

Homework 11: Reliability and Safety Analysis					
Section	Description	Max	Poor	Good	Excellent
			0-2 / 0-5 / 0-14	3-4 / 6-8 / 15-20	5 / 9-10 / 21-25
1	Introduction	5	Introduction of product inappropriately short or omitted.	Introduction of product is included but of inappropriate detail	Introduction of product is concise and effective, report topic is introduced.
2	Reliability Analysis	20	Insufficient number of components analyzed, or components analyzed were inappropriate for project reliability analysis. Significant errors in failure rate and MTTF calculations. Assumptions and justifications for components and calculations omitted or inappropriate.	Microcontroller and high-complexity ICs analysed. Component analysis justifications included. Calculations for failures/MTTF included with possible minimal errors. Assumptions made were mostly reasonable.	3-5 reasonable components selected for analysis. Appropriate, effective explanations for component selection choices. Shows calculations for failure rate and MTTF for each component. Component models and assumptions for calculations were stated and appropriate.
	Mean Time to Failure (MTTF) Tables	10	MTTF table and/or calculations omitted.	Comments regarding parameter values not included.	Parameters used for each component analyzed presented in table. Appropriate comments included to explain choices. (e.g. States the operating temperature assumed)
	Reliability Analysis Conclusions	10	Reliability analysis conclusions omitted or inappropriately detailed. Does not suggest design or analysis refinements for improvement of reliability of the design.	Poorly summarizes the reliability of components analysed. Suggests unrealistic refinements to the design or suggests refinements that would not improve reliability by much.	Summarizes conclusions about the reliability of these components and/or the circuit in general. Suggests design or analysis refinements that would realistically improve the reliability of the design.
3	Failure Mode, Effects, and Criticality Analysis (FMECA)	10	Criticality levels omitted or poorly justified. Defines an unacceptable failure rate ( $\geq 10^{-9}$ ) for a level of failure that may cause injury to the user.	Defines only one criticality level or criticality levels unreasonable. Description/justification of criticality levels inappropriate. "High" criticality level limited to safety-critical failures, levels of failure that may potentially cause injury to users have an acceptable failure rate ( $< 10^{-9}$ ).	Defines 2+ criticality levels for the system. Effective, concise description of criticality levels. "High" criticality level limited to safety-critical failures. All acceptable failure rate levels defined and appropriate.
	Schematic of functional blocks (Appendix A)	5	Schematic omitted or relevant schematic portions incomprehensible. Division of functional blocks not depicted or intuitive from looking at schematic.	Schematic included and comprehensible. Division of functional blocks may be inappropriate.	Schematic included and readable. Schematic appropriately divided into various functional blocks.
	FMECA Worksheet (Appendix B)	25	Omitted significant failure conditions for 1+ functional blocks. Failed to consider failure conditions of 1+ major components. Incorrect conclusions for effect of 1+ failure modes. Inappropriate method of detection for multiple failure modes ('observation' is not an appropriate detection method for all failure modes)	Most relevant failure conditions of each functional block listed. Lists major components that could cause each failure condition. Failure modes mostly have correct effects listed.	Comprehensively lists the failure conditions for each functional block. Lists all components that may be responsible for each failure condition. Effects of each failure mode correctly considered and listed. Lists several good methods of detection for more critical failure modes.
4	Summary	5	No summary or summary may be inappropriate.	Discussion of safety and reliability issues is lacking in summary.	Summary is effective and concise, with appropriate discussion or report issues
5	References	10	No use of IEEE format. References are largely incomplete.	Must use IEEE format. A few references may be missing (1 or 2). Links to MIL-HDBK-217F.	All relevant component data sheets included. References correctly formatted.