Modulation Using MATLAB

(Project Management Plan)

Communication Theory and Systems (CIE 337)

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Project Objectives

- **Understand Modulation Techniques**
- **Message Generation**
- **Signal Analysis**
- **Documentation**

Scope

- **Generation of message signals.**
- **Implementation of DSB-QAM modulation and demodulation.**
- **Angle modulation with varying parameters.**
- **Reporting of findings and results.**

Milestones

- **Generation of message signals.**
- **Implement DSB-QAM modulation and plot results.**
- **Develop the QAM receiver and perform signal extraction.**
- **Analyze errors in receiver's carrier signal.**
- **Implement angle modulation and analyze results.**
- **Finalize documentation and prepare the report.**
- **Prepare the Project management plan.**

Deliverables

- **Source codes (.m files) to generate the required signals.**
- **Figure plots (.fig files) of the required signals.**
- **A .pdf file of a complete report, including the figures, properly labeled and titled.**
- **A .pdf file of a complete report, including project management plan.**

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Work Breakdown Structure (WBS)

Project Planning

- Define objectives and scope.
- Create project schedule.

Signal Generation

- Develop m1(t) and m2(t).
- Plot and save figures.

DSB-QAM Modulation

- Implement modulation code.
- Generate and plot modulated signal.

QAM Receiver Implementation

- Extract m1(t) and m2(t).
- Analyze phase variations in receivers.

Angle Modulation

- Implement angle modulation for m1(t) and m2(t).
- Plot results for different Kp and Kf.

Documentation

- Compile code and figures.
- Write the final report.

Scheduling Tasks

We have spent a total of 4 and half hours working on this project over the past week during online meetings.

Task	Duration	Dependencies
Project Planning	30 mins	none
Message generation	30 mins	none
DSB-QAM Modulation	1 hours	Message generation
QAM Receiver Implementation	30 mins	Message generation and DSB-QAM Modulation
Angle Modulation	30 mins	Message generation
Making report for results	1 hour	All previous tasks
Making project management report	30 mins	All previous tasks

Risks and Mitigation plans

Risk	Mitigation plan
Problem in low pass filter MATLAB function	We attempted to determine the optimal cutoff frequency to achieve the best results.
Data loss or corruption	Regular backups of code and documents.
Errors in modulation and receiver	We verified that the graphs and mathematical calculations are correct by conducting a hand analysis.
Spending too much time in coding	We searched for MATLAB functions that make coding easier.

Project Management tools

We used Agile methodology in our project by breaking the work into phases and focusing on continuous delivery and improvement. Throughout the duration of the project, we maintained thorough documentation and held regular online meetings to ensure that everyone stayed aligned and informed.