

Ethical Reasoning, Behavior and Professionalism (SLO) – The graduate recognizes ethical issues, considers multiple points of view, and uses critical ethical reasoning to determine the appropriate behavior to follow. The graduate thus demonstrates a high level of integrity and a positive work ethic combined with a thorough understanding of the ethical implications and obligations associated with the practice of biomedical engineering.

Learning Indicators	Level 4	Level 3	Level 2	Level 1
	Master	Proficient	Apprentice	Novice
1.0 Ability to treat others with respect and does not discriminate on the basis gender, race, religion, sexual orientation, social class, ethnic background, physical disability, martial status, national origin or other attribute not related to academic or research performance	Shows all students, staff, faculty and other individuals courtesy and respect; Does not engage in behavior or conversations demeaning to another group or population; Does not show any favoritism to any person or persons based upon attributes not relevant to academic or research performance; Freely associates with a diverse group of other people and actively	Shows students, staff, faculty, and other individuals courtesy and respect; Seldom engages in behavior or conversations which might be demeaning to another group or population; Does not show favoritism to any person or persons based upon attributes other than academic or research performance; Able to listen to the opinions of others.	Shows reasonable courtesy to students, faculty, staff and other individuals although this may be influenced by the relative rank compared with the student; Sometimes engages in behavior/conversations demeaning to other groups or populations; May show some favoritism to others not based upon performance; Does not always listen to others	Does not always show others courtesy and respect; Often engages in behavior and conversations demeaning to other groups or populations; Shows definite favoritism based upon factors unrelated to performance; Often fails to listen to others' opinions.
2.0 Ability to articulate own ethical system and compare it with different perspectives and/or concepts	Able to articulate own ethical system in terms of core beliefs. Is able to compare and contrast these beliefs with more than 2 other ethical systems. Able to support own belief system with rational arguments.	Able to articulate own ethical system in terms of core beliefs. Is able to compare and contrast these beliefs with 1 or 2 other ethical systems. Can provide some support for own beliefs with rational argument	Able to describe some aspects of own ethical system but unable to compare or contrast these beliefs with any other ethical approaches. Is not able to provide support for own system with rational arguments	Unable to describe or justify own ethical system. Cannot describe any other ethical system with which to compare own beliefs
3.0 Recognizes ethical issues and applies ethical reasoning to the resolution of these issues	Recognize complex ethical issues when presented in ambiguous circumstances; Provides more than 2 possible resolutions. Is able to independently apply own ethical approach to the issue and can articulate several positive and negative consequences that could result from this application.	Recognize complex ethical issues when presented in ambiguous circumstances; Provides a possible resolution based upon an ethical system; Is able to independently apply own ethical system to the issue and articulate at least 1 positive and 1 negative consequence resulting from this application.	Has difficulty recognizing complex ethical issues when presented in an ambiguous context. Is able to provide a resolution to the basic issues in terms of own ethical system. Is able to apply some aspects of own ethical system to the situation but unable to discuss both positive and negative consequences to the proposed resolution.	Unable to recognize complex ethical issues when presented in an ambiguous context; Cannot provide a resolution to the issues presented and cannot apply own system to determine a resolution; Cannot articulate any specific consequences that result from a proposed resolution even when a possible resolution is provided.

<p>4.0 Understands the interplay between ethics, engineering and social structure within different cultures is able to adjust to different cultural perspectives</p>	<p>Student is familiar with more than 2 cultures in addition to his or her own and can describe how these cultures approach both engineering technology and ethical issues arising from the application of engineering solutions; Able to describe how different approaches to the same technology are required in different cultures and the ethical implications of these approaches: Student can formulate an ethical approach to problem-resolution or goal achievement in different cultural or social environments</p>	<p>Student is familiar with 1-2 cultures in addition to his or her own and can describe how these cultures approach both engineering technology and ethical issues arising from the application of engineering solutions; Able to describe how different approaches to the same technology are required in these cultures and the ethical implications of these approaches: Student can formulate an ethical approach to problem-resolution or goal achievement in at least 1 cultural or social environment different from his or her own.</p>	<p>Student is familiar with the concept that different cultures and/or social environments effect engineering technology solutions and applications, but cannot describe those effects or the ethical implications for another specific cultural or social environment; Student can develop new approaches taking cultural and/or social differences into account only with guidance.</p>	<p>Student is unfamiliar with the idea that different cultural and/or social environments alter how engineering solutions can be applied and is unaware of the ethical implications of those differences; Student believes that engineering is solely rational and should not be affected by social and/or cultural environment.</p>
<p>5.0 Ability to apply the ethical and professional standards of a biomedical engineer in obtaining, reporting and analyzing data</p>	<p>Independently follows appropriate procedures (safety, IRB, IACUC) in conducting research; Able to describe the basic policies and procedures regarding animal and human research, including the use of data derived from human subjects. Reports data fully and accurately to all relevant stakeholders; Never fabricates, falsifies or misrepresents authorship conclusions, data, evidence, or findings. All aspects of research (methods, data, analysis and conclusions) are reported fully and accurately in sufficient detail to allow trained researchers to replicate and confirm or deny the results</p>	<p>Independently follows appropriate procedures (safety, IRB, IACUC) in conducting research; Able to describe basic policies and procedures regarding animal and human research, including the use of data derived from human subjects Data reported with rare omission or inaccuracy to all relevant stakeholders; Never fabricates, falsifies or misrepresents authorship, data, evidence, conclusions or findings; Research is reported in sufficient detail, with minor omissions, that most trained researchers would be able to replicate the research and confirm or deny the results.</p>	<p>Under supervision, follows appropriate procedures (safety, IRB, IACUC) in conducting research; Aware of policies involving animal and human research but unable to describe procedures fully; Not fully aware of policies and procedures dealing with data from human subjects. Data reporting is incomplete and may miss some important stakeholders; Never fabricates, falsifies or misrepresents authorship, data, evidence, conclusions or findings; Research reports lack sufficient detail to allow even best trained researchers to replicate the research.</p>	<p>Unaware of policies and procedures covering animal and human subjects research; Unaware of policies and procedures concerning data from human subjects. As a result, might violate a standard procedure or protocol (safety, IRB, IACUC) if not carefully supervised. Not yet able to communicate research results in a manner consistent with scientific and/or engineering norms; May misrepresent authorship, data analysis or conclusions in a report.</p>

<p>6.0 Ability to assess situations in regards to conflicts of interest and other issues of trust and act in accordance with professional and ethical standards</p>	<p>Able to explain the meaning of conflict of interest; Always discloses any personal situation where a conflict of interest might arise; Does not plan or participate in research which might exploit research populations or institutional setting for personal gain; Does not release research results or any other information in an inappropriate manner.</p>	<p>Able to explain the meaning of conflict of interest; Usually discloses any personal situation where a conflict of interest might arise; Does not plan or participate in research which might exploit research populations or institutional settings for personal gain; On occasion, might release some non-critical information in an inappropriate manner.</p>	<p>Able to explain the meaning of conflict of interest but has difficulty applying the to personal situation; May not engage in complete disclosure through misunderstanding; Does not exploit research populations or institutional settings for personal gain; Might release information in an inappropriate manner.</p>	<p>Does not understand the meaning of conflict of interest and thus cannot apply it to our circumstances; Does not understand disclosure and may fail to disclose potential conflicts; Acts in a manner which indicates s/he might exploit research for personal gain; Disregards standards for appropriate release of information</p>
<p>7.0 Ability to demonstrate an understanding of the rights and limitations associated with intellectual property and confidentiality intellectual property agreements</p>	<p>Can define confidentiality and describe how confidentiality applies to human subjects research as well as to collaborative research; Can define intellectual property and is able to explain the basic policies and procedures associated with intellectual property rights; Demonstrates respect for intellectual property by consistently acknowledging the role of others in his/her research papers, reports and presentations</p>	<p>Can define confidentiality and partially describe how confidentiality applies to human subjects research as well as collaborative research; Can define intellectual property and can explain many of the policies and procedures associated with intellectual property rights; Demonstrates respect for intellectual property by acknowledging the contributions of others in his/her papers, reports and presentations</p>	<p>Can define confidentiality but has difficulty explaining how confidentiality applies to either human subjects or collaborative research; Can define intellectual property and explain some aspects of the policies and procedures associated with intellectual property rights; Does not always acknowledge the work of others is his/her papers, reports and presentations but will easily correct these oversights when prompted.</p>	<p>Definition of confidentiality incomplete or in error; Cannot fully explain how confidentiality applies to either human subject or collaborative research; Definition of intellectual property may be incomplete or in error; Cannot fully explain policies and procedures governing intellectual property rights; Fails consistently to acknowledge the contribution of others to his/her own papers, reports and presentations</p>