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# Design and Professional Practice 2

## Project Planning

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## Aims and Objectives

The aim of this session is to provide you with a basic understanding of what is required to manage a design and development project.
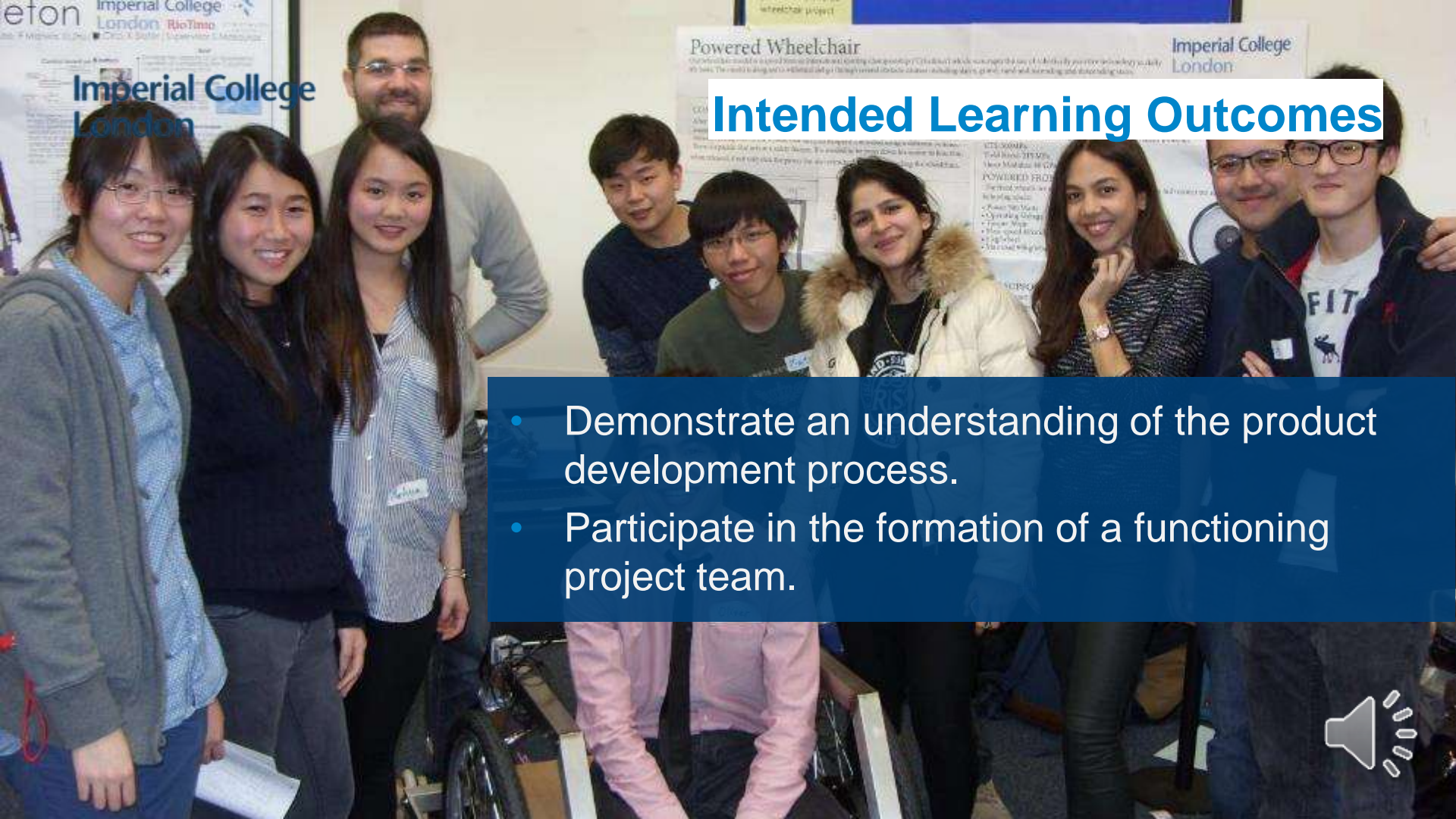
# Intended Learning Outcomes

- Demonstrate an understanding of the product development process.

- Participate in the formation of a functioning project team.

**Product Development Process**

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1
Problem
Definition

2
Concept
Generation

3
Technical
Development

4
Detail Design

5
Manufacture
Realisation

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## Conception & Initiation

Identifying if the project is feasible and beneficial.

(You shouldn't need to worry about this phase)

## Definition & Planning

Writing of a project plan.

- Priorities
- Deliverables
- Budget
- Schedule

## Implementation & Execution

Distribution of tasks and resources. Communication of information is vital at this point.

## Performance & Control

Evaluation of progress against the project plan.

- Schedule revision
- Budget control

## Close & Evaluation

Completion of the project and evaluation of performance to inform future.

1
Problem Definition

2
Concept Generation

3
Technical Development

4
Detail Design

5
Manufacture Realisation

- Is the project of benefit to the company?
- Is the project technically feasible?
- Can the project realistically be completed?

Definition & Planning

Discuss project all the stakeholders

**Definition & Planning**

Identify key objectives & deliverables

Discuss project all the stakeholders

SMART Objectives
- Specific
- Measurable
- Achievable
- Realistic
- Time-bound

**Definition & Planning**

Identify key objectives & deliverables

Discuss project all the stakeholders

- Each objective has a clear outcome
- The outcome is a deliverable
  - A change is achieved
  - Something is produced
- A deliverable is something demonstrable

**Definition & Planning**

Discuss project all the stakeholders

Identify key objectives & deliverables

List of separate tasks / activities.

# Definition & Planning

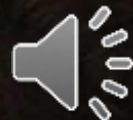Discuss project all the stakeholders → Identify key objectives & deliverables → List of separate tasks / activities. → Estimate task durations

- Estimate how long each task will take
  - The size of the task
  - The available working time
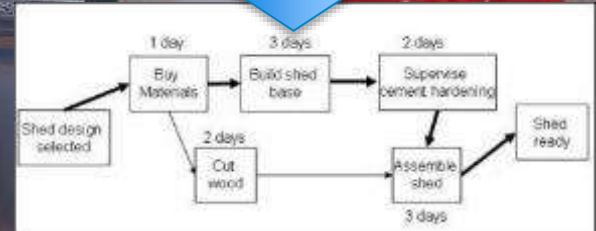  - Historical data from other projects

**Definition & Planning**

Discuss project all the stakeholders → Identify key objectives & deliverables → List of separate tasks / activities. → Estimate task durations → Prepare the sequence of events
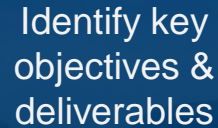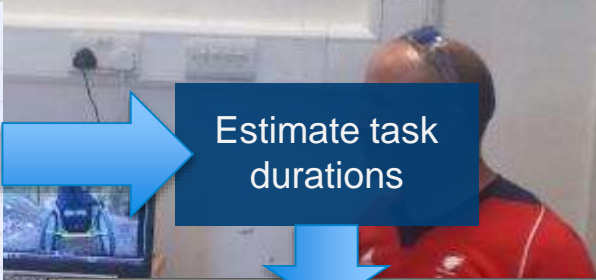
Identify key objectives & deliverables

Estimate task durations

Prepare the sequence of events

Structure team and designate responsibilities
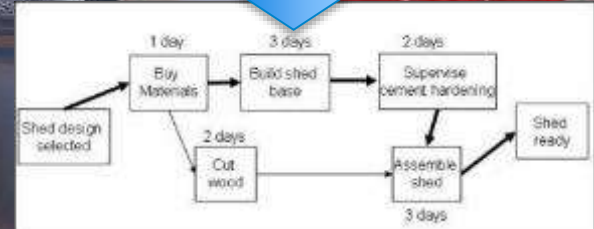
- Project Manager
  - Point of contact for communications
  - General organiser and delegator
- Procurement Manager
  - Responsible for purchasing
  - Interaction with Bioeng-orders
- Manufacturing Manager
  - Responsible for overseeing manufacture
  - Interaction with Technicians

# **Definition & Planning**

Discuss project all the stakeholders

Identify key objectives & deliverables

List of separate tasks / activities.

Estimate task durations

Prepare the sequence of events

Prepare a Gantt chart with cost estimates

Structure team and designate responsibilities
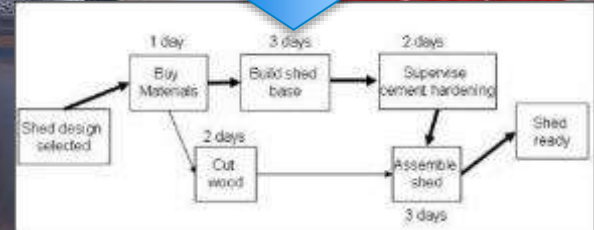
# Definition & Planning

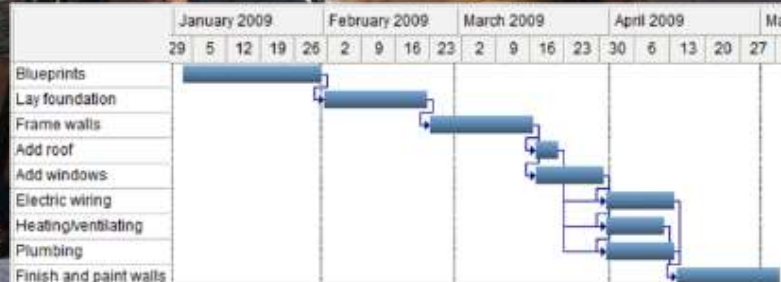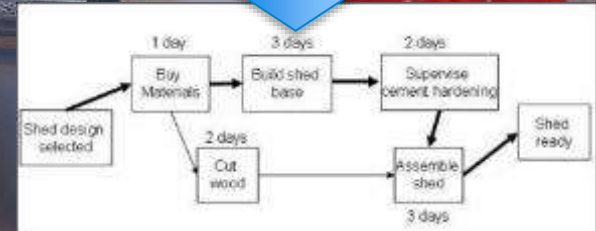Discuss project all the stakeholders

Identify key objectives & deliverables
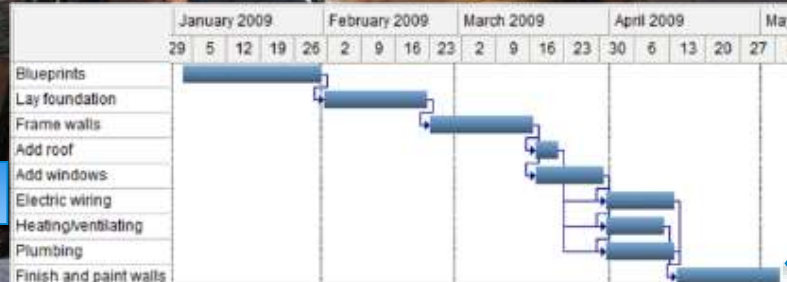
List of separate tasks / activities.

Estimate task durations

Prepare the sequence of events

Include a contingency

Prepare a Gantt chart with cost estimates
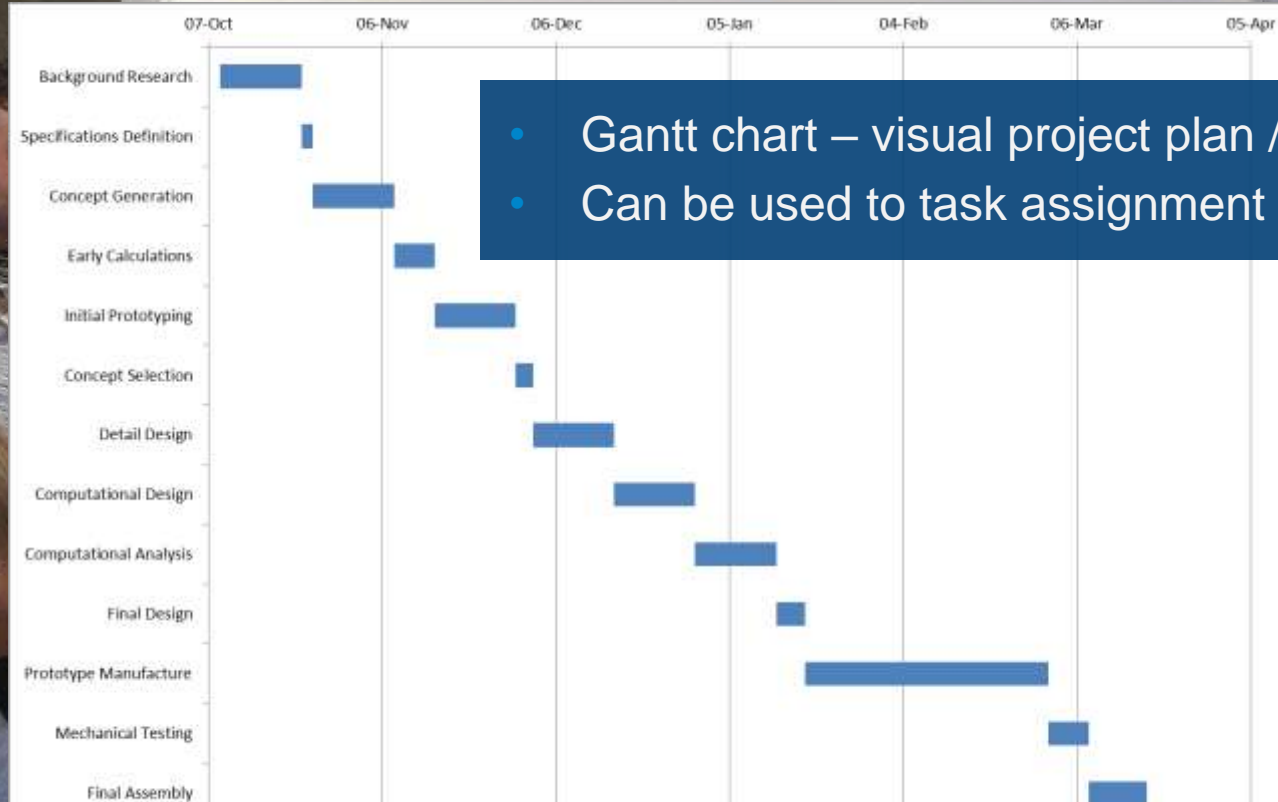
Structure team and designate responsibilities

# Definition & Planning

- Gantt chart – visual project plan / timetable
- Can be used to task assignment

This is just a guide and not all the dates and times are applicable
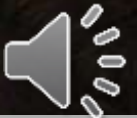
# Definition & Planning

- Add in key events
  - Deadlines (milestones)
  - Holidays

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# Definition & Planning

- Critical path
  - Which tasks are dependant on one another
  - Shown in green in this simple model

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# Definition & Planning

- Critical path
    - Which tasks are dependant on one another
    - Shown in green in this simple model
    - Some tasks can be performed in parallel
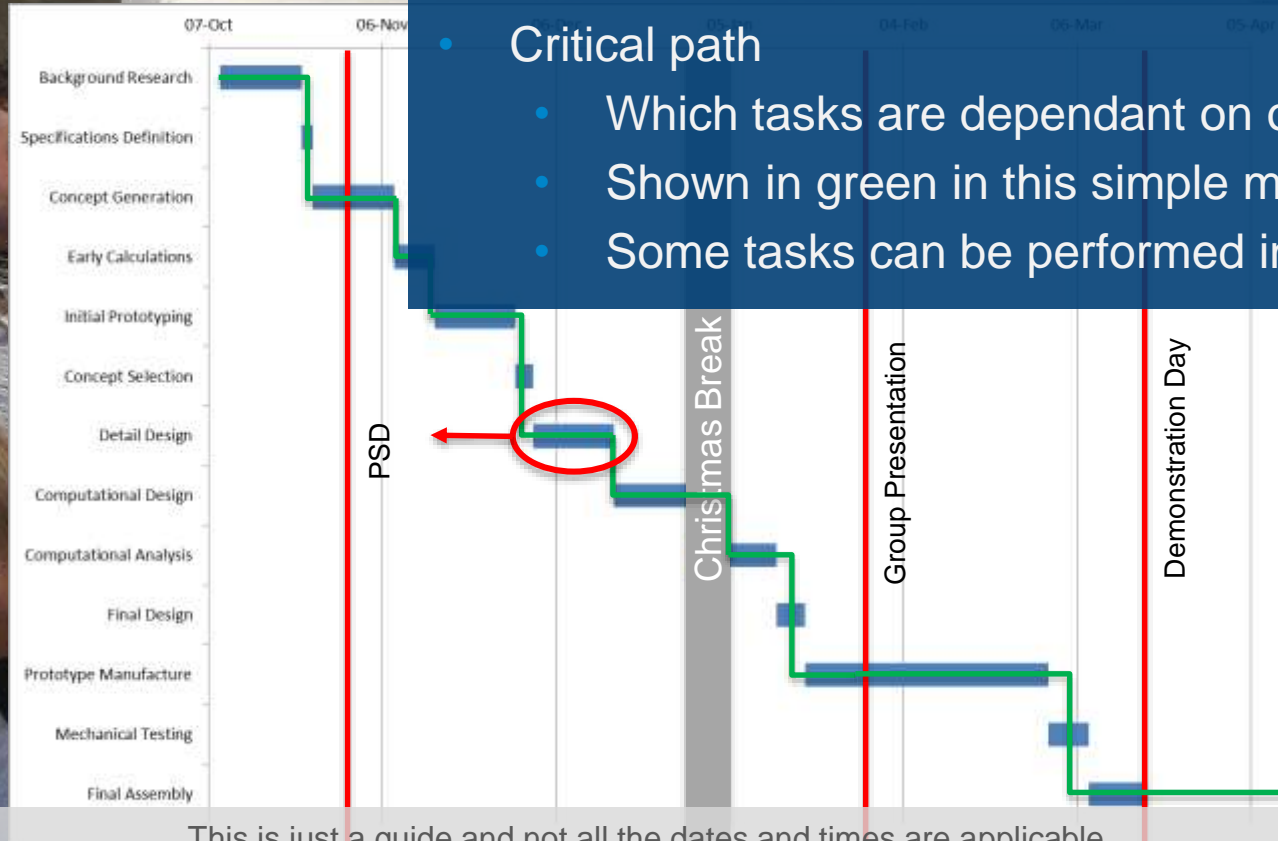
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# Definition & Planning
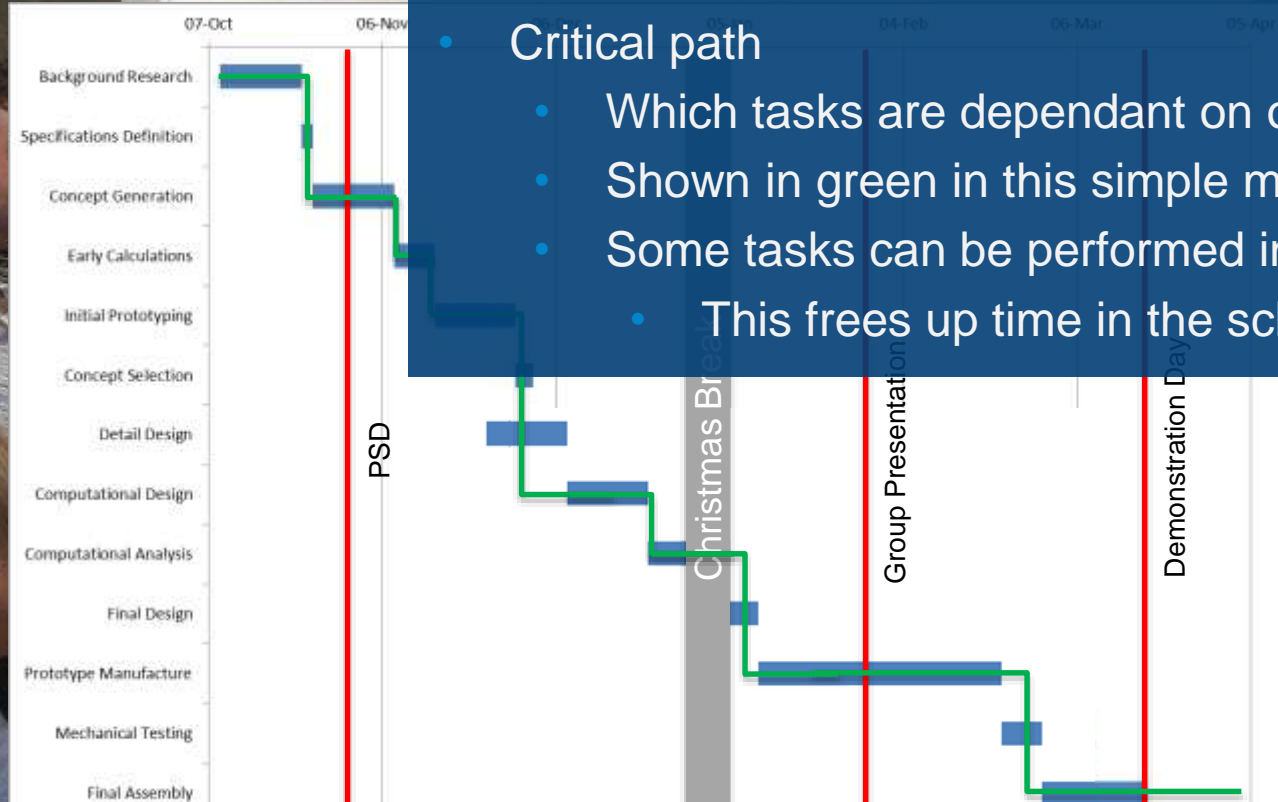
- Critical path
    - Which tasks are dependant on one another
    - Shown in green in this simple model
    - Some tasks can be performed in parallel
        - This frees up time in the schedule

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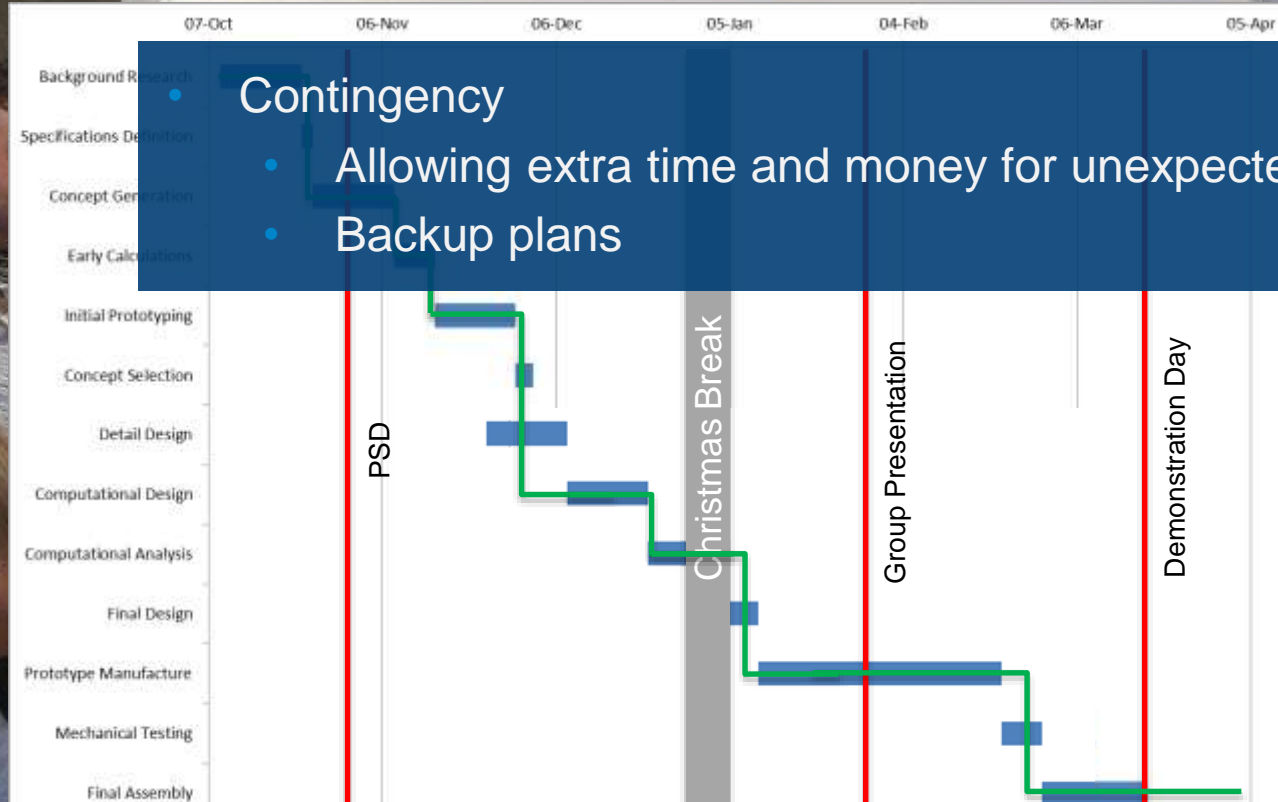
- Contingency
  - Allowing extra time and money for unexpected issues
  - Backup plans

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# Definition & Planning

- Contingency
  - Allowing extra time and money for unexpected issues
  - Backup plans
  - Can be created by adding extra time onto tasks
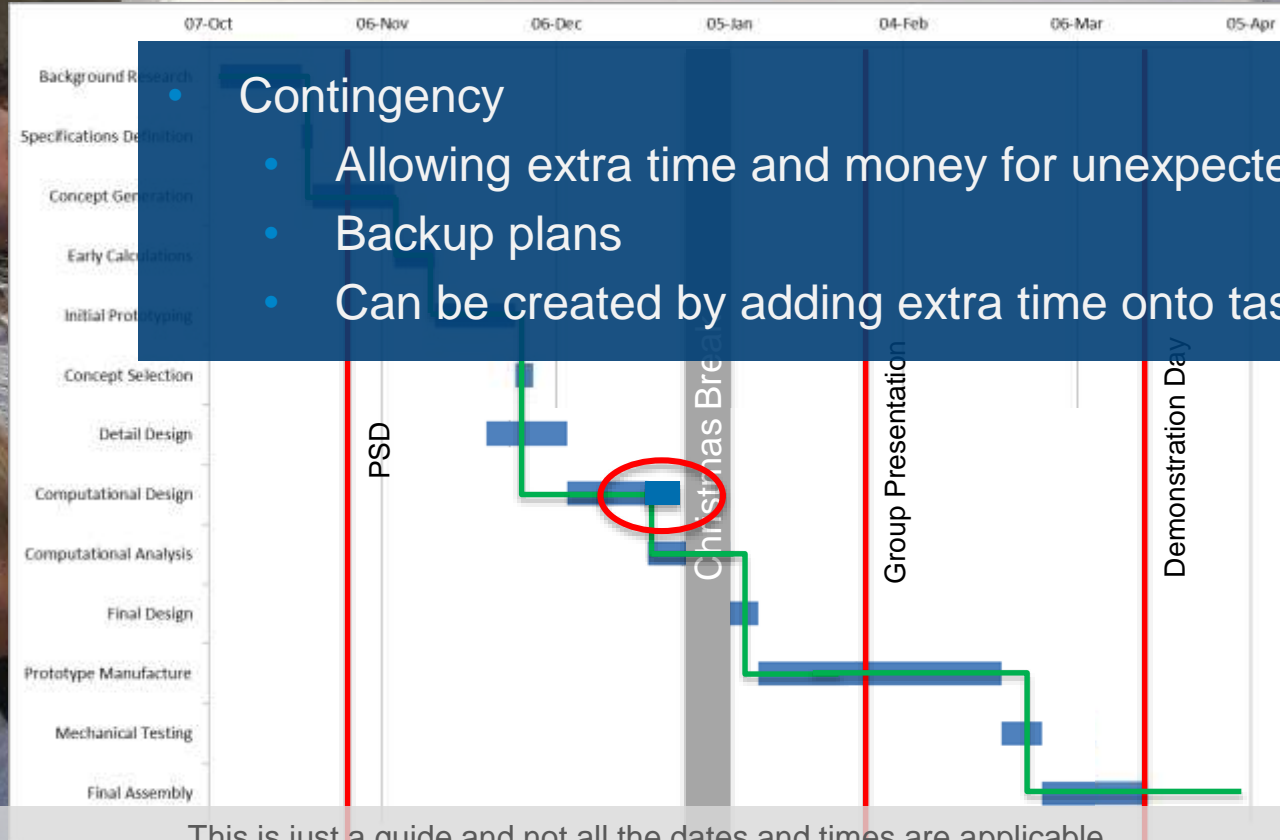
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- Contingency
  - Allowing extra time and money for unexpected issues
  - Backup plans
  - Can be created by adding extra time onto tasks
  - Can add in a contingency period

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# Implementation & Execution
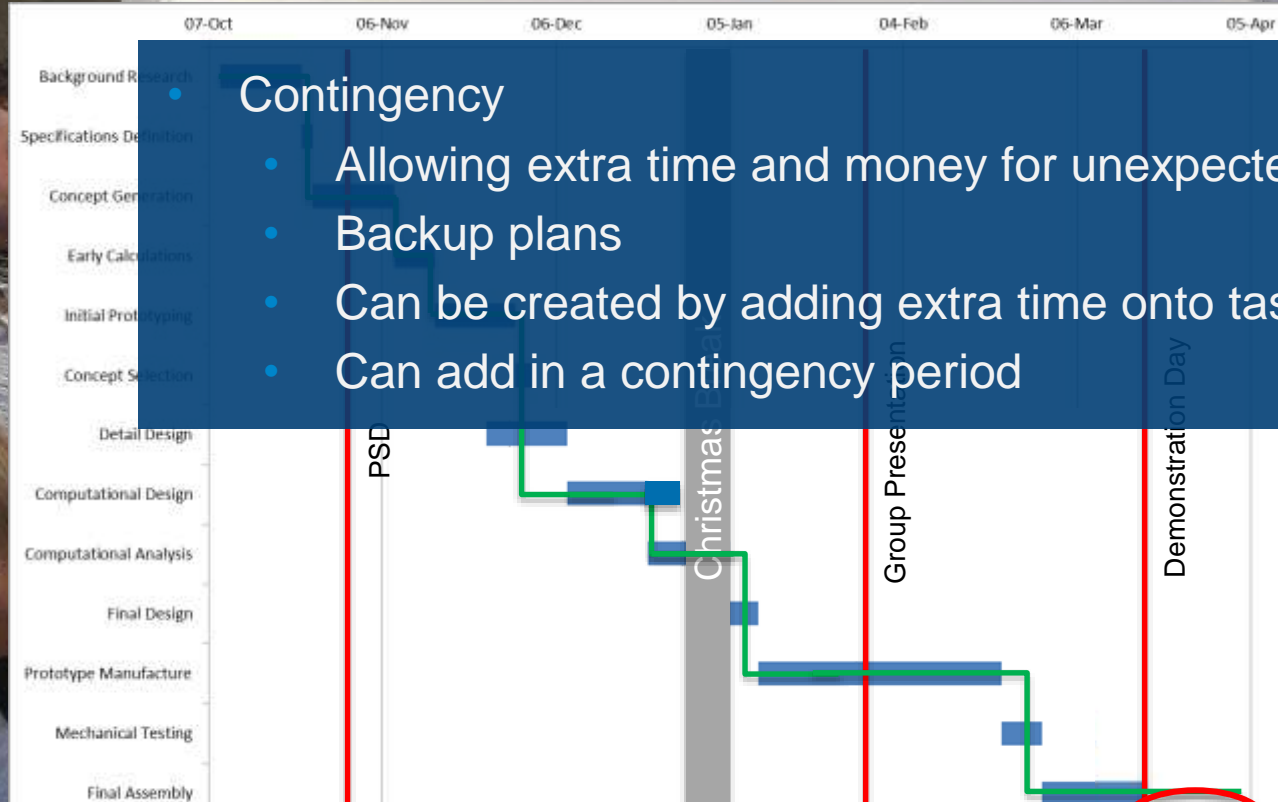
Teamwork

- Tasks and responsibilities are distributed among the team
    - Everyone has a role to play (ownership)
    - Everyone needs to do their share
- Work in sub-groups
    - Do not let a task rely on any one individual



Peer assessment

Communication

- Information Control
  - Document Management Systems
    - Version Control
    - Document Release Number (1,2,3, A, A1 etc.)
    - CAD Vault
    - GitHub
  - Track Changes
    - Google docs
    - Track changes in MS Word

- Have regular meetings
- Keep records of important decisions (meeting notes)
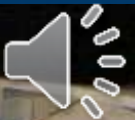- Share information

# Performance & Control

- Control of progress
  - Monitor tasks and activities against the plan
  - Ensure objectives are met
  - Keeping within timescales
  - Keeping with budget (spreadsheet)
  - Keeping quality
- Regular reviews to evaluate and revise

Time

Quality

Cost
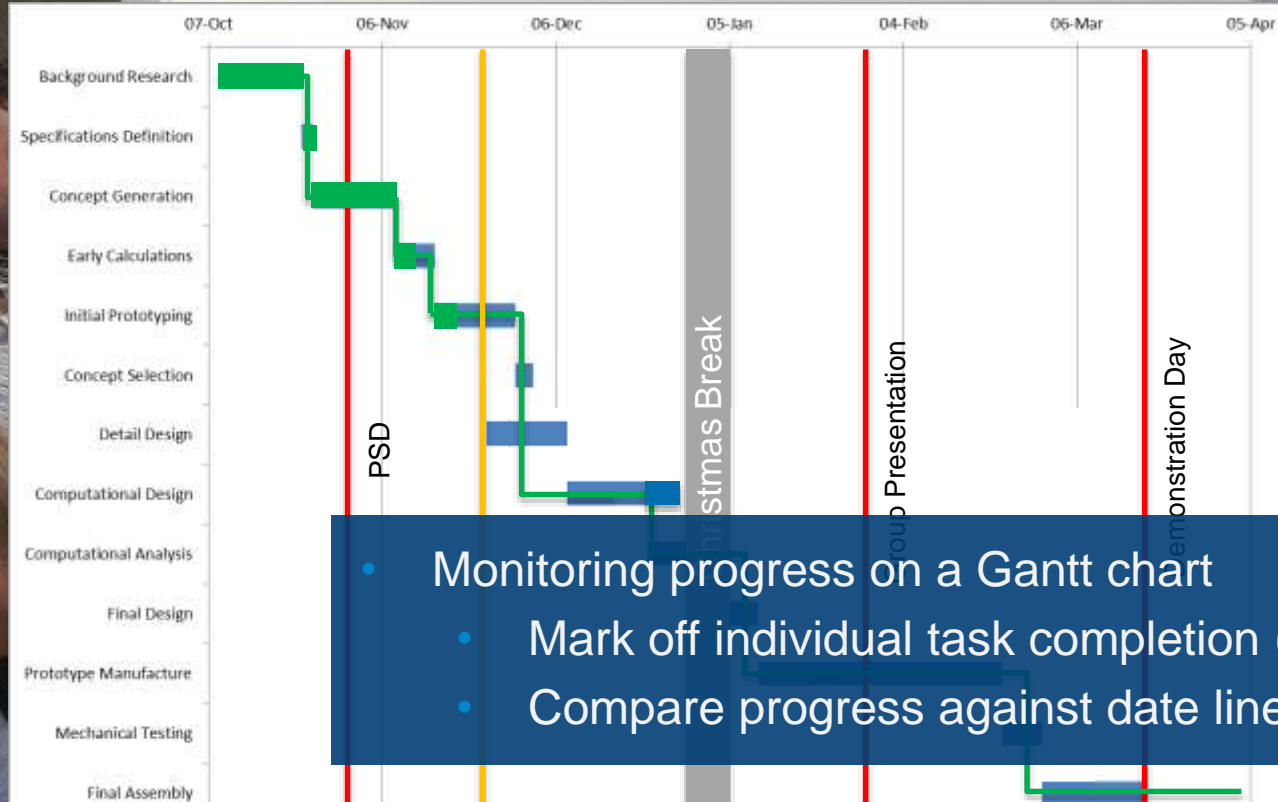
- Monitoring progress on a Gantt chart
  - Mark off individual task completion (green)
  - Compare progress against date line (orange)

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Project Delivery

- Functioning prototype
- Collated files (stored on Box)
  - Report
  - Images
  - Designs and drawings
  - CAD files
  - Code
- Box-up components etc.

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Project Delivery

- On completion
  - Are all outstanding tasks complete?
  - All project activities are discontinued?
  - All resources are accounted for?
    - Tools returned
    - Books returned
    - Expenses claimed for

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Project Delivery

- Review
  - What lessons can be learned for the future?
    - Successes
    - Failures
  - What could be improved?
  - Proposals for future developments

**In Summary**

- Define the outcomes required.
- Consider the resources that you have and those that you will need to find.
- Consider, how will you know when you have done it well enough?
- Divide the tasks among the team and
- Set the deadlines for the sub-tasks and times for future meetings.

**Further Reading**

https://www.pmi.org/learning/library/empowering-kids-through-project-skills-7220

https://www.projectmanager.com/project-planning

https://www.teamgantt.com/guide-to-project-management/how-to-plan-a-project

https://www.prince2.com/uk/how-plan-project