

OHSU – Biomedical Informatics Graduate Program - Core Competencies Mapped to Student Learning Outcome Measures for MS in Bioinformatics and Computational Biomedicine

Rubric

Intended Use: This rubric is a guide for students and their advisors and mentors to help track their progress through the BCB MS degree program. Measurements are a suggestion – feel free to add as you see fit!

Professional Knowledge and Skills	Meets expectations	Does not meet expectations	Possible Measurements
<p>SLO:</p> <ul style="list-style-type: none"> Apply knowledge of bioinformatics and computational biomedicine, and related disciplines, to solve problems in research, clinical and/or educational settings. 			
Knowledge base	Good understanding of the knowledge base related to biomedical informatics	Poor knowledge base related to biomedical informatics	<ul style="list-style-type: none"> Initial presentation of thesis proposal TAC (Thesis Advisory Committee) meetings – summary reports that describe student progress BMI 550— Parameter selection in the context of sequence alignment is a critical component of optimization and protocol standardization. Using sequence data from the wild mouse strain PWK, provide a naïve/brute-force analysis to set a threshold to determine the number of mismatches to allow in aligning the PWK to a reference (B6 mouse) using 100 base pair reads. Provide your code and a brief 1-2 page report summarizing your approach, assumptions, and limitations. After you have determined your mismatch threshold, please choose an appropriate aligner to align the provided data. Your written
Advancements	A clear understanding of the advancements in biomedical informatics	Lack of understanding of the advancements in biomedical informatics	
Specialization	Good knowledge of one or more specializations in biomedical informatics	Poor knowledge of one or more specializations in biomedical informatics	
Application of knowledge	Accurate and systematic application of existing knowledge to analyze the research problem	Inaccurate and inconsistent application of existing knowledge to analyze the research problem	

			<p>report should also include a discussion of the final alignment percentage.</p> <ul style="list-style-type: none"> • BMI 551—final data analytics project via Kaggle • BMI 552A/B—prepare a Specific Aims page, execute a team informatics project • BMI 553—lead a weekly paper discussion to develop and hone presentation skills • Course Midterms • Course Finals • Passing other larger course projects • Completing Thesis project
Professional Identity and Ethical Behavior	Meets expectations	Does not meet expectations	Possible Measurements
<p>SLO:</p> <ul style="list-style-type: none"> • Apply fundamental knowledge of ethics in research and implement solutions that assure confidentiality, security and integrity while maximizing the availability of data, information, and knowledge. 			
Academic integrity/Research ethics	Awareness of academic integrity and research ethics	Lack of awareness of academic integrity and research ethics	<ul style="list-style-type: none"> • Completed Thesis Project • Student initial presentation of thesis (proposal)
Manage data	Record data in prescribed format in timely, accurate and complete manner	Record experimental results with flaws in timeliness, accuracy and organizations	<ul style="list-style-type: none"> • TAC (Thesis Advisory Committee) meetings – reports • Course Midterms • Course Finals • BMI 535—reproduce, implement, debug, and document an established biomedical data analysis workflow, • BMI 546—slide presentation of hypothetical software system overview,

			<ul style="list-style-type: none"> BMI 565—submit written analysis of a high throughput dataset BMI 576-- prepare a 6-page, single-spaced paper on an ethics topic in informatics
Information Literacy	Meets expectations	Does not meet expectations	Possible Measurements
<p>SLO:</p> <ul style="list-style-type: none"> Engage in lifelong learning through: finding, interpreting and critically appraising professional literature in order to stay informed of advances in their chosen field; and connecting with the larger professional community through participating in conferences and societies. 			
Conference participation	Presenting at research conference	Attending Thursday research conference	<ul style="list-style-type: none"> Attend Thursday conference, submit abstract or poster to OHSU research week, join BioData Club, etc. BMI 553-- lead a weekly paper discussion to develop and hone presentation skills
Communication	Meets expectations	Does not meet expectations	Possible Measurements
<p>SLOs:</p> <ul style="list-style-type: none"> Effectively communicate in written and verbal form to both peers and non-experts. Communicate professionally, including during interactions with others, and while giving and receiving feedback. 			
Writing skills	Well written thesis and organization supports the objectives. Content is clear and coherent.	Poorly written and poorly organized, content unclear, lapses in coherence	<ul style="list-style-type: none"> Completed Thesis Project Student initial presentation of thesis (proposal) TAC (Thesis Advisory Committee) meetings – reports Course Midterms Course Finals Passing other larger course projects Pre-defense presentation Glossary of terms might be present at final presentation defense for non-expert
Speaking skills	Spoken explanations are clear and concise	Spoken explanations are not clear and concise	
Audience awareness	Audience knowledge was considered in presentation of topic	Audience knowledge was not considered in presentation of topic	
Response to feedback	Actively listen and respond appropriately to feedback	Respond inappropriately to feedback	
Integrating feedback	Documents and addresses feedback; seek out opportunities for feedback Example: Integrated feedback from pre-defense meeting to public defense.	Does not document or address feedback; does not seek out opportunities for feedback	

			<ul style="list-style-type: none"> • BMI 552A/B-- prepare a Specific Aims page, execute an informatics project • BMI 570-- prepare and revise a term paper on a chosen biomedical informatics topic and prepare a presentation on the same topic using inclusive language.
Teamwork	Meets expectations	Does not meet expectations	Possible Measurements
<p>SLO:</p> <ul style="list-style-type: none"> • Function as a productive member of a multidisciplinary collaborative team of biological or other scientists, informatics, information technology, clinical, administrative, and other experts. 			
Teamwork	Works collegially and effectively as team member/collaborator	Does not work collegially and effectively as team member/collaborator	<ul style="list-style-type: none"> • Team evaluations, feedback from sponsors, mentor/advisor, other peer, etc. • TAC (Thesis Advisory Committee) meetings – reports • BMI 512 - complete group project designed around a clinical informatics case scenario • BMI 537--10-page team paper that critiques a problem in healthcare quality management from the beginning of the problem to the development of a solution • BMI 552 A/B-- execute a collaborative informatics project • BMI 553-- lead a weekly paper discussion to develop and hone presentation skills • Course Midterms • Course Finals

			<ul style="list-style-type: none"> • Passing other larger course projects
Community Engagement, Social Justice and Equity	Meets expectations	Does not meet expectations	Possible Measurements
SLO: <ul style="list-style-type: none"> • Integrate the culture and diversity of a population when carrying out research and/or professional practice in informatics. 			
Empathy toward others	Demonstrates empathy toward the culture and diversity of all stakeholders	Treats others with respect; follows standard practices	<ul style="list-style-type: none"> • Completed Thesis Project • TAC (Thesis Advisory Committee) summary reports • Possible course alignment: BMI 570-- prepare and revise a term paper on a chosen biomedical informatics topic and prepare a presentation on the same topic using inclusive language • BMI 576—prepare a 6-page, single-spaced paper on an ethics topic in informatics • Course Midterms • Course Finals • Passing other larger course projects • Participation in two OHSU cultural diversity activities per year • Attend Thursday conference, submit to OHSU research week, join BioData Club, etc. (attend or present)
Patient Centered Care	Meets expectations	Does not meet expectations	Possible Measurements
SLO: <ul style="list-style-type: none"> • Demonstrate and promote informatics solutions that help to ensure patient safety within relevant clinical settings. 			
Safety Standards	Complies with safety and regulatory standards	Does not comply with safety and regulatory standards	<ul style="list-style-type: none"> • BMI 512-- complete group project designed around a clinical informatics case scenario

			<ul style="list-style-type: none">• BMI 576-- prepare a 6-page, single-spaced paper on an ethics topic in informatics• Passing other larger course projects
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Adapted from: Western University, Ontario, Canada: Learning Outcomes: Evolution of Assessment and Van Andel Institute