Rubrics for Computer Engineering Undergraduate Capstone Design Project Evaluation (CMPE 406)

I. Report

Score / Criterion	4	3	2	1
Organization and format (whole report)	Report follows the format specified for CMPE projects exactly	Report leaves out 1-2 chapters of the format	Report leaves out 3-4 chapters of the format	Report leaves out more than 4 chapters of the format
Proper citations (whole report)	Every statement is either original, or is properly cited. Cited material is only a small portion of the whole (less than 10%)	Every statement is either original, or is properly cited. Cited material is sizable portion of the whole (between 10 and 30%).	Most of the statements are original, but there are some quotations that are not properly cited.	Most of the report is copied from some source, without proper citation.
Writing and English quality (whole report)	No errors in sentence structure and word usage. No spelling mistakes.	Almost no errors in sentence structure and word usage. Very few spelling mistakes.	Many errors in sentence structure and word usage. Many spelling mistakes.	Numerous and distracting errors in sentence structure and word usage.
Size of the report (whole report)	>30 pages	20-29 pages	10-19 pages	<10 pages
Motivation for the project (chapter 1 – introduction)	The motivation for the project, general background for the project, why it is needed are explained well.	The motivation for the project, general background for the project, why it is needed are explained but some important aspects are left out. .	The motivation for the project, general background for the project, why it is needed are explained poorly.	The motivation for the project, general background for the project, why it is needed are not explained at all.
Project Planning and Management (chapter 2)	13-16 of the items on the Project Planning & Management Checklist have been done.	9-12 of the items on the Project Planning & Management Checklist have been done.	5-8 of the items on the Project Planning & Management Checklist have been done.	Less than 5 items on the Project Planning & Management Checklist have been done.
Requirements Analysis (Chapter 2, sections 2.1 and 2.2)	A thorough requirements analysis has been performed and documented in detail, using IEEE standard and UML tools such as Class diagrams, Associations of classes, Context diagrams, Entity-class diagrams for static modeling, State transition diagrams, Communication and/or Sequence diagrams for dynamic modeling.	A satisfactory level of requirements analysis has been performed and documented, but some details have been left out.	Some requirements analysis has been performed and documented, but major parts have been left out	No formal requirements analysis has been performed or documented

Score / Criterion	4	3	2	1
Realistic Constraints (Chapter 2, section 2.3)	Economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability constraints that the solution must satisfy are identified	Most of the economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability constraints that the solution must satisfy are identified	Only a few of the economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability constraints that the solution must satisfy are identified	None of the economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability constraints that the solution must satisfy are identified
Ethical issues (Chapter 2, section 2.4)	All ethical issues relevant to the project have been discussed, including effect on the environment, effect in case system fails to function properly, effects on privacy, impact on employment, possibility of crime (hacking and data theft), protection against malware (viruses etc.), usage of pirated software	Most ethical issues relevant to the project have been discussed	Some ethical issues relevant to the project have been discussed	No discussion of ethical issues
System design (chapter 3)	Both high level and low level system design (overall architecture, database design in the form of E-R diagrams, UML diagrams etc.) are shown in sufficient detail and clarity in the report.	Both high level and low level system design (overall architecture, database design in the form of E-R diagrams, UML diagrams etc.) are shown, but in not enough detail and clarity in the report.	Although system design is shown in the report, it is not informative at all.	No System design is shown in the report.
Implementation (chapter 4, sections 4.1, 4.2,4.4)	All requirements have been implemented fully. Tools, technologies and platforms used, algorithms developed, as well as the details of the implementation have been described thoroughly and clearly.	Most but not all of the requirements have been implemented. Tools, technologies and platforms used, algorithms developed, as well as the details of the implementation have been described at a reasonable level.	Less than half of the requirements have been implemented. Tools, technologies and platforms used, algorithms developed, as well as the details of the implementation have been poorly described	There is only minimal or no implementation of the requirements. Tools, technologies and platforms used, algorithms developed, as well as the details of the implementation have not been described at all.
Standards (chapter 4, section 4.3)	There is a discussion of the relevant standards and the degree to which they have been used.	Relevant standards are stated, but their utilization is not discussed.	Standards that are not truly applicable to the project have been mentioned.	There is no mention of standards at all.

Testing (chapter 5)	Includes strategies used for testing, test data employed, results of the testing, as well as corrective actions taken considering the test results. Thorough testing of the solution is evident.	Includes strategies used for testing, test data employed, results of the testing, as well as corrective actions taken considering the test results. Somewhat incomplete testing of the solution is evident.	Some testing has been performed, but not enough to permit its use without reservations.	No testing has been performed, and no results are reported
User guide for the system (chapter 6)	The system with all its functionality is explained clearly and in sufficient detail	The system with all its functionality is explained, but some explanations are unclear or not in enough detail	Only part of system's functionality is explained, and some are unclear or not in enough detail	No useful explanation of the system's functionality is present
Description of the solution's impact in the global, economic, environmental and societal context. (chapter 7- discussion)	The solution's impact in the global, economic, environmental and societal context are analyzed and explained thoroughly	Most of the solution's impact in the global, economic, environmental and societal context are analyzed and explained	Only some of the solution's impact in the global, economic, environmental and societal context are analyzed and explained	None of the solution's impact in the global, economic, environmental and societal context are analyzed and explained
References	Includes more than 10 major references	Includes 5-10 major references.	Includes 3-4 major references.	Includes less than 3 major references.
Appendices	Report has at least appendices A and B, appendix A explains clearly the instructions for installing the system, and appendix B contains all of the significant code	Report has at least appendices A and B, appendix A explains poorly the instructions for installing the system, or appendix B contains only some of the significant code	Report leaves out one of appendices A or B.	Report has no appendices

II. Cooperation with the supervisor

Score / Criterion	4	3	2	1
Frequency of interaction with the instructor	Student visited his supervisor 8 or more times	Student visited his supervisor 6-7 times	Student visited his supervisor 4-5 times	Student visited his supervisor less than 4 times
Progress reports	Student presented 4 or more progress reports	Student 3 progress reports	Student presented 2 progress reports	Student presented one or no progress report
Project development	Project was developed with full supervisor involvement at each step.	Project developed with supervisor involvement only at major milestones.	Project developed with minimal supervisor involvement.	Project developed with no supervisor involvement except the initial determination of the project topic.

III. Quality and contribution of the project

Score / Criterion	4	3	2	1
Multi-disciplinary development	The project was designed/implemented by a team of people from different disciplines and included at least one person outside of engineering	Project was designed/implemented by at least one computer/software engineer and a person from another engineering field	Project was designed/implemented by at least one software engineer and one computer engineer	Project was designed/implemented by person(s) from the computer/software engineering discipline (only one discipline involved)
Contribution of new ideas	Project contains many new and innovative ideas.	Project contains some new and innovative ideas.	Project contains few new and innovative ideas.	Project contains no new ideas and innovative ideas.
Implementation quality	Project has a solid, robust implementation. It is designed and implemented using well-established engineering principles, and can handle all conceivable error conditions.	Project has an acceptable implementation that works under normal circumstances, but cannot handle all error conditions.	Project has an acceptable implementation that works under normal circumstances, but cannot handle most error conditions.	Project has a shaky implementation that hardly works correctly.
Use of modern implementation tools	State of the art engineering tools and techniques have been used in the design and implementation of the project (languages, frameworks, hardware etc.)	Current, widely used engineering tools and techniques have been used in the design and implementation of the project.	Engineering tools and techniques that are still used, but have been superseded by more up-to-date ones and are about to be retired have been used in the design and implementation of the project.	Outdated, no longer current engineering tools and techniques have been used in the design and implementation of the project.
Project solves a realistic problem	Project solves a real/significant problem	Project solves a simplified version of a	Project solves a vastly simplified version of a	Project solves a toy problem, without any

	and can be used without modification.	real/significant problem, but can easily be extended to solve the real-life problem.	real/significant problem, and requires major modification before it can be used to solve the real-life problem.	real-life application.

IV. PRESENTATION

Score / Criterion	4	3	2	1
Organization	The topic was introduced clearly and creatively. Focus was maintained on the topic and the contribution was highlighted. The conclusion was logical, effective and relevant.	The topic was introduced clearly. Focus was maintained and the contribution was highlighted. The conclusion was satisfactory.	The topic was not clearly introduced. The contribution was not obvious. Focus on the topic was not steady. There was a conclusion.	The topic was not clearly introduced. Focus was not maintained on the topic. The contribution was not clear. There was no conclusion.
Time usage	All parts of the presentation were finished, where each part received enough time relative to its importance.	All parts of the presentation were finished, but time allocated to each part was somewhat disproportionate to its significance.	All parts of the presentation were finished, but time allocated to each part was largely disproportionate to its significance.	Major part of the presentation was not finished.
Quality and relevance of the slides	Slides were high quality, informative, attractive and contained useful graphics.	Slides were of standard quality, and sufficiently informative.	Slides were of low quality, and less than fully informative.	Slides were totally unattractive and not informative at all.
Communication Skills	The project was presented in an enthusiastic, clearly understandable manner; listener interest in the topic was aroused and maintained.	The project was presented in a reasonable way, with some attention being paid to how it was received.	The project was presented in a dull and boring way, without any enthusiasm.	Presentation was almost incomprehensible and/or uninteresting.
Questions and Answers	The student demonstrated extensive knowledge of the topic by responding confidently, precisely and appropriately to all audience questions and feedback.	The student demonstrated knowledge of the topic by responding accurately and appropriately to questions and feedback.	The student demonstrated some knowledge of the topic by responding accurately and appropriately to questions and feedback.	The student demonstrated incomplete knowledge of the topic by responding inaccurately and inappropriately to questions and feedback.