Resources Engineering

Guest lecturer and demonstrator
Mr. Bernard Hayes
Former engineering executive of global infrastructure company
Casual lecturer at UNSW and UTS

Guest lecturer
Dr. Imrana Kabir
School of Mechanical and Manufacturing Engineering

Guest lecturer
Mr. Ibrahim Dani
PMO Manager at Seven Consulting

Guest lecturer
Dr. Habib Zughbi
School of Minerals and Energy Resources Engineering

Guest lecturer
Dr. Dennis Alonzo
Senior Lecturer
School of Education

Teaching Team

Head of demonstrators
Yingbo Sun
School of Mechanical and Manufacturing Engineering

Demonstrator and project sponsor
Junhan Jiang
School of Mechanical and Manufacturing Engineering

Demonstrator
Anish Anbalagan
School of Mechanical and Manufacturing Engineering

Demonstrator
Hasliza Omar
School of Mechanical and Manufacturing Engineering

Admin and demonstrator
Cindy Li
School of Mechanical and Manufacturing Engineering

Demonstrator
Dylan Sanusi-Goh
School of Computer Science and Engineering

Demonstrator
Archana Govindarajulu
School of Mechanical and Manufacturing Engineering

Project sponsor
Tong Ju
School of Mechanical and Manufacturing Engineering

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Assessments

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Project Management Plan	50%	Week 3, Week 7	1, 2, 3, 4
2. Individual Knowledge Examination	20%	Scheduled in exam time	1, 2, 3, 4
3. Team Quiz	10%	Week 8	1, 2, 3, 4
4. Interview	20%	Week 9, Week 10	4, 5

Course learning outcomes:

1. Translate from organisational strategy into project deliverables
2. Formulate project scope
3. Select and apply project management methods
4. Integrate and justify project plans
5. Evaluate progress and interpret success in projects

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Project Management Plan (PMP)

Task 1 - Scope Definition (Individual)

- 5%
- Due in Week 3
- Assess the Initiating process
- What to cover:
    - Define the purpose of your project.
    - Draw a work breakdown structure (WBS) diagram down to the work package level.
    - Write a scope statement for your project.

Project Management Plan (PMP)

Task 2.1 - PMP Components (Group)

- 40%
- Due in Week 7
- Group assignment
- Assess the Planning process
- What to cover: develop the Project Management Plan (PMP), while demonstrating the application of PM methods.

Project Management Plan (PMP)

Task 2.2 - Individual Progress Check Presentation (Individual)

- 5%
- Week 6
- In the week 6 meeting with your demonstrators, students are requested to show and summarise the work that they have completed for their PMP project.
- 1-min presentation.

Project Management Plan (PMP)

Task 3 - PMP Integration (assessed via interviews)

- 20%
- Week 9, 10
- Assess the Monitoring and Controlling process
- What to do:
  - Hand in PMP change (changes in budget, scope, assumptions and risks)
  - PMP Integration: Review and improve your PMP, with a particular focus on integration between the different parts.
- Updated PMP is not graded, but will be referred in the interviews scheduled in Week 10.

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Project 1 – Solar Farm

Duration: 2 years
Budget: $25,000,000
Scope: Optimise
Sponsor: Bernard

It is proposed for UNSW to engineer / procure and **construct a small commercially sized PV solar farm** on a 35-hectare site owned by UNSW in rural NSW. This facility will be connected to the Grid and will provide UNSW with renewable energy on a commercial basis. Additionally, it will be designed to allow further expansion and so permit novel solar PV panel/support designs to be added to test at the commercial-scale phase of their development. The vision of constructing this Developmental Solar Farm is to provide UNSW students the opportunity to study solar energy utilisation and facilitate research and development into advancing PV Solar Energy technology whilst providing UNSW with a renewable energy supply source.

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Project 2 – Transport

Duration: 4 years
Budget: $50,000,000
Scope: Optimise
Sponsor: Junhan

In this proposed scenario, Transport for New South Wales (TfNSW) is currently looking to procure the technology modernisation of its aging rollingstock fleets, aiming to **upgrade existing safety features and improve operational efficiency of the aging rollingstock**. As a part of this upgrade, a new condition monitoring system for the bogies is the key focus.
You are a project management team, which is contracted by TfNSW to produce a baseline project management plan (PMP). Your team is responsible to identify all potential stakeholders, project scope, risks, and opportunities. You shall also formulate a budget and schedule, and consider all stages of the project (i.e., design, test and procurement). The proposed PMP must set realistic targets on technical outcomes and HR management strategies.

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Project 3 – Learning and Growing Platform

Duration: 6 months
Budget: $200,000
Scope: Optimise
Sponsor: Tong

The COVID-19 pandemic has disrupted the way student communities interact, especially at UNSW where the community comes from all around the world. In 2022, hybrid remote and study working styles are emerging strong with an increase in convenience and flexibility for many. Many staff and students continue to engage with the university remotely, but this comes with a trade-off where students have limited opportunities to connect with their peers or engage with industry. UNSW is looking for you to **develop a responsive website and mobile app to connect UNSW students** across the 3 campuses and 6 faculties. The platform must address the above problem and provide benefits to students across all 3 campuses (Kensington, Paddington, and Canberra) and 6 faculties.

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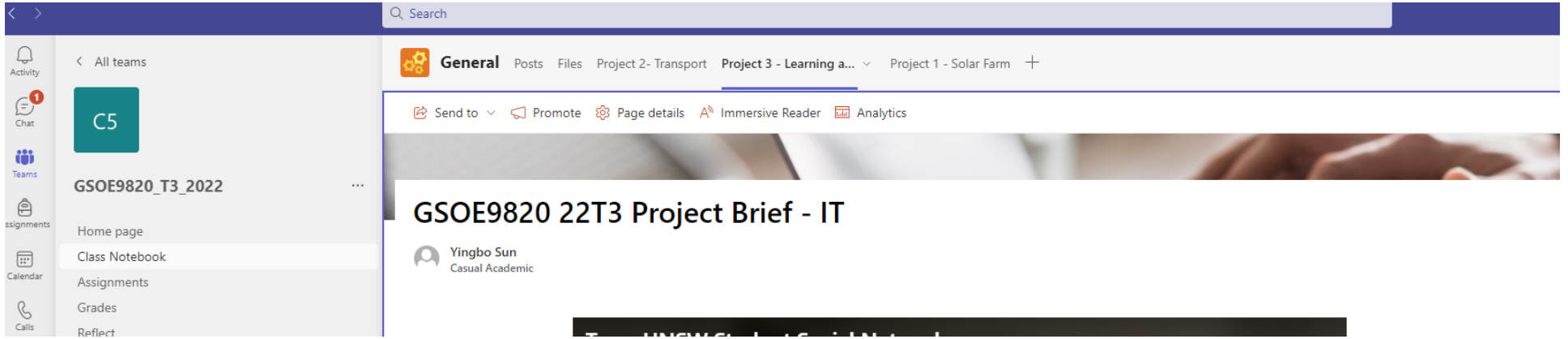
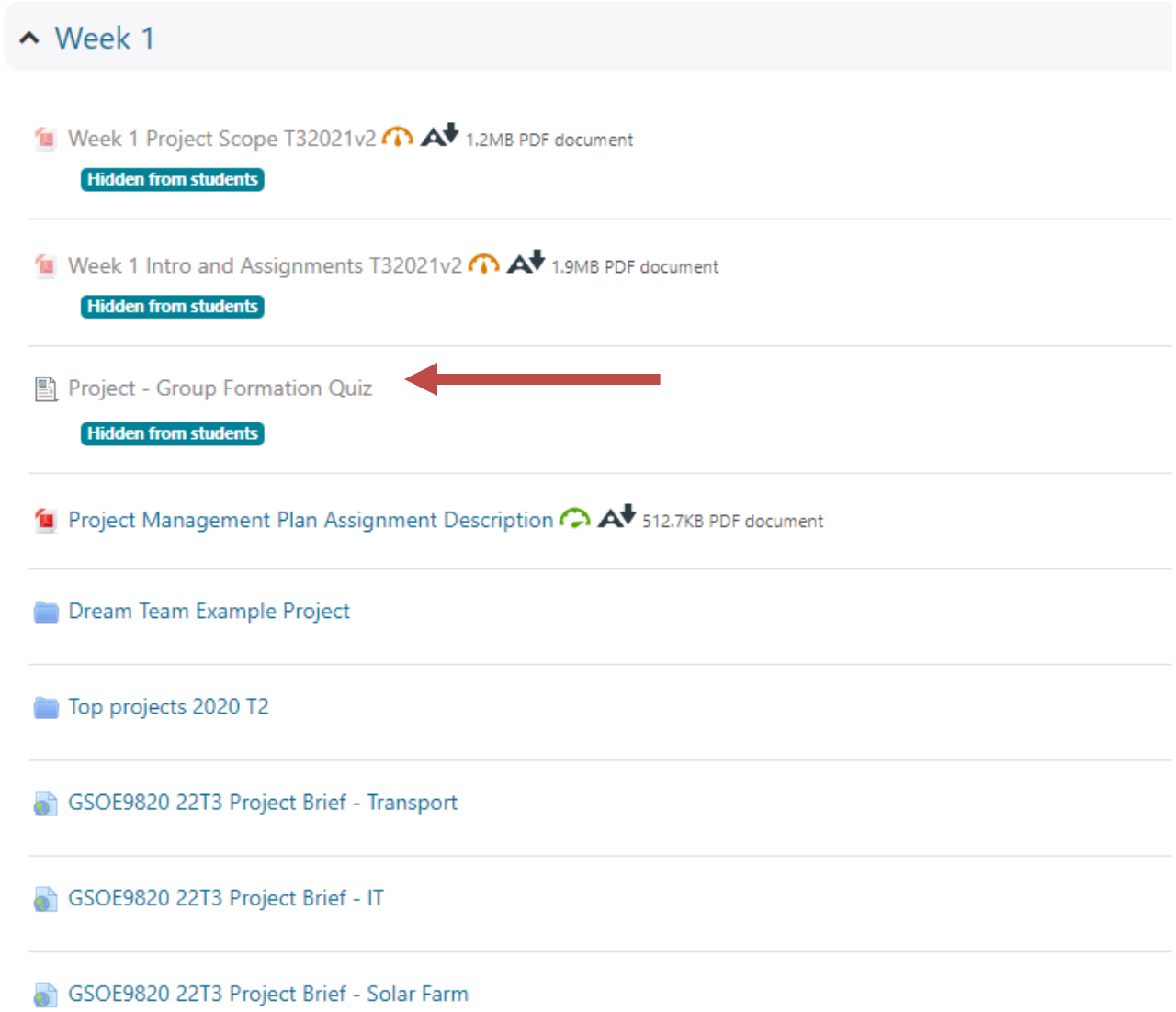
Project briefs can be found on Moodle and Teams



Select project topic on Moodle

- Select project topic
- Find your teammates (5-6)
- Due: Week 1 5pm Sunday
- Weekly check-in meetings with your demonstrator from Week 2



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Activities

Lectures

- Weekly, from Week 1
- Thursdays 6pm – 9pm
- 2-3 hours

Demo meetings

- Weekly, from Week 2
- Time is determined by demonstrators
- ~12 min/group

Team based learning (TBL)

- Project management plan (PMP2)
- Case study
- Group online quiz

Individual activities

- Project management plan (PMP1)
- Online quiz
- Interview
- Final exam

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Communication and Teamwork

- Large class, ~300 students
- Communication tools: MS Teams, check it regularly
- Forum channels on Teams for questions (general and project-related). In Week 6, project sponsors will response to the project-related questions.
- Teamwork is essential for this course:
  - Set shared goals
  - Make a plan
  - Agree on tools
  - Allow different roles
  - Picture success, and include a part for everyone
- Lots of peer review and feedback opportunities.

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	Topics	Tasks	**Assignment hand-ins**
Week 1	Introduction Scope, Project Charter, WBS	Select project topic on Moodle	
Week 2	Design Thinking		
Week 3	Stakeholders	Moodle practice quiz	**PMP Task 1 (5%)**
Week 4	Theory of change and programme logic model		
Week 5	Scheduling, risk management, estimating and budget		
Week 6	PMP Q&A	**Progress check presentation (5%)**	
Week 7	Project Controls	Moodle practice quiz	**PMP Task 2 (40%)**
Week 8	Project Controls Application exercise (TBL)	**Case study quiz (10%)**	
Week 9	Successful stories of project management	Interview Preparation	PMP Task 3
Week 10		Moodle quiz **Interviews (20%)**	