Introduction to Projects, Project Reports, and Gantt Charts
Design Projects Fit Into 4 Categories

**Physical principles modeled by statistical data.**
- Catapult Design
- Designing to Control Catapult Variability

**Physical principles modeled analytically with equations.**
- Water wheel Design
- Tractor Design

**Physical principles modeled with computer simulations, graphs, etc.**
- Solar Oven Design
- Wind Turbine Driven Electric Generator Design

**Design of an education/career plan sufficient to support initiation into the engineering profession.**
Design Process

1. Accept Need
2. Define problem
3. Search
4. Criteria & Constraints
5. Alternative Solutions
6. Analysis
7. Decision & Explication
8. Plan
9. Implement
10. Evaluate

Problem Formulation
Problem Solving
Solution Implementation
### Ganttt Chart for a Freshman Design Project

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Getting Started

◆ Team members must agree on:
  – where and when the team will meet,
  – the resources that will be needed, and
  – how resources will be obtained.

◆ Each activity listed should have someone responsible for it.
Team Member Assignments

- Remind the team of how its progress correlates with the schedule planned in the team’s Gantt Chart, and negotiate schedule changes when it appears deadlines may not be met.
- Contact those who miss meetings without notice.
- Keep a record of important results and assignments accepted by the members.
- Determine how team leadership will be handled: rotated among team members, a permanent assignment to a team member, or shared by the members as a group.
Progress Reports (responsibilities)

The person(s) giving the report is responsible for:

- Honest and accurate information.
- Supporting substantive findings with data.

During the progress report the reviewers are responsible for:

- Constructive feedback to maintain the right focus and direction.
- Removal of any barriers that prevent the team from achieving goals.
- Education and coaching to share knowledge and experience.
- Necessary resources for the team to carry out its activities.
- Resolution of issues that threaten the successful completion of the team's goals.
- Recognition of the team's progress.
Progress Reports (first foil)

Highlights
- *Statements of what went well over the last period.*
- *Key findings and results.*
- *Impacts of the results.*

Lowlights
- *Statements of what didn't go well over the last period.*
- *Changes that need to be made in the team’s approach.*

Issues
- *Barriers the team needs to remove.*
- *Problems that are beyond the team's scope or authority.*

Plans
- *Areas that will receive focus during the next period.*
- *Identification of how lowlights and issues will be resolved.*
- *Recommendations for future actions.*
- *New ideas.*
Example
Progress Reports (first foil)

Highlights
◆ The three factors and two levels have been determined.
◆ The standard deviation for sets of data have ranged from 0.33 to as low as 0.12.
◆ We have determined the optimum level settings.

Lowlights
◆ We cannot find enough common times to meet.
◆ We did not construct a project Gant Chart.

Issues
◆ There is some friction in the catapult we have.
◆ Bill Smith is listed as a team member, but has never come to class.

Plans
◆ Gant Chart for remainder.
◆ Seek help in removing friction.
◆ Find Bill if still in the course.
◆ Attempt an experiment where the number of rubber bands is a factor.
Progress Report (second foil)

Indicators/Schedule

◆ *A graphic indication of the situation as it currently exists.*

◆ *If possible, show key indicator(s) of performance (typically graphic representations).*

◆ *In the absence of indicators, a Gantt chart reviewing performance against schedule is the default.*

◆ *If absolutely necessary, additional graphics and text may be included for added analysis and explanation of the situation.*
Contents of written technical reports

1. Title Page - This contains the report’s title along with names of all authors, the date and the organization they represent.

2. Executive Summary - This section of a technical report should be able to stand alone. By reading it people will attempt to determine the main points of the report and then move on to the results and conclusions. The executive summary should be no more than one page long and is usually written last.
3. Introduction - *This describes the need being filled or the motivation for the work done. It includes specifications and criteria by which the work being reported should be judged, the scope of the design or research project, and the rationale for choosing the design or experimental variables that are used.*

4. Main body - *This describes what was done. It may be several pages in length as needed to sufficiently cover all necessary information, and it can be broken into subsections as appropriate for the content of the report. Sometimes referred to as ‘methods and procedures,’ in this section alternative solutions are described, analyzed and compared. Charts or graphs used in making the final design decisions are included along with experimental results and the procedures used in implementing and testing the design.*
5. Results and conclusions - *This section presents a brief description of the important results that were accomplished by project activities. When readers finish reading this section they must have received the report’s intended message and be motivated to act on it.*

6. Discussion and recommendations - *This section presents the consequences of the work that is reported. The author may recommend directions for future work to improve the performance or some other aspect of the design.*

7. Appendix - *If necessary.*
Problem formulation
• accept need
• define problem
• search
• criteria and constraints

Problem solving
• alternative solutions
• analysis
• decision and explication
• present design review

Solution implementation
• plan
• implement, evaluate
• write report
• submit final report

Norm State of Team Member Influence

Below average influence
Average influence
Above average influence

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Table: Norm State of Team Member Influence