

**Innovation and Design** – The graduate often asks questions and makes observations that lead to new ideas or hypotheses. He or she formulates highly original solutions while moving beyond the conventional to new methods blending creative and practical approaches, methods and designs which may involve pioneering applications along the interface of engineering and biology.

Learning Indicators	Level 4	Level 3	Level 2	Level 1
	Master	Proficient	Apprentice	Novice
<b>1.0 Exhibits curiosity, wonder, and excitement while actively seeking out new challenges</b>	Continually strives to learn about new ideas, situations and opportunities; Always sees problems as opportunities for innovation; Suggests multiple novel approaches to selected problems and/or opportunities; Consistently and independently makes original observations	Shows substantial interest in new ideas and approaches; Occasionally suggests a new or novel approach to a problem and/or opportunity; Independently makes original observations	Shows some interest in new ideas or new approaches to problems and/or opportunities; Able to make novel observations with encouragement	Appears uninterested in new topics or ideas; Does not suggest new approaches to existing problems; Does not often make original observations.
<b>2.0 Ability to identify a problem or opportunity</b>	A problem or opportunity has been shown to exist supported by factual evidence	A problem or opportunity has been identified with some supporting evidence	A problem or opportunity has been identified without supporting evidence	The problem or opportunity has not been clearly stated and there is no supporting evidence
<b>3.0 Ability to generate unique and/or original ideas to take advantage of a problem or opportunity</b>	Suggests multiple novel solutions to problems and/or opportunities; Able to link seemingly unrelated ideas in innovative ways; Is not constrained by current methods or solutions; Always goes beyond assignment parameters	Able to suggest at least 1 novel or unique solution to a problem and/or opportunity with minimal support; Ideas go beyond current applications and/or solutions; Often exceeds assignment parameters	Able to suggest a unique or novel solution to a problem and/or opportunity with significant guidance and encouragement; Solutions constrained by current situation; Rarely exceeds assignment parameters	Unable to generate a unique or original solution to a problem and/or opportunity; Suggests solutions based upon already known products or designs Does not go beyond basic parameters of any assignment.
<b>4.0 Ability to create a practical design strategy</b>	Develops a design strategy, including a plan of attack, decomposition of work into subtasks, and a timetable; A comprehensive listing of critical design criteria are provided and justified.	Develops a design strategy including a plan of attack, partial decomposition of work into subtasks, and a timetable; Most critical design criteria are provided and justified.	Develops a design strategy with guidance. Some subtasks may be missing and the timetable is incomplete or unrealistic. Some critical design criteria are absent or unjustified.	No comprehensive design is developed; Does not decompose work into manageable subtasks and time table is unrealistic or absent; Many design criteria are absent and most are not justified.
<b>5.0 Ability to delineate the scope of the project</b>	Expectations and/or deliverables are clearly stated and can be attained with available resources; A set of performance metrics to evaluate the level of success has been created.	Most expectations and/or deliverables have been stated; Not all may be obtainable with available resources; Some metrics for produce/process evaluation have been created.	Some expectations and/or deliverables have been stated; Several are unrealistic given available resources; Little attention has been paid to the development of metrics to evaluate level of success	Expectations and/or deliverables not clearly stated; No link evident between deliverables and available resources is evident; No metrics or evaluation plan provided to measure success
<b>6.0 Ability to incorporate and evaluate the impact of realistic constraints on the project</b>	Incorporates more than 5 major factors (economic; environmental; social; cultural; political; health & safety; manufacturability; sustainability; intellectual property) into the design and development process; Provides analysis which correctly reasons how each factor constrains a product or process; Provides sufficient in-depth discussion to explain analysis	Incorporates 2-5 major factors ( economic; environmental; social; cultural; political; health & safety; manufacturability; sustainability; intellectual property) into the design and development process; Correctly reasons how each factor constrains a product or process but provides a limited or inadequate explanation of the analyses	Incorporates only 1 major factor (economic, environmental; social; cultural; political; health & safety; manufacturability; sustainability; intellectual property) into the design and development process; Analysis contains a mixture of correct and incorrect reasoning as to how the design and/or development process is constrained by the factor.	Unable to identify a major constraining factor in the design and/or development process. Unable to correctly analyze how any factor constrains the design and development process when such a constraining factor is provided.
<b>7.0 Ability to execute the strategy</b>	All major expectations and/or deliverables have been attained	Most major expectations and/or deliverables have been attained.	Some major expectation and/or deliverables have been attained.	Few, if any major, expectations and/or deliverables have been attained.
<b>8.0 Ability to evaluate product or process</b>	The prototype product or process has been tested and successfully meets or exceeds all critical design requirements	Testing indicates that the prototype product or process successfully meets most critical design requirements	Testing indicates that the prototype product or process successfully meets less than half of the critical design criteria	Prototype testing was not done or if it was, the prototype product or process meets less than 20% of the critical design criteria.