Engineering Scoring Rubric for Senior Design Oral Presentations and Posters, Version 5.2

Engineering Scor		, 	4	2	2.	1
Outcome	N/A	Score	Exemplary	Proficient	Apprentice	Deficient
3.c.i. Identified project objectives			All important project	Important objectives are	Most objectives are	Most or all important
based on general project/client			objectives are identified.	identified but one or two	identified but at least one	objectives are not identified.
requirements				minor ones are missing.	or two important ones are missing	identified.
3.c.ii. Gathered and used relevant			All relevant information	Sufficient information is	Some information is	No significant background
customer information			is obtained and used to	obtained and used to	obtained but more is	information is gathered.
			support design recommendations.	support design recommendations.	needed to support design recommendations.	
3.c.iii. Applied concepts learned				d use		d have used
			☐ Prob & Stats ○ Prob distributions	☐ Methods/Productivity & Human Factors	☐ Prob & Stats ○ Prob distributions	☐ Methods/Productivity & Human Factors
			• Estimation	• Process flow analysis	• Estimation	• Process flow analysis
9			Simple hypothesis testANOVA/DOE		Simple hypothesis testANOVA/DOE	 Charting Work meas/MOST
			• Regression	 Work meas/MOST Productivity measure	• Regression	• Productivity measure
B			∘ SQC	o JIT	∘ SQC	o JIT
			□ OR ○ Modeling	 Lean Task Analysis	□ OR ○ Modeling	 Lean Task Analysis
			 Linear programming 	 Cognitive HFE 	 Linear programming 	 Cognitive HFE
5.0			Markov chainsQueuing	 Erogonmics Safety/Work environmt	Markov chainsQueuing	 Erogonmics Safety/Work environmt
ii.			Decision analysis	☐ Manfg & Facilities	Decision analysis	☐ Manfg & Facilities
Industrial Engineering Exampl			○ Simulation	 Engineering drawings 	o Simulation	 Engineering drawings
Je			☐ EMngt ○ Project Management	Surface & solid modelsCAD software	☐ EMngt ○ Project Management	Surface & solid modelsCAD software
-50			 Organizations/teams 	 Group technology 	 Organizations/teams 	 Group technology
T T			 Motivation and Leadership	AutomationRobots	 Motivation and Leadership	AutomationRobots
			 Labor relations 	• ADC	 Labor relations 	• ADC
व			• Time value of money	○ Machines	• Time value of money	○ Machines
• •			Cash flow analysisCost concepts	☐ Production Ops ○ Process planning	Cash flow analysisCost concepts	☐ Production Ops ○ Process planning
1 2			 Accounting 	O Pull manufacturing	○ Accounting	OPull manufacturing
gn			 Altern analysis. Quality philosophies	 Leveling and balancing Material handing	 Altern analysis. Quality philosophies	Leveling and balancingMaterial handing
, in the second			Kaizen	○ REL charts/Flow	• Kaizen	• REL charts/Flow
			○ Globalization □Info Systems	 Forecasting Invent Control Model	○ Globalization	• Forecasting
			O Databases	• MRP	□Info Systems ○ Databases	 Invent Control Model MRP
	1	ı	o Programming		o Programming	T 4
3.c.iv. Considered relevant apsects			4 Exemplary	3 Proficient	2 Apprentice	1 Deficient
Economic			4 Exemplary Have economic implication	Proficient ons of proposed solution or p	2 Apprentice process changes been consideration	Deficient lered?
			4 Exemplary Have economic implication What is the impact of the	Proficient ons of proposed solution or psolution on manufacturing?	Apprentice process changes been considered in the considered in th	Deficient lered?
Economic			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc.	Deficient lered? ing that? This may also
Economic Manufacturability Ethical/health and safety			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety co	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed neerns?	Apprentice process changes been considered. If so, what is entailed in does scheduling, logistics, etc. d solution? Does the proposed to the p	Deficient lered? ing that? This may also led solution have safety
Economic Manufacturability Ethical/health and safety Social/political			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety contact there social and/or provehicle routing for meals	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? litical impacts of the proposed on wheels, etc.)	Apprentice process changes been considered from the solution of the proposition of the pr	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety conference in the control of the proposed solution to the control of the	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed on wheels, etc.) on have any positive or negati	Apprentice process changes been considered in the second of the second in the second i	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety conference in the control of the proposed solution to the control of the	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? litical impacts of the proposed on wheels, etc.)	Apprentice process changes been considered in the second of the second in the second i	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals Does the proposed solution solution long term use and Experiment well-designed to obtain needed.	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed solutical impacts of the proposed son wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions;	Apprentice process changes been considered in the scheduling, logistics, etc. disolution? Does the proposed solution; and have they leave environmental impacts are verse logistics)? Design adequate, but not outstanding; lacked some	Deficient lered? ing that? This may also led solution have safety been addressed? (e.g. c) Does the proposed
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed solutical impacts of the proposed son wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented	Apprentice process changes been considered in the scheduling, logistics, etc. disolution? Does the proposed solution; and have they leave environmental impacts reverse logistics)? Design adequate, but not outstanding; lacked some control; information	Deficient lered? ing that? This may also led solution have safety been addressed? (e.g. c) Does the proposed Poor design; information
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner.	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed solutical impacts of the proposed son wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally	Apprentice process changes been considered in the scheduling, logistics, etc. disolution? Does the proposed solution; and have they be live environmental impacts reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive.	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g. leen Does the proposed leen design; information obtained of little value.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? litical impacts of the proposed wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and	Apprentice process changes been considered in the scheduling, logistics, etc. disolution? Does the proposed solution; and have they be solved in the scheduling in the schedul	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g. leen Does the proposed leen design; information obtained of little value. Analysis and resultant
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation			4 Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner.	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed solutical impacts of the proposed son wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally	Apprentice process changes been considered in the scheduling, logistics, etc. disolution? Does the proposed solution; and have they be live environmental impacts reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive.	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g. leen Does the proposed leen design; information obtained of little value.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation			A Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed needs, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few	Apprentice process changes been considered in the scheduling, logistics, etc. desolution; and have they be solution; and have they be solved in the solution; and the solution in the solu	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g. leen addressed? in the proposed leen addressed? (e.g. leen address
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation			A Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed needs, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few	Apprentice process changes been considered in the scheduling, logistics, etc. desolution; and have they be solution; and have they be solved in the solution; and the solution in the solu	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g. leen addressed? in the proposed leen addressed? (e.g. leen address
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation			A Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions	Proficient ons of proposed solution or proposed solution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed needs, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few	Apprentice process changes been considered in the scheduling, logistics, etc. and solution? Does the proposed solution; and have they be sive environmental impacts are verse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is	Deficient dered? ing that? This may also ded solution have safety deen addressed? (e.g. Does the proposed Poor design; information obtained of little value. Analysis and resultant interpretation seriously flawed or non-existent. Only one solution
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis			A Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed nave any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other	Apprentice process changes been considered in the scheduling, logistics, etc. and solution? Does the proposed solution; and have they be a solution; and a solution and a solution and a solution and a solution is a solution is a solution is a solution is a solution and a solution is a solution is a solution and a solution is a solution and a solution and a solution is a solution and a solution are solution as a solution and a solution and a solution and a solution are solution as a solution and a solution are solution as a solution and a solution are solution as a solution are solution as a solution are solution as a solution are solution.	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant			A Exemplary Have economic implication What is the impact of the involved production system Are there ethical consider benefits or raise safety con Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed nave any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is	Apprentice process changes been considered in the scheduling, logistics, etc. and solution? Does the proposed solution; and have they be sive environmental impacts are verse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis			A Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or povehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? Itical impacts of the proposed nature of the proposed nature of the proposed maintainability (i.e. reuse, well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have	Apprentice process changes been considered in the scheduling, logistics, etc. and solution? Does the proposed solution; and have they be a solution; and they are a solution and a solution and a few serious flaws. Satisfactory solution is recommended; better solutions were available	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints			A Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety concentration and/or provehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints.	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? Ilitical impacts of the proposed on wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed.	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution; and have they leave environmental impacts? reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is recommended; better solutions were available and should have been considered.	Deficient dered? ing that? This may also ded solution have safety deen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints 3.g.i. Written communications			Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or povehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed nave any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical	Apprentice process changes been considered in the scheduling, logistics, etc. and solution? Does the proposed solution; and have they be a solution; and for interpretation contain a few serious flaws. Satisfactory solution is recommended; better solutions were available and should have been	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints			Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or povehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents recommendations and	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the propose neerns? ditical impacts of the propose on wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical and/or rhetorical errors;	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution; and have they leave environmental impacts? The environmental impac	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints 3.g.i. Written communications (based on executive summary			A Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or powehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents recommendations and analysis, well organized,	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed neerns. Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical and/or rhetorical errors; logically presents	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution; and have they leave the environmental impacts? The environmental i	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints 3.g.i. Written communications (based on executive summary			Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or povehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents recommendations and	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed needs? Iditical impacts of the proposed on wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical and/or rhetorical errors; logically presents recommendations and analysis, well organized,	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution; and have they leave environmental impacts? reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is recommended; better solutions were available and should have been considered. Written report generally well written but contains some grammatical, rhetorical and/or organizational errors; recommendations and	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints 3.g.i. Written communications (based on executive summary			A Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or povehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents recommendations and analysis, well organized, easy to read, and contains	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? Iditical impacts of the proposed on wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical and/or rhetorical errors; logically presents recommendations and analysis, well organized, easy to read and contains	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution; and have they leave environmental impacts? reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is recommended; better solutions were available and should have been considered. Written report generally well written but contains some grammatical, rhetorical and/or organizational errors; recommendations and analysis are mentioned but	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints 3.g.i. Written communications (based on executive summary and poster)			A Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or povehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents recommendations and analysis, well organized, easy to read, and contains	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? Itical impacts of the proposed maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical and/or rhetorical errors; logically presents recommendations and analysis, well organized, easy to read and contains high quality graphics. Very good presentation;	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution; and have they leave environmental impacts? reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is recommended; better solutions were available and should have been considered. Written report generally well written but contains some grammatical, rhetorical and/or organizational errors; recommendations and analysis are mentioned but not fully discussed Adequate but not	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints 3.g.i. Written communications (based on executive summary			A Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or powehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents recommendations and analysis, well organized, easy to read, and contains high quality graphics. Exceptional presentation; logically organized;	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed neerns? ditical impacts of the proposed on wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical and/or rhetorical errors; logically presents recommendations and analysis, well organized, easy to read and contains high quality graphics. Very good presentation; well organized; all aspects	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution; and have they leave environmental impacts reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is recommended; better solutions were available and should have been considered. Written report generally well written but contains some grammatical, rhetorical and/or organizational errors; recommendations and analysis are mentioned but not fully discussed Adequate but not outstanding presentation;	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints 3.g.i. Written communications (based on executive summary and poster)			A Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety concentration and constraints. Are there social and/or provehicle routing for meals. Does the proposed solution solution long term use and experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents recommendations and analysis, well organized, easy to read, and contains high quality graphics. Exceptional presentation; logically organized; group members well	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed solution built into the proposed on wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical and/or rhetorical errors; logically presents recommendations and analysis, well organized, easy to read and contains high quality graphics. Very good presentation; well organized; all aspects were meaningful and added	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution? Does the proposed solution; and have they leave environmental impacts? reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is recommended; better solutions were available and should have been considered. Written report generally well written but contains some grammatical, rhetorical and/or organizational errors; recommendations and analysis are mentioned but not fully discussed Adequate but not outstanding presentation; lacked some	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.
Economic Manufacturability Ethical/health and safety Social/political Environmental/sustainability 3.b.i. Conducted necessary experimentation 3.b.ii. Conducted necessary data analysis 3.c.v. Chose the best solution based on technical and economic criteria and considering relevant constraints 3.g.i. Written communications (based on executive summary and poster)			A Exemplary Have economic implication What is the impact of the involved production systed. Are there ethical consider benefits or raise safety con Are there social and/or powehicle routing for meals. Does the proposed solution solution long term use and Experiment well-designed to obtain needed information; conducted and documented in a professional manner. Appropriate statistical/analytical analysis performed; proper assumptions made; results correctly interpreted. Best solution is recommended based on stated criteria and constraints. Written report error-free, logically presents recommendations and analysis, well organized, easy to read, and contains high quality graphics. Exceptional presentation; logically organized;	Proficient ons of proposed solution or psolution on manufacturing? m design: layout, inventory, ations built into the proposed solution built into the proposed on wheels, etc.) on have any positive or negated maintainability (i.e. reuse, Well designed experiment with minor exceptions; conducted and documented professionally Appropriate analysis and interpretation with a few minor exceptions. Reasonable solution is recommended; other alternatives should have been developed and analyzed. Written report contains a few, minor grammatical and/or rhetorical errors; logically presents recommendations and analysis, well organized, easy to read and contains high quality graphics. Very good presentation; well organized; all aspects were meaningful and added to the presentation; high	Apprentice process changes been considered. If so, what is entailed in do scheduling, logistics, etc. desolution? Does the proposed solution; and have they leave environmental impacts reverse logistics)? Design adequate, but not outstanding; lacked some control; information reliable, but not definitive. Analysis and/or interpretation contain a few serious flaws. Satisfactory solution is recommended; better solutions were available and should have been considered. Written report generally well written but contains some grammatical, rhetorical and/or organizational errors; recommendations and analysis are mentioned but not fully discussed Adequate but not outstanding presentation;	Deficient lered? ing that? This may also led solution have safety leen addressed? (e.g.