

## Undergraduate Research Taxonomy

ATTRIBUTE	HIGH IMPACT	HIGHER IMPACT	HIGHEST IMPACT
<b>The course instructor is well qualified (knowledge, experience)</b>	Expertise on subject matter; no experience conducting hands-on research with undergraduate students	Expertise on subject matter; some experience leading and conducting research with undergraduate students	Expertise on subject matter; extensive experience mentoring undergraduate student-led peer-reviewed research
<b>The teaching method(s) and course content should be aligned with student skill level</b>	Lecture-based teaching plus interactive small group learning: problem-based learning (PBL) and/or project-based learning. Attendance at local research conferences and symposia. Teaching content may include: literature review, research methodology, data management, ethics and compliance, research history.	Lecture-based teaching plus some limited non-classroom independent research experience mostly in a team setting (lab project, field project, etc.). Attendance at local research conferences and symposia. Teaching content: as in previous level.	Some classroom but mostly independent research activity with faculty mentor(s) including but not limited to team-based research. Teaching content: as in high impact level but structured so that students have learned foundational information in previous courses or research experiences (for example, research design in this discipline, statistics, lab techniques, scientific vocabulary). If they have not, there is a plan regarding how to develop these skills in the context of this course.
<b>Applied learning (application of current knowledge) is an essential component of research</b>	Instructor selects research papers and provides assignments related to content; development of research questions and hypotheses related to assigned projects.	Students draft a simple research study on an assigned topic following an independent literature review.	Drafting of an independent research study to fill a knowledge gap followed by completion of the research project.
<b>Ethics and safety in research are emphasized</b>	Students are exposed to ethical conduct and safety in research in their discipline.	Students are trained in ethics and safety in research (e.g., complete an IRB form to be reviewed by the instructor, complete CITI training).	The research projects meet the ethical and safety guidelines for responsible conduct of research. Projects involving animal or human subjects must undergo IRB approval, and the faculty member and students are (or will be) certified through the appropriate CITI training. For more information, visit

			<a href="http://research.kennesaw.edu/our/faculty/ethics-and-undergraduate-research.php">http://research.kennesaw.edu/our/faculty/ethics-and-undergraduate-research.php</a>
<b>Integration of critical and creative thinking is an essential component of research (interpret and evaluate information/data; solve problems; draw appropriate conclusions)</b>	<p>Critical thinking skills are learned through various activities assigned by instructor such as:</p> <ul style="list-style-type: none"> <li>• Evaluation of current published research in the field.</li> <li>• Working through PBL cases and/or team-based project assignments.</li> <li>• Assignments associated with attendance at local research conferences and symposia.</li> </ul>	<p>Critical thinking skills are improved through independent literature review and identification of knowledge gaps in the discipline.</p>	<p>The student is expected to:</p> <ul style="list-style-type: none"> <li>• Analyze and interpret qualitative and/or quantitative data from own research project</li> <li>• Consider alternative explanations of data;</li> <li>• Identify potential challenges in the research project and address them</li> </ul>
<b>Development of oral and written communication skills are integrated into the course</b>	<p>Facilitated in-class discussion and take-home assignments (e.g., group discussion of research papers; drafting of literature summary reports); oral and written reports of outcome of team-based projects.</p>	<p>Writing assignments (e.g., draft of a research study proposal); oral presentation of a paper to classmates with subsequent class discussion.</p>	<p>Posters, oral presentations, exhibitions, and/or public performances at local, regional or national venues; drafting of manuscripts for publication.</p>
<b>Critical reflection is well integrated into student learning</b>	<p>The instructor provides a detailed and structured template to facilitate students' reflection on their learning experience; only short answers are expected</p>	<p>The instructor provides limited guidance to encourage student reflection on the learning experience; some student self-assessment is expected.</p>	<p>The instructor requires students to critically reflect on the research experience and explore its relevance to academic content, personal growth and career aspirations. Cross-disciplinary reflection is required when appropriate (interdisciplinary or multidisciplinary projects).</p>
<b>Assessment is used to monitor student learning and make course improvements</b>	<p>Student learning and skill acquisition are assessed at the end of each learning unit related to research.</p>	<p>Student learning and skill acquisition are assessed more than once. A final paper is required in the form of a short research proposal draft.</p>	<p>Student learning and skill acquisition are assessed multiple times throughout the course. Students receive continuous feedback. The completion of multiple research drafts and a final report(s) are required. The syllabus contains a list of measurable learning outcomes geared toward undergraduate research in this discipline. A possible</p>

			list of outcomes can be found here: <a href="http://research.kennesaw.edu/our/faculty/learning-outcomes.php">http://research.kennesaw.edu/our/faculty/learning-outcomes.php</a> (note that this list is not exhaustive, and it is unlikely that all of these would be appropriate for any given research project).
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