TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER™
Graduate School *of* Biomedical Sciences

Guidelines and Requirements for Graduate Students Biomedical Sciences Concentration in Graduate Medical Sciences

I. Program of Study

The Graduate Medical Sciences concentration in Biomedical Sciences offers a Master of Science degree. All students are subject to the requirements listed in the Graduate School of Biomedical Sciences Catalog and Student Handbook of Texas Tech University Health Sciences Center published at the time of admission as well as concentration guidelines. (http://www.ttuhsc.edu/gsbs/catalogs.aspx; http://www.ttuhsc.edu/studentservices/documents/HSC_Institutional_Student_Handbook.pdf) New students are admitted prior to each fall term. Students are required to have a personal laptop computer which meets the general recommendations for laptop computer configurations compatible with the TTUHSC network and Sakai. More information regarding laptop configurations is available at http://www.ttuhsc.edu/gsbs/mspremedsci.aspx or from the graduate coordinator.

The Graduate Medical Science masters is a non-thesis degree designed to prepare students for medical or dental school, or teaching positions with an emphasis on anatomy, histology, biochemistry, and physiology. Students complete the first three blocks of the School of Medicine curriculum (including Clinically Oriented Anatomy, Biology of Cells and Tissues, and Structure and Function of Major Organ Systems) during the first year, then function as teaching assistants in these blocks during the second year. These courses are cross-listed with corresponding Graduate School of Biomedical Sciences courses. The concentration advisor will serve as the student's advisor during year one, and after an education project is selected, a faculty mentor will be appointed by the concentration advisor. An education project is required during the second year.

A. Prerequisites for Admission

1. A bachelor's degree or the equivalent from an accredited college or university.

2. Adequate preparation for the proposed field of graduate study. Students may have an undergraduate degree in any field, but a strong science background is encouraged, including the completion of an undergraduate biochemistry course. Applicants must have completed or will complete the prerequisites for medical school admission prior to matriculating into the program. While there is no minimum GPA requirement, the average undergraduate GPA of successful applicants is above 3.3.

3. Each student must take the Graduate Record Examination (General Test) and have the scores forwarded directly to our institution for evaluation. While the concentration does not have a minimum GRE score requirement, the average cumulative GRE score for admitted students is 310 (above 1200 on the old GRE scoring system).

   Occasionally the concentration will accept an MCAT score in lieu of the GRE requirement. The applicant must request MCAT in lieu of GRE and provide the graduate coordinator with his or her AAMC ID and Verification Code. The concentration will submit a waiver request to the Senior Associate Dean of the Graduate School of Biomedical Sciences, who has ultimate authority to approve or deny the request. The average MCAT scores for successful applicants is 29.

4. Two recent letters of recommendation (within 1 year) which must be from former faculty or administrators who are familiar with the scholastic abilities of the applicant.

5. Other admissions application requirements and deadline information are available on the Graduate School of Biomedical Sciences website: http://www.ttuhsc.edu/gsbs/prospective/

6. A personal interview may be requested by the concentration.

B. Graduate School Requirements - The Graduate School of Biomedical Sciences requires a minimum of 36 hours of graduate-level course work.

C. Concentration Mandates - Courses needed to fulfill the required number of hours are listed in Appendix 3.

D. Project – Students will design and carry out a medical education project (Appendix 5) under the direction of an appropriate faculty advisor (Appendix 2). The project will be designed according to the needs of these courses and matched to the interest of the student. Examples of a project might include self-directed learning units/sessions, or upgrading or creating educational materials as presented online. The student must choose a project prior to the beginning of the second year. Students will be given a list of possible projects or may choose a project of their own after consultation with the concentration advisor and faculty advisor (Appendix 6). The project must be approved by the concentration advisor. After the project is selected, the concentration coordinator and student will submit the Degree Plan and Admission to Candidacy to GSBS (Appendix 7).

   Subsequent alterations to the project for any reason will require approval of the concentration advisor.

   Second year students will present their project at Student Research Week and in a public seminar during the final Spring semester. The project and presentation will be evaluated by the concentration committee and faculty using Appendix 5**.** Successful completion of the project will be determined by the concentration committee. The project must be successfully completed to graduate.

E. Intent to Graduate – Each student is required to file the Statement of Intent to Graduate (Appendix 9) with the Graduate School of Biomedical Sciences office in the same semester

the student will graduate. Generally, this deadline is at the beginning of each semester. Students should check the GSBS website at: http://www.ttuhsc.edu/gsbs/current/.

II. Assessment of Graduate Student Progress (Appendix 1):

The graduate student checklist is the major tool for assessing graduate student progress through the degree program. It is the student's responsibility to ensure that all appropriate forms are signed and filed with the graduate coordinator according to deadlines. This checklist, Appendix 1, and the student's file will be reviewed every summer or as needed to ensure and assess student progress by the concentration committee (Appendix 8). In addition to meeting the concentration requirements detailed below, it is expected that the student will maintain above average ratings in all required assessment tools (Appendix 1). Failure to maintain these standards may result in the student being placed on academic probation or dismissed from the concentration.

The concentration committee has the responsibility for monitoring the progress of the graduate student and can recommend dismissal of the student to the Graduate School of Biomedical Sciences should the student fail to demonstrate adequate development and/or progress through the degree program.

III. Concentration Requirements

A. Satisfactory Academic Standing - Every student enrolled is required to maintain a high level of performance and to comply fully with policies of the institution and the graduate program. The Graduate School of Biomedical Sciences reserves the right to place on probation or to dismiss any graduate student who does not maintain satisfactory academic standing or who fails to conform to the regulations of the university. Every student is expected to maintain a high level of commitment to professional development in a variety of areas. If any aspect of a student's professional development (for example, attention to teaching responsibilities, appropriate growth toward development of critical thinking skills or appropriate progress toward project goals, etc.) is considered to be unsatisfactory by either the concentration committee or the student's faculty advisor (if one has been appointed), the student shall be so informed in writing, along with a description of the recommended corrective action and the period of time allowed for the corrective action to be taken. If the student fails to correct the deficiency, the committee may recommend dismissal of the student from the concentration.

   Students must attain a "B" or higher in all courses (Appendix 4). If the student attains a "C" in one of these courses, they will be required to retake the course the following year and attain at least a "B" grade. If the student makes less than a "C" in a course or less than a "B" in two or more courses during the first year, they will be dismissed from the concentration. To remain in good academic standing with the graduate school, students must maintain a GPA of 3.0 in each semester. If the student drops below a 3.0 for any semester, he or she will be placed on academic probation. If the student attains less than 3.0 in any subsequent semester, they will be dismissed from the concentration. Failure to meet appropriate deadlines outlined in the degree concentration checklist (Appendix 1) or unprofessional conduct by the student could result in the student being placed on Graduate

Medical Sciences concentration probation. Students who make a grade of D or F will automatically be dismissed.

In addition to concentration grade requirements, students will be evaluated for progress by the course directors in GGMS 5004 (Advanced Training in Anatomy), GGMS 5005 (Advanced Training in Histology), GGMS 5001 (Gross Anatomy),GGMS 5002 (Biology of Cells and Tissues), GMBP 5904 (Systems Physiology) using Appendix 10. Course directors will review this appendix with each student. This appendix will also be reviewed by the Concentration Advisor and student.

B. Course Waiver Procedure - Students requesting a waiver for a concentration-required course should follow these steps:

1. The student will make a written request to the concentration advisor outlining the course(s) to be waived, the reasons why the waiver is requested, and which, if any, previous graduate level courses addressed the same material as the waived course. The student must provide the concentration advisor with the relevant course syllabus.
2. The concentration advisor will forward the request to the concentration committee for consideration and request a vote on the waiver request.
3. The student will be notified of the voting results by email.

C. Grievances and Appeals

Student Appeals Policy. This policy applies to specific grievances arising from matters affecting students' academic standing and performance such as disputes concerning projects and project presentations. Appeals may be made only when alleged prejudicial, arbitrary or capricious action is involved. The burden of proof of unfair influence or action rests with the student.

A student wishing to appeal a decision or action first should discuss the matter with the faculty member or members involved. If the student is not satisfied with the outcome of this discussion, the student should contact the concentration advisor. This contact, like that with the faculty members, normally is informal, and the concentration advisor may take whatever action he or she deems advisable in attempting to resolve the issue. All parties involved should make every effort to resolve the issue without going beyond this level. The concentration advisor may consult with either the concentration committee (excluding the Dean of the Graduate School of Biomedical Sciences) or an *ad hoc* committee of graduate faculty from the concentration (when the appeal is of an action taken by the concentration committee or a substantial proportion of its elected members) for advice regarding actions in an appeal. If the student still is not satisfied following these meetings and discussions, the student may make a formal appeal to the Dean for the Graduate School of Biomedical Sciences. The appeal shall be processed according to the rules of the Graduate School of Biomedical Sciences in effect at the time it is filed with the dean.

D. Leave of Absence

A Leave of Absence may be requested by submitting a written request to the Graduate Advisor at the beginning of the semester and must specify the reason for the request.

The Graduate School of Biomedical Sciences has a Leave of Absence policy (GSBS Catalog, Page 13), which states:

"Any student who fails to register for three consecutive semesters (12 months) and who does not have an official leave of absence from study is subject to review for readmission by the standards in effect at the time of reconsideration. Official leave of absence, which is granted by the GSBS Office upon recommendation of the graduate advisor or advisory committee Chair, may be granted only in cases of serious medical conditions and other exceptional reasons. Normally, leaves of absence will not exceed one year. Leaves of absence do not extend the maximum time allowed for completion of the degree."

Students granted a Leave of Absence must submit written confirmation to the Graduate Advisor of their intent to return to the concentration one month prior to their intended return. A student who returns from a Leave of Absence must ensure that all obligations associated with their return, including timely registration for the appropriate semester, are met.

Requests to extend a Leave of Absence beyond one year must also be submitted in writing to the Graduate Advisor and will only be granted under unusual circumstances. In addition, the student must have been in good academic standing at the time of the original request. If a Leave of Absence request is denied and the student does not continue in the curriculum, the student will be considered to have withdrawn from the program. The student may reapply for admission to the concentration but will be subject to the same requirements and deadlines as other prospective students.

E. Additional Specific Information

1. Registration - A student must be registered for a minimum of 1 hour in the semester that he/she intends to graduate. Students will register for a minimum 9 hours for each long semester (fall and spring) and may register for up to 6 hours for the summer session.

2. There is no requirement for a foreign language or a minor.

3. Appendix 11 lists all courses offered by the Graduate Medical Sciences Concentration.

4. Degree plans are subject to change as the concentration guidelines are revised.

IV. Concentration Constitution and Policies

A. Concentration Committee Composition and Responsibilities

The concentration committee consists of four members. Three are elected by graduate faculty members, who then serve for terms of three years. The Dean of the Graduate School of Biomedical Sciences serves as an ex officio member (voting only in the case of a tie). The chair of the committee is appointed by the Dean of the Graduate School of Biomedical Sciences and acts as the concentration advisor. The concentration advisor appoints an associate

concentration director from the elected three faculty members. The associate concentration advisor fulfills advisor duties in the absence of the Graduate Advisor. Specific functions of the concentration committee are to: 1) oversee the general governance of the concentration, 2) review and accept students into the concentration, 3) oversee content of the required courses, 4) ensure that course directors are providing the students with a syllabus that clearly outlines course contents and grading policies, 5) annually evaluate student progress, and 6) conduct the 7-year GSBS graduate faculty review. The concentration committee will serve as the student's advisory committee.

The concentration advisor will serve as one of the concentration's two representatives to the TTUHSC Graduate Council. The second representative to Graduate Council will be elected by the concentration faculty. If a second representative is not elected, the associate advisor will serve as the representative.

B. Proposing Changes to the Guidelines of the Concentration in Graduate Medical Sciences

The general governance of the concentration including changes to the guidelines is the primary responsibility of the concentration committee. However, any member of the Graduate Medical Sciences graduate faculty has the right to recommend a change in the Graduate Medical Sciences concentration by presenting a written document to the concentration advisor. The concentration advisor will then call together the concentration committee to discuss the proposed change. All changes must be allowed within the policies of the Graduate Bylaws of the Graduate School of Biomedical Sciences (TTUHSC). The concentration committee must then make a recommendation (in favor of, or opposed to, the suggestion) to the concentration advisor for a final decision. The concentration advisor will then be responsible for formally revising the guidelines.

Guidelines approved by the Graduate Medical Sciences Concentration Committee on April 9, 2013

Appendix 1: Graduate Medical Sciences Checklist

Graduate Medical Sciences Concentration Student Checklist

GA Approval	Requirements	Appendix	Date Completed
	Introduction to Concentration Advisor and Graduate Coordinator to Receive Guidelines and Checklist	1	
	Reviewed Sample Curriculum with Concentration Advisor	3	
	Fall Semester Year 1		
	GGMS 5001 Gross Anatomy	10	
	GGMS 5002 Biology of Cells & Tissues	10	
	Spring Semester Year 1		
	GMBP 5904 Systems Physiology		
	Choose One: GGMS 5110 Surgical Gross Anatomy OR	10	
	GGMS 5006 Advanced Dissection Skills		
	Meet with Faculty Regarding Educational Project		
	Select an Educational Project: _____	6	
	Submit Degree Program to GSBS	7	
	Summer Semester Year 1		
	Optional Elective _____		
	Fall Semester Year 2		
	FERPA Training		
	GGMS 5004 Advanced Training in Anatomy	10	
	GGMS 5005 Advanced Training in Histology	10	
	GGMS 7000 Research (3 Hours) Begin Project	10	
	Spring Semester Year 2		
	Submit Intent to Graduate to GSBS	9	
	GGMS 5310 Educational Project in Biomedical Sciences (Complete Project)	5	
	GCMB 6320 Advanced Cell Biology	10	
	GGMS 7000 (2 Hours) - Complete Project	10	
	GSBS 5101 Responsible Conduct of Research		
	See checklist for graduation deadlines from the GSBS website.		

Appendix 2: Graduate Faculty of the Concentration

Professors

Jim Hutson, Ph.D.
Betsy Jones Ed.D.
Vaughan Lee, Ph.D.
John Pelley, Ph.D.
Thomas Pressley, Ph.D.
Brandt Schneider, Ph.D.

Associate Professors

Greg Brower, D.V.M., Ph.D.
Jannette Dufour, Ph.D.
Cheryl Erwin, J.D., Ph.D.
Lisa Popp, Ph.D.
Annette Sobel, Ph.D.
Daniel Webster, Ph.D.

Assistant Professors

Graduate Committee:

Vaughan Lee	Permanent Position as Concentration Advisor
Jannette Dufour	Present - Aug 31, 2017
John Pelley	Present – Aug. 31, 2018
Daniel Webster	Associate Advisor, Present - Aug. 31, 2019
Brandt Schneider	Permanent ex officio Member
Anthony Hewetson	Advisory Position (Non-Voting)

Graduate Council:

Vaughan Lee	Permanent Position as Graduate Advisor
Daniel Webster	September 1, 2016 - August 31, 2018

Appendix 3: Sample Graduate Medical Sciences Concentration Curriculum

Curriculum
Students will take courses in the anatomical and physiological sciences and in modern instructional methods and design, and will participate in the teaching mission of the medical school as teaching assistants.

Year 1

Fall Term		
GGMS 5001	Gross Anatomy (Clinically Oriented Anatomy)	6 hrs
GGMS 5002	Biology of Cells & Tissues	5 hrs
		11 credit hours

Spring Term:		
GPHY 5904	Systems Physiology (Structure & Function of Major Organ Systems)	9 hr
GGMS 5110	Surgical Gross Anatomy	1 hrs
		10 credit hours

Year 2

Fall Term:		
GGMS 5004	Advanced Training in Anatomy	3 hrs
GGMS 5005	Advanced Training in Histology	3 hrs
GGMS 7000	Research (Begin Project)	3 hrs
		9 credit hours

Spring Term:		
GGMS 5310	Educational Project in Biomedical Sciences (Complete Project)	3 hrs
GCMB 6320	Advanced Cell Biology	3 hrs
GGMS 7000	Research (Complete Project)	2 hrs
GSBS 5101	Responsible Conduct of Research	1 hr
		9 credit hours

Appendix 4: Grading Scale

Grading Scale for the following courses:

GGMS 5002 Biology of Cells and Tissues
GGMS 5001 Gross Anatomy
GPHY 5904 Major Organ Systems

A, B, C, D, or F cumulative score as graded on the written and practical exams.

87.00 and Above = A
75.00 – 86.99 = B
70.00 – 74.99 = C
65.00 – 69.99 = D
64.99 and Below = F

Refer to syllabus for grading scale in all other courses.

Appendix 5: Project Presentation Evaluation

Graduate Medical Sciences Project/Presentation Evaluation Form

Date: _____ **Evaluator:** _____
Student: _____

Mark the appropriate box for each statement

The Project	**Not Acceptable**	**Acceptable**	**Very Good**	**Exceptional**	**Not Applicable**
The background was logical, clear and led to an important project plan.					
The project plan was presented with associated specific steps.					
The methods were appropriately used and presented clearly.					
The results were presented clearly; and were analyzed and interpreted properly using statistics where appropriate.					
The discussion included appropriate alternatives.					
A conclusion is offered that is logical and fits the project; and emphasized the overall significance.					
The Presentation					
The presentation was clearly organized.					
The slides were readable, illustrate concept and data, and provide smooth transition.					
The student was engaging, enthusiastic, and spoke clearly.					
Questions were answered in a confident and knowledgeable fashion.					
The student was able to accept criticism and suggestions readily, and was able to defend their presentation when appropriate.					

Comments:

Appendix 6: Graduate Medical Sciences Project Advisor Agreement

To: The Concentration Advisor of Graduate Medical Sciences

From: The Graduate Student _____

Subject: Selection of the MS Graduate Medical Sciences Project Advisor

Date: _____

The two parties who have signed below mutually agree to begin a formal Graduate Student-Major Advisor relationship directed toward the goal of earning a M.S. degree for the student.

Student's Signature _____

Project Advisor (Please Print) _____

Project Advisor's Signature _____

Project Name _____

_____

Concentration Approval:

_____

Concentration Advisor's Signature _____

Appendix 7: Master's Degree Plan
Must Complete Online: http://www.ttuhsc.edu/gsbs/documents/forms/ms_degree_plan.pdf

TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER
Graduate School *of* Biomedical Sciences™

Print Form

MASTER'S DEGREE PLAN & APPLICATION FOR ADMISSION TO CANDIDACY

After admission to a degree program, every applicant for the master's degree is required to complete this form and submit it to the Graduate School of Biomedical Sciences for approval as early as possible and no later than **six months prior to proposed date of graduation.**

Date | **Official Use Only** Catalog: Deadline:

Name | TTUHSC ID (R#)

Program/Concentration | Expected Year & Semester of Graduation

☐ Thesis ☐ Non-Thesis ☐ Fall ☐ Spring ☐ Summer

Thesis Committee (3 minimum)

1) Chair
2)
3)
4)

Thesis topic (if known at this time)

Coursework (prefix and number as it appears in catalog, i.e. GPHY6000. Please do not list course title. Courses with multiple enrollments should be designated with hours in parenthesis, i.e., GBCH6000 (6).

Major (Thesis) 24 hours minimum plus 6 hours thesis		Major (non-thesis) 36 hours minimum		Transfer Course Number*	GSBS Equivalent Course Number*

*Please attach a separate document noting the Transfer Course, Institution & Year Taken. In order for transfer courses to be entered on the TTUHSC transcript, courses must be given the GSBS equivalent number. Please provide official transcript for all transfer courses. No more than 6 hours of a 30 hour program, or 9 hours of a 36 hour program may be transfer hours.

Approval of this form by the GSBS Assistant Dean merely indicates that the proposed program is acceptable; it carries no assurance of the applicant's attainment of a degree. Changes to this program may be made using the **Changes to Degree Plan Form** available on the GSBS Website. Conditions for approval for admission to candidacy must be met before the proposed semester of graduation.

Graduate Advisor or Committee Chair (typed/printed) | Signature of Graduate Advisor or Committee Chair

☐ Approved ☐ Conditional Approval

GSBS Assistant Dean | Date

Forward this form to the GSBS, 2B106, Mail Stop 6206

Appendix 8: Annual Graduate Student Progress Review

Student Name: _____

Concentration Committee Review Date: _____

Comments: _____

_____

_____

_____

_____

Concentration Advisor Signature: _____

Appendix 9: Intent to Graduate
Must Complete Online: http://www.ttuhsc.edu/gsbs/documents/forms/intentgraduate.pdf

Print Form

TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER
Graduate School *of* Biomedical Sciences™

STATEMENT OF INTENTION TO GRADUATE

Please complete all information and return to the Graduate School of Biomedical Sciences Office (2B106 or mail stop 6206). You will also need to complete the electronic Intent to Graduate and Student Regalia Form on the Student Services website at: http://www.ttuhsc.edu/studentservices/commencement/default.aspx.

Full Name for Diploma
Please include any credentials you have previously earned that you would like printed (e.g. Sheldon Cooper, PhD)

Program/Concentration

Semester of Graduation (e.g. Spring 09)

Degree Sought ☐ MS ☐ PhD ☐ MD/PhD

DIPLOMA

☐ Will pick up at the Commencement Ceremony*
☐ Will pick up from the Registrars Office*
☐ Please mail it to me

*Any diplomas not picked up are shredded after 6 weeks.

Diploma Mailing Address

Will you be attending

GSBS Convocation ceremony in May? ☐ Yes ☐ No
TTUHSC Commencement ceremony in the May? ☐ Yes ☐ No

NOTE: You must order Regalia to attend these events

If you would like your name to be printed in either the Convocation or Commencement Programs, you must have a release of information form on file with GSBS. You can do this using the form located on the GSBS website.

OFFICIAL TITLE FORM

Title pages for students who write theses or dissertations will be prepared using information supplied on this form. If this is your first submission of title, or if changes are necessary, fill in below and have your chairperson sign.

Defense Date (tentative)

Official title - Print or type (do not use symbols, formulas, etc.)

Committee members (indicate chair)

APPROVALS

Committee Chair Date

Forward this form to the GSBS Office, 2B106, Mail Stop 6206

Appendix 10: Course Directors Evaluation of Student Progress–Graduate Medical Sciences

Date: _____
Student: _____
Course: _____
Evaluator: _____

Mark the appropriate box for each statement. (In order for a student to pass the course, student must receive a grade of 3/Average or above in the Overall Progress category.)

	Outstanding 5	Above Average 4	Average 3	Below Average 2	Inadequate 1	Not Applicable
Preparedness for Lecture/Lab/Prelab Sessions						
Active Engagement						
General Communication Skills						
General Comprehension of the Material						
Extra Items: Study Sessions, Generation of Practice Exams, etc. (as applicable)						
Overall Student Progress (Overall progress score is an overall reflection of the subscores but not necessarily a numerical average of the subscores.)						

Comments:

Date Reviewed by Concentration Advisor _____

Appendix 11: Concentration Courses Offered

GGMS Courses:

5001. Gross Anatomy (V1-9). A highly integrated introductory course of anatomical study (including human dissection) which embodies the gross morphology of the body and coordinates it with clinical, developmental, and microscopic aspects of the human body. Enrollment limited to students admitted to the Pre-Medical Sciences concentration. (F)

5002. Biology of Cells and Tissues (V1-9). Biology of Cells and Tissues is designed to provide students with fundamental information concerning the traditional areas of biochemistry, histology, and cell biology. The principles presented in the course will proceed from molecules to cells and then to tissues integrating structure and function. Enrollment is limited to students admitted to the Pre-Medical Sciences M.S. concentration. (F)

5004. Advanced Training in Anatomy (V1-6). Students will participate in the gross anatomy laboratories as teaching assistants and attend all pre-laboratory meetings in preparation for the laboratory sessions. The students will also assist in preparing the practical exams. Prerequisites include successful completion of the first year course work in Graduate Medical Sciences. Enrollment limited to students admitted to the Pre-Medical Sciences M.S. concentration. (F)

5005. Advanced Training in Histology (V1-6). Students will participate in the histology laboratories as teaching assistants and attend all pre-laboratory meetings in preparation for the laboratory sessions. The students will also assist in preparing the practical exams. Prerequisites include successful completion of the first year course work in Graduate Medical Sciences. Enrollment limited to students admitted to the Pre-Medical Sciences M.S. concentration. (F)

5006. Advanced Dissection Skills (V1-6). Students will review and conduct specialized dissections in the Anatomy Laboratory. The student will learn and practice advanced dissections skills designed to prepare specific teaching materials to demonstrate anatomical structures in different body regions. Prerequisites include successful completion of the first year course work in Graduate Medical Sciences.

5007. Advanced Training in Ultrasound (V1-3). The overall goal is to show how to utilize ultrasound imaging to visualize and teach advanced topics in anatomy and physiology. Prerequisites: successful completion of GGMS 5001 and GGMS 5004.

5099. Topics in Graduate Medical Sciences (V1-6). Specific areas in Graduate Medical Sciences or related areas not normally included in other courses. May be repeated for credit with change of content. (F)

5110. Surgical Gross Anatomy (1:1:0). Introduction and overview to surgical approaches to different regions of the human body from a clinical perspective. Students will observe and assist surgeons with surgical dissections of cadavers. The experience in surgical anatomy will provide students with a relevant correlation of anatomy to applied surgical procedures. Enrollment limited to students admitted to Graduate Medical Sciences M.S. concentration and successful completion of GGMS 5001 Gross Anatomy course. (F)

5115. Introduction to Functional Neuroanatomy (1:1:0). Students will learn to identify external and internal structures of the central nervous system (CNS: brain and spinal cord) and associated vasculature. They will be able to describe the symptoms due to lesions in specific brain and spinal cord lesions. Prerequisites: good academic standing, GGMS 5001. (F)

5120. How People Learn: Theory and Practice (1:1:0). The overall goal is to show how maximize learning skill in the health sciences with an emphasis on medical education. Individual differences in learning style will be used as examples of the application of Deliberate Practice to increase cognitive skills. Concepts such as the Growth Mindset and memory consolidation will provide a basis for understanding the universal application of concept mapping and question analysis as methods that maximize return on investment of learning time.

5310. Educational Project in Biomedical Sciences (3:0:3). Students will design and carry out an educational project related to topics in GMED 5001 or GMED 5002. The project will be designed according to the needs of these courses and matched to the interest of the student. Projects might include self-directed learning units/sessions, or upgrading or creation of educational materials as presented on Sakai. Enrollment limited to students admitted to the Graduate Medical Sciences M.S. concentration. (F)

6101. Seminar (1:1:0). (F)

7000. Research (V1-9). (F)

GMBP Courses:

5904. Systems Physiology (9:4:0). This course provides the student with a basic understanding of the organ systems of the human body. Their functions, regulation and interactions are emphasized. (F)