

Rubric Instructions

The scoring rubric is intended to simplify the process of assigning grades, and to increase the likelihood that consistent scores are given for comparable achievement by different groups. The rubric also provides a way to give feedback to students without having to write detailed comments.

Team members: _____ out of a maximum of 10 points

Excellent (8 to 10 points)	Satisfactory (4 to 7 points)	Below expectations (0 to 3 points)
<input type="checkbox"/> All team members are listed with their pdx.edu email. <input type="checkbox"/> Elective courses and prior work experience relevant to the project is listed for each team member.	<input type="checkbox"/> Team members are listed without pdx.edu email. <input type="checkbox"/> Prior experience and coursework is listed without focusing on skills relevant to the project.	<input type="checkbox"/> Team member list is incomplete or missing. <input type="checkbox"/> Relevant prior experience and coursework is missing.

Additional Comments:

Project Objective Statement: _____ out of a maximum of 8 points

Excellent (7 to 8 points)	Satisfactory (4 to 6 points)	Below expectations (0 to 3 points)
<input type="checkbox"/> Project Objective Statement uses the one-sentence format described in part 2 of the textbook. <input type="checkbox"/> Project Objective Statement is clear, concise and specific, i.e. it is well-written. <input type="checkbox"/> Project Objective Statement clearly indicates the scope (overall goal), due date, and resources available to the team.	<input type="checkbox"/> Project Objective Statement deviates somewhat from format described in the textbook. <input type="checkbox"/> As prose, the Project Objective Statement would benefit from revision for clarity, conciseness or specificity. <input type="checkbox"/> Key information that should be in the Project Objective State may be missing or poorly matched to the objectives of the design project.	<input type="checkbox"/> Project objective statement is missing, or deviates significantly from the format described in the textbook. <input type="checkbox"/> Project objective statement is very poorly written. <input type="checkbox"/> Project objective statement is not helpful in describing scope and/or resources and/or due date.

Additional Comments:

Client Needs (Market Requirements): _____ out of maximum of 15 points

Excellent (15 to 20 points)	Satisfactory (8 to 14 points)	Below expectations (0 to 7 points)
<ul style="list-style-type: none"> <input type="checkbox"/> The list of client needs is detailed, reasonably complete, and goes well beyond the information provided in the project description. <input type="checkbox"/> Client needs are grouped into a modest number (say 5 to 10) primary needs, and subsidiary secondary needs. <input type="checkbox"/> Primary client needs are sufficiently distinct that they can be met independently. <input type="checkbox"/> Each primary client need is given a numerical importance value that is reasonable and reflects potential for creating a desirable product or design. 	<ul style="list-style-type: none"> <input type="checkbox"/> The list of client needs as given is accurate (or helpful), but should be expanded further to include more, or a different set of, needs <input type="checkbox"/> Client needs are grouped, but some rearrangement or re-prioritization would be helpful <input type="checkbox"/> Some primary client needs overlap, suggesting that further refinement would be valuable. <input type="checkbox"/> Importance values for primary needs are given, but could be refined. 	<ul style="list-style-type: none"> <input type="checkbox"/> Client needs are completely or substantially repeated from the project description document. No further effort is evident. <input type="checkbox"/> Client needs are listed without grouping into primary and related secondary needs, OR client needs list is so sparse that a grouping is warranted. <input type="checkbox"/> Primary client needs are vaguely worded and overlap. <input type="checkbox"/> Importance values for primary client needs are missing, or have numerical values that make them unhelpful.

Additional Comments:

Performance measures: _____ out of maximum of 15 points

Excellent (13 to 15 points)	Satisfactory (7 to 12 points)	Below expectations (0 to 6 points)
<ul style="list-style-type: none"> <input type="checkbox"/> Each performance measure is given as a metric plus a value, and the performance measures will be useful in guiding design decisions. <input type="checkbox"/> There is at least one performance measure for every client need <input type="checkbox"/> The requirements matrix (needs-metrics matrix) lists all primary client needs, all relevant performance measures, and indicates the relationships between client needs and performance measures 	<ul style="list-style-type: none"> <input type="checkbox"/> List of performance measures could be more complete or formulated with better metrics or values. Despite weaknesses, good progress is being made. <input type="checkbox"/> Performance measures could be refined to provide better linkage to client needs. <input type="checkbox"/> Requirements matrix is helpful, but should be more so. 	<ul style="list-style-type: none"> <input type="checkbox"/> Items listed as performance measures are not effective metrics. Target values for these performance measures are lacking or unhelpful. <input type="checkbox"/> Many client needs lack performance measures. <input type="checkbox"/> Requirements matrix is missing, or not helpful in providing guidance for engineering decisions.

Additional Comments:

Design challenges: _____ out of a maximum of 7 points

Excellent (6 to 7 points)	Satisfactory (3 to 5 points)	Below expectations (0 to 2 points)
<ul style="list-style-type: none"> <input type="checkbox"/> Specific and important challenges are clearly identified. Overcoming those challenges will allow the team to create a desirable and transferable design. <input type="checkbox"/> Team plans reflect the need to prioritize work on the most challenging aspects of the design project. 	<ul style="list-style-type: none"> <input type="checkbox"/> Some important design challenges are identified. The team is encouraged to think more deeply and strategically on how to focus on the most important work to be done. <input type="checkbox"/> Better focus of efforts on key challenges is advised. 	<ul style="list-style-type: none"> <input type="checkbox"/> Client needs are listed as design challenges without a demonstrated understanding of the relative difficulty or importance. Key challenges are missed or downplayed. <input type="checkbox"/> No prioritization of work relative to difficulty/challenge in achieving overall project goals

Additional Comments:

Plans for completing the project – design techniques: _____ out of maximum of 25 points

Excellent (20 to 25 points)	Satisfactory (10 to 19 points)	Below expectations (0 to 9 points)
<ul style="list-style-type: none"> <input type="checkbox"/> Plans for information gathering (broad external search) are well thought out, specific, and demonstrate that the team has a good start on finding relevant information. <input type="checkbox"/> Plans for a market analysis are relevant to client needs (e.g. appropriate benchmarks, similar products) and/or demonstrate understanding of competing solutions to similar problems. <input type="checkbox"/> Plans for prototype development throughout the project timeline are well thought out and will lead to good balance of effort, information generation, idea validation and performance verification. <input type="checkbox"/> A good mix of analysis techniques at different levels of sophistication are proposed. The team demonstrates an understanding of how to use analysis and modeling to make design decisions. 	<ul style="list-style-type: none"> <input type="checkbox"/> Plans for information gathering are reasonable and show some good thinking. More effort is needed. <input type="checkbox"/> Better understanding of existing solutions and market needs will help the team be more successful. <input type="checkbox"/> More careful planning to use prototypes, especially at intermediate stages design process, would benefit the team’s effort at engineering analysis, component selection, CAD work and performance verification. <input type="checkbox"/> More specific plans for analysis and modeling are warranted. 	<ul style="list-style-type: none"> <input type="checkbox"/> Plans for information gathering are inadequate. OR the team does not demonstrate an understanding of how an external search can be conducted effectively. <input type="checkbox"/> Little or no credible documentation is given on team’s understanding of current solutions, competition, or market effects that relate to design goals and process. <input type="checkbox"/> Team appears to be planning only one prototype to be developed at the very end of the project. Team does not show understanding of potential for using prototypes to augment engineering analysis, component selection, CAD work, and performance verification. <input type="checkbox"/> Analysis and modeling plans are lacking, or those proposed by the team are not linked to specific engineering decisions. The utility of analysis (reason for doing it) is not apparent.

Additional Comments:

Physical, component, manufacturing and other resource needs: _____ out of maximum of 10 points

Excellent (8 to 10 points)	Satisfactory (4 to 7 points)	Below expectations (0 to 3 points)
<ul style="list-style-type: none"> <input type="checkbox"/> List of physical space, component, sensor, and manufacturing needs demonstrate good understanding of engineering process requirements and practical constraints. <input type="checkbox"/> Practical constraints on resource acquisition and material purchases are reasonable given early stage in the project, and also reasonable given the project budget. <input type="checkbox"/> The team demonstrated an understanding its limits and has plans for getting expert advice or guidance on specific areas that are important to the success of the project. 	<ul style="list-style-type: none"> <input type="checkbox"/> List of physical space, component, sensor, and manufacturing needs will need to be developed further in order to make effective project plans. <input type="checkbox"/> Better planning for equipment resource acquisition and material purchases would be good. Regardless of need for more work, current understanding shows common sense. <input type="checkbox"/> Team should seek out expertise to augment its own knowledge and skills. 	<ul style="list-style-type: none"> <input type="checkbox"/> List of resource needs is unrealistic: either inadequate or beyond a practical understand of constraints for capstone teams. <input type="checkbox"/> Plans for resource acquisition and material purchases are significantly lacking or unrealistic. <input type="checkbox"/> Team needs to demonstrate awareness of their expertise limits and develop a plan for finding help outside of their own direct experience.

Additional Comments:

Key milestones and deliverables: _____ out of maximum of 10 points

Excellent (8 to 10 points)	Satisfactory (4 to 7 points)	Below expectations (0 to 3 points)
<ul style="list-style-type: none"> <input type="checkbox"/> Items identified as milestones are specific dates linked to significant points along the project evolution. The choice of milestones is likely to aid in project planning. <input type="checkbox"/> Items identified as deliverables are linked to specific outcomes necessary for achieving project success. Items listed as deliverable are discrete outputs, not tasks or milestones. 	<ul style="list-style-type: none"> <input type="checkbox"/> <input type="checkbox"/> 	<ul style="list-style-type: none"> <input type="checkbox"/> Milestones are lacking, or items listed as milestones are simply a weekly list of activities taken from the Roadmap for ME 492-493. <input type="checkbox"/> Items listed as deliverables are not specific items or useable information.

Additional Comments: