Outcome	Developing-1	Competent-2	Exemplary-3
1. Students will be able to formulate a research question or problem	The research question or problem is neither testable nor manageable to contribute to existing research in the discipline.	The research question or problem is mostly testable, but requires refinement to become manageable to contribute to existing research in the discipline.	The research question or problem is articulated in a testable and evaluative approach to address a new to contribute to existing research in the discipline.
2. Students will be able to identify basic principles and knowledge related to their research question or problem 	<ul> <li>Principles and knowledge articulated by student are not relevant to the research question and/or are not accurately described or applied.</li> <li>Student does not demonstrate functional knowledge of how to effectively use research databases, sources to support the research question.</li> </ul>	<ul> <li>Relevant principles and knowledge that provide framework for the research question mostly accurate and applied somewhat consistently. There may be minor misunderstandings of specific knowledge or application.</li> <li>Student mostly uses research databases judiciously. At this level, student also includes some peripherally related or irrelevant information.</li> </ul>	<ul> <li>Relevant principles and knowledge that provide the framework for the research question are accurately described and applied.</li> <li>Student is able to judiciously use research databases (e.g. library, internet) and relevant sources to inform the research question.</li> </ul>
3. Students will be able to develop a research plan to address or resolve a specific question or problem.	<ul> <li>The research plan does not fully address the research question or problem.</li> <li>There is a haphazard quality to the research plan.</li> </ul>	<ul> <li>The research plan is mostly related to the research question or problem</li> <li>There are some moderate inconsistencies or problems that are not addressed in the research plan.</li> </ul>	<ul> <li>The research plan is logical and directly addresses the research question or problem.</li> <li>The research plan reflects best research practices within the context of the discipline.</li> </ul>

NOTE: Expectations outlined in this rubric are geared to undergraduate research and not doctoral level research.

[ARCH, ENG MechE, ENG CivilE, ENG IndustsrialE, TECH EngrTech, TECH ILT]

<ul> <li>4. Students will be able to collect and interpret data and information in an attempt to resolve the question or problem.</li> <li>Data collection. Data collected do not reflect a thorough or sound data collection process</li> <li>Relevance of data to research question. Data collected are not sufficiently relevant to the research question, with too much extraneous material</li> <li>Data interpretation. Interpretation of data is not accurate enough, or the student does not demonstrate effort to address bias in interpretation. There is insufficient description or use of validation procedures.</li> <li>Relevance of interpretation to research question or problem</li> <li>Coding, Programming, and Computation skills. Student was lacking in skills required for debugging codes, and application of relevant theory</li> </ul>	<ul> <li>Data collection. The collection process is generally sound.</li> <li>Relevance of data to research question. Data collected are mostly relevant to the research question, with some extraneous material.</li> <li>Data Interpretation. Interpretation of data is mostly accurate with some minor errors. There is some effort to minimize or address bias. Student attempts to use or describe validation procedures for data.</li> <li>Relevance of interpretation to research question. The interpretation of the data is linked to the original research question or problem.</li> <li>Coding, Programming, and Computation skills. Student was able to code adequately, draw relevant diagrams and figures to complete project.</li> </ul>	<ul> <li>Data collection. Data collected reflect a thorough and sound data collection process.</li> <li>Relevance of data to research question. Data collected directly address the research question, without extraneous material</li> <li>Data interpretation. Interpretation of data is accurate. Student demonstrates effort to minimize or address bias. Student describes appropriate data validation procedures. Student presents caveats and results that may not agree with hypothesis.</li> <li>Relevance of interpretation to research question. The interpretation of the data is clearly linked to the original research question or problem.</li> <li>Coding, Programming, and Computation skills. Student's ability to code was elegant, successfully debugged program, and was meticulous in the computations.</li> </ul>
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QEP Rubric: Research Student Learning Outcomes

Disciplinary Area: Applied Sciences

[ARCH, ENG MechE, ENG CivilE, ENG IndustsrialE, TECH EngrTech, TECH ILT]

5. Students will demonstrate awareness of the responsible conduct of research.	<ul> <li>The student vaguely articulates awareness of activities necessary for responsible conduct of research. There is no evidence of application of appropriate procedures, protocols, and ethical guidelines. There is evidence of plagiarism and/or inappropriate use of others' work.</li> <li>Where group work is involved, there is little or not evidence that the student contributed substantially to the team effort.</li> </ul>	<ul> <li>The student articulates awareness of activities necessary for responsible conduct of research but does not follow through on application of discipline-specific procedures, protocols, and ethical guidelines. There may be minor oversights in terms of cited work.</li> <li>Where group work is involved, there is some evidence that the student equitably contributes to team efforts.</li> </ul>	<ul> <li>The student demonstrates adherence to the responsible conduct of research through appropriate application of relevant discipline-specific procedures, protocols, and ethical guidelines. There is no evidence of plagiarism and others' work is cited appropriately.</li> <li>Where group work is involved, there is a preponderance of evidence that the student equitably contributes to team efforts.</li> </ul>
6. Students will be able to articulate their research findings through written, performance, and/or oral presentations.	<ul> <li>Facts and examples were seriously lacking in detail, inaccurate, or inappropriate.</li> <li>There is no clear connection between analyses, discussions, and examples, facts, and theories.</li> <li>The model, design was lacking in performance as specified.</li> </ul>	<ul> <li>Facts and examples were mostly detailed, accurate, and appropriate, but there were lapses.</li> <li>The connection between analyses, discussions, and conclusions is evident or implied, but it is not explicitly linked to examples, facts, and theories.</li> <li>The models and designs performed adequately.</li> </ul>	<ul> <li>Facts and examples were detailed, accurate, and appropriate.</li> <li>Analyses, discussions, and conclusions were explicitly linked to examples, facts, and theories.</li> <li>Project/Model performed as specified in the original design</li> </ul>