

# COE 485: Senior Design Project (141)

## Final Report — Template

### 1 Introduction

- Introduce the general issue with which the project deals, e.g. rising cost of health care, environment, ... etc.
- Why is it an issue? supporting evidence; government statistics, news, magazine, or journal articles, etc.
- Briefly describe how the project deals with the issue.

### 2 Problem Statement

- The specific problem the project is supposed to solve.
- Why was the project conducted? why do we need it?
- Project Impact: potential impact of the project on society *locally* and *globally*:
  - Positive impact.
  - Possible negative impact, due to misuse or unaccounted for risks.

### 3 Project Specifications

- Customer/User requirements, functional and non-functional.
- Technical specifications:
  - Derived from and maps to customer requirements.
  - Must be specific and testable. The product must meet all specifications.
  - Examples: speed: 5 m/s, response time: 10 ms, range: 2 m, accuracy: 5% error.

### 4 System Design

Completely document the project design. Use graphical illustrations as much as you can.

#### 4.1 Architecture

- Sub-function identification.
- System architecture and components.
- Hardware vs. software components.
- Functions of each component.

#### 4.2 Component Design and Implementation

- Off-the-shelf hardware and software components.
- Custom hardware and software components, and justification for developing custom components.
- Design and implementation of each component, e.g. flow chart, pseudocode.

#### 4.3 System Integration

- Interfaces between components (hardware and software).
- Component interaction and related interfaces.

#### 4.4 Design Decisions

- Examined design options at both levels: system and components.
- Criteria for choosing the adopted design options.
- Tradeoffs.

#### 4.5 Design Evolution

How and why the system evolved from the initial design to the final design.

#### 5 Testing, Analysis, and Evaluation

- Testing methodology and results: how did you determine whether the system is operational and meets all requirements and specifications.
- Debugging: how did you find sources of errors.
- System *analysis* and *evaluation*: performance, efficiency, reliability, security – as applicable (use graphs).

#### 6 Engineering Tools and Standards

- Relevant available tools, and for what purpose, e.g. simulators, emulators, boards, development environments, IDEs, debuggers, software frameworks... etc.
- Used tools: which of the available tools are chosen, and why.
- Relevant standards, and for what purpose, e.g. communication protocols, storage formats, component interfaces, specification languages... etc.
- Used standards: which of the relevant standards are used, and why.

#### 7 Issues

- Problems, faults, bugs, challenges. For each issue, list:
  - The issue.
  - Attempted, unsuccessful resolutions.
  - Final resolution: solution, workaround, issue ignored.
- Limitations and constraints of the design.
- Limitations and constraints of the implementation.

#### 8 Teamwork

For each team member, list:

- Responsibilities: tasks managed by the team member.
- Contributions: tasks contributed to by the team member.
- Expertise: areas in which the team member is knowledgeable and often consulted.

#### 9 Conclusion

- What was learned.
- What would you do differently in a similar project?
- Conclusions.