

Program-Level Assessment Plan

Program: Ph.D. Anatomy program	Degree Level (e.g., UG or GR certificate, UG major, master's program, doctoral program): Doctoral Program
Department: Center for Anatomical Science and Education	College/School: Medicine
Date (Month/Year): July 21, 2021	Primary Assessment Contact: john.martin@health.slu.edu

Note: Each cell in the table below will expand as needed to accommodate your responses.

#	Student Learning Outcomes	Curriculum Mapping	Assessment Methods	
			Artifacts of Student Learning (What)	Evaluation Process (How)
	<p>What do the program faculty expect all students to know or be able to do as a result of completing this program?</p> <p>Note: These should be measurable and manageable in number (typically 4-6 are sufficient).</p>	<p>In which courses will faculty intentionally work to foster some level of student development toward achievement of the outcome? Please clarify the level at which student development is expected in each course (e.g., introduced, developed, reinforced, achieved, etc.).</p>	<p>1. What artifacts of student learning will be used to determine if students have achieved this outcome?</p> <p>2. In which courses will these artifacts be collected?</p>	<p>1. What process will be used to evaluate the artifacts, and by whom?</p> <p>2. What tools(s) (e.g., a rubric) will be used in the process?</p> <p>Note: Please include any rubrics as part of the submitted plan documents.</p>
1	<p>KNOWLEDGE OF PRACTICE:</p> <p>1. Students will demonstrate competency in general knowledge of the core anatomical subjects (human gross anatomy, microscopic anatomy, neuroanatomy, embryology, and physiology).</p> <p>i) Describe prenatal human development with an emphasis on the correlation of normal embryological development with common</p>	<p>For SLO 1-i): Students enroll in ANAT-5200 Human Embryology during the Fall semester of the academic year. After completing this course students are expected to have mastered the conceptual basis of developmental anatomy through lectures, small group activities, a research article presentation, and examinations.</p> <p>For SLO 1-ii): Students enroll in ANAT-5100 Human Histology and Ultrastructure during the Fall semester of the academic year. After completing this course students are expected to recognize the</p>	<p>For SLO 1-i): 1. Direct measures of student performance include: 3 written (multiple choice question) examinations and an evaluation of a research article presentation. Indirect measures of student performance include participation in course discussions and small group (Peer Instruction) activities.</p> <p>2. Artifacts will be collected from 3 exams and 1 presentation of ANAT-5200 Human Embryology.</p>	<p>For SLO 1-i): 1. Summary reports of each of the 3 exams will be provided using assessment software (ExamSoft). The summary report will be used by the course director to evaluate student performance and individual question performance. Student performance on exam questions answered below a certain threshold, as determined by the course director, are assumed to be poor questions, and are removed from the exam. Summary reports of each research article presentation will be</p>

<p>congenital malformations</p> <p>ii) Identify and describe the microscopic and ultrastructural features of the human body with an emphasis on clinical application of the structure and function of tissues and organs</p> <p>iii) Describe the physiological principles and mechanisms of the human body with an emphasis on normal function and key homeostatic processes within cells, tissues, and organ systems</p> <p>iv) Identify and describe the normal structure and function of the human body with an emphasis on anatomical relationships and clinical significance</p> <p>v) Identify and describe the structure and function of the human nervous system with an emphasis on functional neuroanatomical systems, concepts of key neurobiological processes, and correlation of clinical presentation with nervous system lesions</p> <p>through participation in didactic, small group discussions, interactive laboratories, and</p>	<p>normal microscopic anatomy of human tissues, understand how cells associate to perform the functions for which they are specialized, understand how organized groups of cells (tissues) are arranged to form the organ systems of the body, correlate the cellular structure of organs to their specific functions, integrate histological knowledge with other anatomical science subjects (anatomy, embryology, neuroanatomy, and physiology) and recognize and use correct terminology to describe relationships, orientation, development, and movement of microanatomical structures within the human body through lectures, laboratories, small group activities, discussion sessions and examinations.</p> <p>For SLO 1-iii): Students enroll in ANAT-5400 Human Systems Physiology during the Fall semester of the academic year. After completing this course students are expected to describe normal cellular functions and how these are responsible for essential functions of the major human organ systems, delineate the normal interactions among organ systems that collectively promote homeostasis of the entire body, and identify normal compensatory mechanisms of organ systems to changing substrate availability, metabolic demand, and environmental stress through lectures, laboratories, small group activities, discussion sessions and examinations.</p> <p>For SLO 1-iv): Students enroll in ANAT-</p>	<p>For SLO 1-ii): 1. Direct measures of student performance include: 3 written (multiple choice questions and short answer questions) and laboratory (practical) examinations. Indirect measures of student performance include completion of laboratory worksheets, participation in course discussions and small group (Team Based Learning) activities.</p> <p>2. Artifacts will be collected from ANAT-5100 Human Histology and Ultrastructure</p> <p>For SLO 1-iii): 1. Direct measures of student performance include: 4 written (multiple choice questions) examinations. Indirect measures of student performance include participation in course discussions and small group (Team Based Learning) activities.</p> <p>2. Artifacts will be collected from ANAT-5400 Human Systems Physiology</p> <p>For SLO 1-iv): 1. Direct measures of student performance include: 4 written (multiple choice questions) examinations, 4 laboratory practical examinations and 4 quizzes. Indirect</p>	<p>used by the course direct to assess various presentation categories. Data and student course evaluations are reviewed by the individual course director, as well as with other course faculty and during faculty meetings. The CASE Director also monitors the process and works with the course director.</p> <p>2. ExamSoft summary reports and research article presentation assessment rubric form will be used in the process.</p> <p>For SLO 1-ii): 1. Summary reports of each of the 3 written (multiple choice) exams will be provided using assessment software (ExamSoft). The summary report will be used by the course director to evaluate student performance and individual question performance. Assessment of short answer questions will be completed by the course director. Laboratory practical exams are graded by the course director and individual questions and performance on each question is tallied. Student performance on exam questions answered below a certain threshold, as determined by the course director, are assumed to be poor questions, and are removed from the exam. Data and student course evaluations are reviewed by the individual course</p>
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<p>performance on written and laboratory examinations. These primary learning outcomes should better prepare the student for successful admission to medical, allied health professional, and/or advanced graduate programs.</p> <p>2) Students will demonstrate competency in 1) general knowledge of the application of current scientific literature, especially in areas representing gaps of knowledge, through framing hypotheses-driven experiments, independent reading and the completion of additional work; and 2) the application of designing and conducting experiments and to analyze and interpret data.</p>	<p>5000 Human Gross Anatomy during the Spring semester of the academic year. After completing this course students are expected to recognize and use correct anatomical terminology to describe the relationships, movement, and orientation of structures in the human body, describe the form and basic function of major anatomical systems of the human body, identify (name and locate) major anatomical structures as discussed in lecture and lab, correlate various imaging modalities (radiograph, CT, MRI) with structures discussed in lecture and lab, contribute to the education of yourself and your peers by actively engaging in laboratory and peer-teaching sessions, and identify and discuss clinical manifestations of anatomical problems through lectures, laboratories, small group activities and examinations.</p> <p>For SLO 1-v): Students enroll in ANAT-5300 Human Systems Neurobiology during the Spring semester of the academic year. After completing this course students are expected to demonstrate competency as evidenced by the ability to identify and describe the structure and function of the human nervous system with an emphasis on functional neuroanatomical systems, concepts of key neurobiological processes, and correlation of clinical presentation with nervous system lesions through participation in didactic lectures, small group discussions, and performance on written and laboratory examinations.</p>	<p>measures of student performance include participation in course dissections and participation in laboratory practice practical exams.</p> <p>2. Artifacts will be collected from ANAT-5000 Human Gross Anatomy</p> <p>For SLO 1-v): 1. Direct measures of student performance include: 6 written (multiple choice questions and short answer questions) examinations, 5 laboratory practical examinations and 6 quizzes. Indirect measures of student performance include participation in assigned dissections and participation in laboratory practice practical exams.</p> <p>2. Artifacts will be collected from ANAT-5300 Human Systems Neurobiology</p> <p>For SLO1-2) 1. Direct measures of student performance will include a grade in a final presentation in ANAT-5440 Basic Research Techniques in Anatomy, BBSG-510 Ethics for Research Scientists, BST-5000 Principles of Biostatistics, ANAT-6950 Special Studies for Exams and a rubric in ANAT-6990. Indirect measures of student performance include participation in course discussions, progress</p>	<p>director, as well as with other course faculty and during faculty meetings. The CASE Director also monitors the process and works with the course director.</p> <p>2. ExamSoft summary reports will be used in the process.</p> <p>For SLO 1-iii): 1. Summary reports of each of the 4 written exams will be provided using assessment software (ExamSoft). The summary report will be used by the course director to evaluate student performance and individual question performance. Student performance on exam questions answered below a certain threshold, as determined by the course director, are assumed to be poor questions, and are removed from the exam. Data and student course evaluations are reviewed by the individual course director, as well as with other course faculty and during faculty meetings. The CASE Director also monitors the process and works with the course director.</p> <p>2. ExamSoft summary reports will be used in the process.</p> <p>For SLO 1-iv): 1. Summary reports of each of the 4 written (multiple choice) exams will be provided using</p>
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	<p>For SLO 1-2) Students will enroll in ANAT-5440 Basic Research Techniques in Anatomy, BBSG-510 Ethics for Research Scientists, BST-5000 Principles of Biostatistics, ANAT-6950 Special Studies for Exams and ANAT-6990 Journal Club. After completing these courses students are expected to be able to understand fundamental techniques and instrumentation; understand principles underlying preparation of material for histological, histochemical, and ultrastructural examination and interpretation of results, critically evaluate current scientific knowledge through laboratory participation, assigned readings, discussions with principal investigator, and oral and written presentations.</p>	<p>meetings with faculty, and completion of laboratory experiences.</p> <p>2. Artifacts will be collected from ANAT-5440 Basic Research Techniques in Anatomy and in ANAT-6990 Journal Club.</p>	<p>assessment software (ExamSoft). The summary report will be used by the course director to evaluate student performance and individual question performance. Laboratory practical exams are graded by the course faculty and individual questions and performance on each question is tallied. Summary reports of each of the 4 quizzes will be provided using assessments in learning management system (Blackboard or Canvas). Student performance on exam questions answered below a certain threshold, as determined by the course director, are assumed to be poor questions, and are removed from the exam. Data and student course evaluations are reviewed by the individual course director, as well as with other course faculty and during faculty meetings. The CASE Director also monitors the process and works with the course director.</p> <p>2. ExamSoft summary reports will be used in the process. Assessments in learning management system (Blackboard or Canvas) will also be used in the process.</p> <p>For SLO 1-v): 1. Summary reports of each of the 6 written (multiple choice) exams will be provided using assessment software (ExamSoft). The summary report will be used by the</p>
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				<p>course director to evaluate student performance and individual question performance. Laboratory practical exams are graded by the course faculty and individual questions and performance on each question is tallied. Summary reports of each of the 6 quizzes will be provided using assessments in learning management system (Blackboard or Canvas). Student performance on exam questions answered below a certain threshold, as determined by the course director, are assumed to be poor questions, and are removed from the exam. Data and student course evaluations are reviewed by the individual course director, as well as with other course faculty and during faculty meetings. The CASE Director also monitors the process and works with the course director.</p> <p>2. ExamSoft summary reports will be used in the process. Assessments in learning management system (Blackboard or Canvas) will also be used in the process.</p> <p>For SLO 1-2) 1. Student performance data in ANAT-6900 journal club is graded. The oral defense of ANAT-6990 is graded by a 5-member committee. The information is used to determine whether the student is making progress in the program, to</p>
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				<p>identify weaknesses in their knowledge base that need to be remediated. Student performance data is discussed each semester at faculty meetings and recommendations are made to be discussed with each student during progress meetings.</p> <p>2. Summary reports of ANAT-6900 journal club rubric form will be used in the process.</p>
2	<p>SKILLS OF INQUIRY, CRITICAL THINKING AND PROBLEM SOLVING:</p> <p>Students will demonstrate: 1) the ability to gather data to verify the existence of a problem, conduct extended research/analysis into a problem/topic, evaluate the evidence, generate ideas for possible solutions and formulate a thesis based on analysis; and 2) the ability to read materials carefully and analyze them critically.</p>	<p>For SLO 2: Students will enroll in ANAT-5440 Basic Research Techniques in Anatomy, ANAT-6950 Special Studies for Exams and ANAT-6900 Journal Club, and ANAT-6990 Dissertation Research.</p>	<p>1. Direct measures of student performance will include a grade in a final presentation in ANAT-5440 Basic Research Techniques in Anatomy, a rubric in ANAT-6990 and a grade in ANAT-6990 Dissertation Research and a grade in the written doctoral qualifying exam.</p> <p>2. Artifacts will be collected and will include the following: 1) project reports from required and elective courses; 2) lab reports; 3) embedded exam questions in required and elective courses; and 4) dissertation research and written preliminary examination. Oral presentations from Journal Club, seminar, doctoral written examination, oral preliminary examination and dissertation defense will similarly be evaluated.</p>	<p>1. Student performance for written material and oral presentations is measured through use of grading rubrics that evaluate the following dimensions: 1) understanding of the problem to be solved; 2) statement of hypotheses made; 3) conceptual dimensions of reasoning; 4) empirical dimensions of reasoning; and 5) statement of thesis and inference drawn. Other evaluations include: participation in course discussions, progress meetings with faculty, and completion of laboratory experiences, and annual student reviews, and course evaluations.</p> <p>2. Student performance data is discussed each semester at faculty meetings and recommendations are made to be discussed with each student during progress meetings.</p>
3	<p>COMMUNICATION SKILLS:</p>	<p>For SLO 3: Students will enroll in ANAT-</p>	<p>1. Direct measures of student</p>	<p>1. Student performance of written</p>

<p>Students will demonstrate: 1) written communication skills with respect to clarity, use of appropriate grammar, syntax and vocabulary appropriate to the development of a NIH-style grant proposal; organizes research materials to support an original thesis; and, present ideas and arguments clearly, logically and with an appropriate balance of text and graphic materials; and 2) oral communication skills with respect to designing, organizing and presenting main points concisely and clearly; providing persuasive arguments, using data and information, that are appropriate for the audience and occasion; using language vocal variety, pronunciation and physical behaviors that support the verbal message for the audience and occasion; using visual aids appropriate for technical presentation, and ability to answer audience questions.</p>	<p>5440 Basic Research Techniques in Anatomy, ANAT-6950 Special Studies for Exams and ANAT-6900 Journal Club, and ANAT-6990 Dissertation Research.</p>	<p>performance will include a grade in a final presentation in ANAT-5440 Basic Research Techniques in Anatomy, a rubric in ANAT-6990 and a grade in ANAT-6990 Dissertation Research and a grade in the written doctoral qualifying exam.</p> <p>2. Artifacts will be collected and will include the following: grading rubrics of written presentations that Other evaluations include: participation in course discussions, progress meetings with faculty, and completion of laboratory experiences, annual student reviews and course evaluations.</p>	<p>communication will evaluate the following dimensions: 1) knowledge of the literature, 2) ability to formulate research questions as hypotheses to be tested, 3) relevance of the data to specific aims, 4) soundness of the conclusions drawn from the data, 5) treatment of alternative interpretations of the data, 6) completion of specific aims and the ability to foresee and address questions, and 7) appropriate use of research references and resources. Similarly, oral presentations will evaluate the following dimensions: 1) content, 2) use of appropriate data, 3) organization and clarity, 4) audio and visual support devices, and 5) appropriate verbal and physical support mechanisms.</p> <p>2. Student performance data is discussed each semester at faculty meetings and recommendations are made to be discussed with each student during progress meetings.</p>	
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Use of Assessment Data

1. How and when will analyzed data be used by program faculty to make changes in pedagogy, curriculum design, and/or assessment practices?

An Anatomy Graduate Oversight committee will meet every summer semester to implement changes based on the assessment data.

2. How and when will the program faculty evaluate the impact of assessment-informed changes made in previous years?

An Anatomy Graduate Oversight committee will meet every summer semester to evaluate the impact of assessment-informed changes.

Additional Questions

1. On what schedule/cycle will program faculty assess each of the program’s student learning outcomes? (Please note: It is not recommended to try to assess every outcome every year.)

Assessments will occur annually, assessing one outcome each year.

2. Describe how, and the extent to which, program faculty contributed to the development of this plan.

At the directive of the SOM Associate Dean for Faculty Affairs and Professional Development and the University Assessment Director the Anatomy Graduate Director (Dr. John Martin), Anatomy Graduate Associate Director (Dr. Dan Daly) and the Graduate Programs Coordinator (Patricia Anderson) meet and identified and implemented this plan.

IMPORTANT: Please remember to submit any rubrics or other assessment tools along with this plan.