

Course Identifier: ANTR 350

Course Name: Human Gross Anatomy & Structural Biology

Department of Radiology, Division of Human Anatomy
Colleges of Human and Osteopathic Medicine

Primary contact name, phone number, and email

Michael G. Koot, PhD 353-5269 kootmich@msu.edu

Faculty and Staff Involved in Developing and Offering the Course

NAME	MSU Affiliation	PROJECT ROLE
Michael G. Koot, PhD	Department of Radiology	Course Director, Instructor
Lindsey L. Jenny, PhD	Department of Radiology	Instructor
Maureen Schaefer, PhD	Department of Radiology	Instructor

This is a team-taught course that utilizes several different lecturers.

Type of Course:

FULLY ONLINE (no required face to face component)

BLENDED/HYBRID (some face to face time is replaced by online learning)

TECHNOLOGY-ENHANCED FACE-TO-FACE (a face-to-face course which uses technology for teaching and learning in an innovative way)

Semester(s) offered in 2012-2013 and number of students enrolled:

SEMESTER	# STUDENTS
FALL 2012	433
SPRING 2013	503

I. Course Description

Human gross anatomy (ANTR 350) is a comprehensive lecture-based survey course with selected clinical case scenarios. It is a required course for students who desire to enroll in Michigan State University's College of Nursing and for students with dietetics and nutritional sciences majors. It is also a popular course for human biology majors who plan to apply to medical school, or are interested in other allied healthcare fields, such as physical therapy, dentistry, or physician's assistant programs. Nearly 500 students enroll each semester in this dynamic blended course that utilizes multiple modes of content presentation and assessment. Additionally, an innovative and award-winning virtual cadaver dissection website, and customized digital course materials allow students many types of practice modules.

The main goals of this course are for the student to:

- 1) Learn the key structures of the human integumentary, skeletal, muscular, nervous, cardiovascular, respiratory, lymphatic, endocrine, digestive, urinary, and reproductive organ systems.
- 2) Learn the basic elements of the language of medicine (medical morphemes) derived from Greek and Latin origins.
- 3) Learn how to visualize important anatomic spatial relationships in his or her head.
- 4) Learn how to describe gross anatomical structure with precision and clarity.
- 5) Be introduced to clinical case scenarios (clinical case correlates).

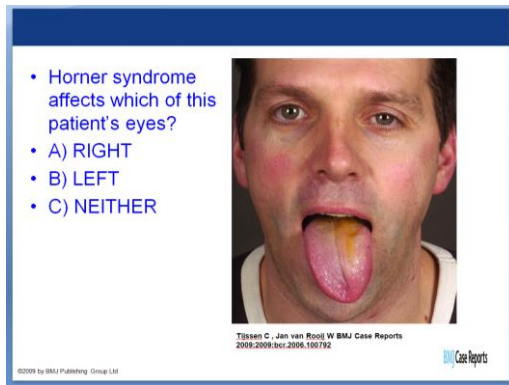
Approximately 25% of the course content is available through recorded lectures that substitute for in-class lectures. Some of the topics covered by recorded lectures are then followed up with a face-to-face lecture session that first reviews the major concepts first presented in the recorded lecture. Clinical case correlates in which abnormal or pathological anatomy is involved with a medical condition or disease provide students with concrete examples of why the knowledge of normal anatomy is important. In order to identify abnormal anatomy, students first need to know normal anatomy. The clinical case correlates associated with the anatomy of a certain body region are then presented to the class by the instructor. Student engagement and participation is often attempted through the use of clickers. There are many different modes of practice self-assessment that students can utilize, most of which are enhanced by technology. Student performance is assessed by five in-class unit exams, and ten "quizzes", three of which are submitted on Desire2Learn as essentially open book homework assignments. The remaining seven are "virtual lab quizzes" that require the student to identify anatomical structures on images from a virtual cadaver website in a lab practical format.

II. Learning and Interaction Goals of the Course or Technology-enhanced Innovation

An innovative feature of this course is the blended approach of the course in which recorded lectures for select topics replace live lecture time in order to allow students to learn the core concepts at their own pace. This also allows for lecture time to be utilized for applying basic anatomical knowledge to the application of clinical case correlates. The use of recorded lectures in this course allows students to be first introduced to the fundamental anatomy of a given organ system or body region. This allows the instructor to then use class time to clarify, emphasize, and review the more complex anatomy of the

specific organ system. Lecture time is also used to informally gauge student knowledge by using clicker questions which reward participation. Based on the results of these quizzes, the instructor can then revisit a certain concept that requires reinforcement. In face-to-face lectures, the instructor can also focus on relevant clinical case correlates that apply to the anatomy of a specific organ system or body region.

A specific example of this blended approach is the teaching of the autonomic nervous system (ANS). A series of recorded lectures using Adobe Presenter first covers the fundamentals of the anatomy of the ANS. This is followed by a face-to-face lecture in which the instructor reviews the main goals of the ANS, and then compares and contrasts the anatomy of the two main divisions – sympathetic and parasympathetic. The instructor also takes time to address some of the concepts of the ANS that students typically find most challenging. The instructor then finishes the lecture by discussing several different



clinical conditions that affect the ANS, Horner and Raynaud syndromes. These conditions were not covered in the recorded lectures. The instructor proceeds to list the symptoms of each of these conditions. Based on their knowledge of the ANS, the students are asked to work with their neighbors in an attempt to diagnose the cause of the condition and to respond with their clickers. The instructor follows the clicker questions with the correct answer and an explanation of the abnormal anatomy that causes each

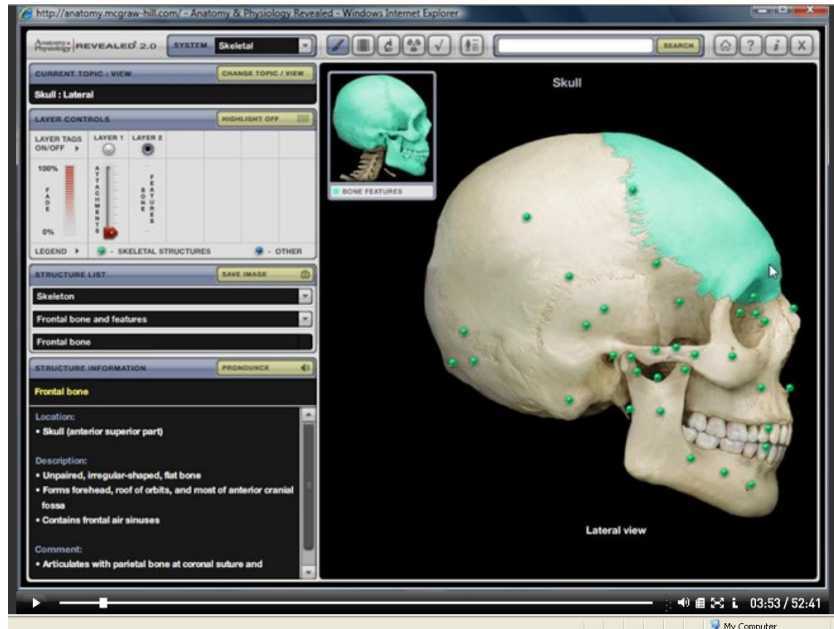
condition. These clinical case correlates are also reinforced in lecture by showing YouTube video clips of people affected by these ANS dysfunctions.

Horner Syndrome	Raynaud Syndrome
<p><u>Symptoms</u></p> <ul style="list-style-type: none"> • Drooping superior eyelid – <i>ptosis</i> – loss of Sympathetic innervation to superior tarsal m. of upper eyelid • Absence of sweating – <i>anhidrosis</i> – loss of Sympathetic innervation to sweat glands • Constriction of pupil – <i>miosis</i> – Unopposed Parasympathetic innervation to pupil constrictor mm. • Redness & increased temperature of skin - <i>flushing</i> – Blood vessels vasodilate due to lack of Sympathetic innervation 	<ul style="list-style-type: none"> • <u>Symptoms</u> • Decrease in blood flow causes <i>blanching</i> (loss of red hue of normal skin pigment) distal to the location of vascular constriction <p>• Based on the symptoms and your ANS knowledge, Raynaud syndrome is triggered by an exaggerated response of the _____ division.</p> <ul style="list-style-type: none"> • A) Parasympathetic • B) Sympathetic • C) Both

Another reason for incorporating recorded lectures into this course is effectiveness. In anatomy there are several instances in which a recorded lecture of high quality can be a more successful method for presenting students with new information than the traditional face-to-face lecture. A specific example from this course is the anatomy of the skull. The skull is a three-dimensional structure, thus when it is converted into two-dimensional images the result is numerous possible views. Teaching this lecture face-to-face in a large lecture hall can be difficult, as the instructor is required to constantly flip from one slide to the next to properly locate a specific bone or bony process. This lecture often feels like a show and tell

presentation, “here is the frontal, notice how it articulates with the parietal”, and a lot of time is typically wasted navigating to the appropriate slide with the correct orientation to view a specific bone.

In Fall 2010, I decided to record the content of the skull lecture using McGraw Hill’s Anatomy and Physiology Revealed (APR) 3.0 website and Camtasia. APR is an interactive website that allows for the virtual dissection of a digitized cadaver. I narrated the lecture as I led the student through each bone of the skull and its relevant anatomy by using the dynamic images of APR in which structures could be highlighted. The video was posted well ahead of the day used for the skull lecture, and I informed students that the lecture I would deliver on the skull in class would be better understood if they first watched my recorded lecture on the basic anatomy of the skull. This allowed me to then spend more time in live lecture on interesting clinical case correlates and applications of the anatomy of the skull, and to reinforce some of the more important topics I had first covered in the recorded lecture. The recording also allowed students to pause and replay certain segments. This lecture is presented early in the semester and is also a good introduction to the students of the utility of the APR website as a learning resource.



Another mode of content delivery is provided for students through recorded supplementary materials that are available for students to watch from anywhere and at any time there is an internet connection. Faculty members have used the APR website and Camtasia to record supplemental lectures for material that can be difficult to simply present with PowerPoint slides. Using APR, the instructor is able to present students with a virtual dissection experience as if they were in the gross anatomy lab working with the instructor on a dissected cadaver. Examples of these tutorial videos include a review of muscles of the abdominal and back regions and upper limb muscle dissections. Other supplemental resources are narrated video tutorials that cover the bones and joints of certain body regions, and were created by a former honors option student. The student used bones and joint models to explain the anatomy of the skull, vertebral column, and the upper and lower limbs. For each of the course’s five units, there is also a recorded exam review session available for students to watch. These recorded sessions replace live lecture review sessions that in past years were held before each exam. One of the advantages of the recorded reviews is that all students have access to them and do not have to worry if they could not attend the live review session because of a schedule conflict, which is always a concern in large classes.

III. Points of Interest and Innovation

One of the highlights of this course is the integration of the Anatomy and Physiology Revealed (APR) 3.0 website. This website allows for an interactive dissection on a virtual cadaver. The use of this website by students is important for learning the anatomical and spatial relationships of different structures since this course does not have a lab component. Instead, their lab experience in ANTR 350 is virtual. When students register to use APR they enter a customized code that I have provided for them that correlates to a list of specific ANTR 350 course objectives which they are responsible for knowing. This custom list was selected from the thousands of possible APR objectives and becomes the default view for any of the APR modules. This customization is an incredible asset, and it makes the question of “what structures in APR do I need to know” easy to answer. A student is responsible for knowing everything on the customized list. At any time if their curiosity needs to be satisfied, they can simply make one click and view all the objectives in the complete version of the APR website.

APR allows student to move through different tissue layers to reveal underlying structures. Structures can be highlighted and the student can read more about the specific anatomy of highlighted structures, or a muscle can be clicked to allow a student to view an animated video of the muscle in action. There is also a search feature that will show a specific objective in every available view. There are several different modules that contain animations, radiological images, and an extensive self-quizzing component. The self-quiz feature is incredibly useful because it will only generate quiz questions based on the customized ANTR 350 objective list. The format of the quiz can be designed by the student to test themselves on specific body regions and systems, and at different levels of difficulty.

Screenshot of dissection mode in APR



Screenshot of self-quiz mode in APR



McGraw Hill’s digital content website “Connect” is used in this course for student assessment and practice purposes. This website accompanies the textbook used in ANTR 350 and when students purchase access to Connect they also gain access to the APR website and a sophisticated eBook version of the course textbook that can record individual student notes. Connect houses the seven virtual lab (VL) quizzes which require the student to identify anatomical structures on static images which come from the

APR website. These VL quizzes are an important part of the course because they reproduce the lab practical component of a traditional gross anatomy course that would otherwise not be possible in this lecture course. To create virtual labs for this course, specific images and questions from the APR database are selected and imported as an assignment into the Connect website. Importantly, each question and answer choice is fully editable by the instructor and can be customized to ensure that it fits with the learning objectives and terminology specifically used in our ANTR 350 course. Question pooling is utilized in order to generate a random VL for each student. Each of the six VL quizzes has a set time limit to replicate a typical, traditional lab practical experience. However, to encourage students to use the APR website to study for each VL, a student can take each VL twice and his/her highest score is recorded.

This course has incorporated VL quizzes in its curriculum since Fall 2009. The APR website existed prior to this time period and historically it was listed as a recommended learning resource, but I quickly realized that very few students were using it because it was not tied to any specific assignments. The students that did use APR enjoyed it and told me it was a great learning resource. With this feedback in mind, I created VL quizzes in order to be able to assess the student's knowledge of specific anatomical structures and spatial relationships more effectively than by simply using grayscale textbook figures on each unit's written exam. I also believed that another important benefit of implementing VL quizzes would be that students would be motivated to use the APR website since it would now be tied to actual course performance. I also thought as they studied for the different virtual labs by using the APR website, they would realize its potential as a learning resource tool for the entire course, not just the next scheduled virtual lab.

Based on a survey that I conducted at the end of the Fall 2012 semester, my goal of "steering" students towards the APR website appears to be working. 85% of respondents report using the APR website always or usually, 85% agreed that the APR website was an effective learning tool, and 86% agreed the VL quizzes were an effective method of assessing their knowledge of spatial relationships and specific anatomical structures. Furthermore, they comment that APR is fun to use! (Complete results of these questions are displayed in Section V.)

The Connect website is also a critical resource for student practice. Each of the five units has multiple practice assignments that have been created by course lecturers totaling at least 100 practice questions per unit. These practice questions have been drawn from the large Connect database of available assessment questions that accompany the anatomy textbook used in this course, or from the APR database of quiz questions. Most importantly, all of these Connect questions are then edited by course faculty to make the questions and answer choices fit the specific ANTR 350 learning objectives, or new questions can be easily imported or designed in Connect. There are a variety of Connect question

Screenshot of Virtual Lab Quiz Question

6. Which muscle is highlighted?



- A) sternocleidomastoid
- B) trapezius
- C) pectoralis major
- D) deltoid
- E) biceps brachii

< Previous

Next >

Done

Show/Hide Answers

styles: multiple choice, multiple select, true/false, fill-in-the blank, matching, and drag-and-drop questions which require students to correctly label anatomical figures. Many of these practice questions involve the use of figures or photos from the APR website which allows students to be able to practice these types of visual identification questions. These modules are all for practice and are not graded, thus after each practice assessment students can receive instant feedback if they get the question incorrect, or can select from available options such as “show hint”, or “reference the eBook” which opens the specific section in the eBook that would help them answer the question. They can also click on “ask the instructor” and compose an email with a screenshot of the question they need help on. The instructor can then send a response to either the individual student, or the whole class. This is useful in the event there is an error with one of these practice questions. For students who do not embrace digital learning technology, there are also practice questions at the end of each section in their lecture coursepack.

Other modes of self-assessment are used in an effort to engage students in this large lecture course. During traditional face-to-face lectures, clickers are used to allow students to work with their neighbors in an attempt to answer questions on lecture content or on clinical case scenarios. These questions are not graded, but reward participation that can earn students bonus points at the end of the semester. In recorded lectures which use Adobe Presenter or Camtasia, quiz questions are embedded throughout lectures in an effort to focus their attention and allow them an opportunity to check their understanding of certain topics before moving on to the next section of the lecture. This Spring semester Desire2Learn is being used in ANTR 350. One of the features that is being utilized are self-assessment quizzes. In the example below, a student has the chance to complete a self-assessment exercise complete with detailed feedback for each incorrect answer after first watching a recorded lecture on the meninges of the brain and spinal cord.

The screenshot displays a self-assessment quiz titled "Meninges Self-Assessment" within a Desire2Learn course interface for "SS13-ANTR-350 - Human Gross Anatomy - BOTH SECTIONS". The interface includes a "Content Map" on the left, a "Print" button, and navigation buttons for "Previous", "Next", and "Exit". The quiz consists of five multiple-choice questions:

- sub-arachnoid space of the cranial cavity
- sub-arachnoid space of the spinal cavity
- central canal of the spinal cord
- subdural space of the cranial cavity
- the ventricles

Below the questions, a feedback message states: "All correct except for subdural space of the cranial cavity." Below that, "Question 5" is shown, asking: "What is the name of the procedure used to withdraw CSF for analysis?" The selected answer is "Subdural puncture", which is marked as incorrect with a feedback message: "Not correct. No such space or procedure." The other options for Question 5 are "Spinal block", "Epidural block", and "Lumbar spinal puncture (spinal tap)".

Course organization and effective communication are important in any class, especially a large class with over 400 hundred students, and also critical in order to make all of the learning resources readily apparent and available for student use. Below is a screenshot of the student home page for ANTR 350 on D2L. At the top of a page is the very useful updates banner where students are alerted to new discussion forum posts or emails and upcoming quizzes that need to be completed. The heading content browser is for all content and makes it easier for students to find the course materials or information they need, because it is organized by different modules. The calendar feature on the right is also an easy way to alert students to upcoming deadlines and a direct link can be created between the calendar and content. For example, on the screenshot above, if a student clicks on the link for “Feb 7: Watch recorded upper limb bones lecture”, he or she would go directly to this recorded lecture. Other features of the course that are key for communication and organization are several, short recorded tutorial videos that are posted to D2L to answer common student questions, such as: “How do I run a grade report?”, or “How do I register my clicker?”. I have also created short video tutorials that show the students how to navigate the Connect website, and a basic overview of how to use the different components of the APR website. All lecture content-related questions are directed to D2L discussions forum, which are created for each of the five units. The principle behind the use of the discussion forums is that a question worth answering for one student is worth answering for all 500.

The screenshot displays the D2L course home page for SS13-ANTR-350 - Human Gross Anatomy - BOTH SECTIONS. The page is organized into several sections:

- Updates:** Shows 1 Quizzes Not Attempted.
- Content Browser:** Lists course materials under "Nervous System: Dr. Koot" and "Home". The main section is "Brain and Meninges: Recorded Lecture", which includes:
 - Meninges: Part 1 Recorded Lecture (26 min)
 - Meninges Self-Assessment
 - Brain: Part 2 Recorded Lecture (29 min)
 - Brain and Meninges PPT
 - Brain and Meninges PPT MARKUP
- News:** Features a post titled "Exam #1 Scoring Info and Review" posted on Feb 4, 2013 at 8:55 PM. The post includes the following text:

1a) Exam #1 average was 58 / 80 or 72.5%.

This average matches the performance on the first exam from previous semesters.

If you received an email with your specific exam feedback that means you earned 4/4 easy points for this exam.

If you received an email from me that read "You did NOT earn your 4 easy points because you bubbled in your name or PID incorrectly" this means that you have not earned the 4 easy points for this exam.

The easy points are NOT bonus points, they are their own gradebook category and should not be added to your exam total.

Exam #1 scores have been posted to D2L. The Axial Bones VL and LearnSmart CH 1 scores from Connect will be posted to D2L this week, for now you should be able to see these scores on the Connect website. If you completed the Tissues SSM on time that score should be posted. I am still working on how to get the LATE Tissues SSM
- Calendar:** Shows the current date as Thursday, February 7, 2013. It includes a calendar grid for February 2013 and a list of upcoming events:
 - FEB 7 All Day:** Have you made your Cranial Nerve notecards yet?
 - FEB 7 5:00 PM:** NO LIVE Lecture: Watch Upper Limb Bones and Joints recorded lectures
 - FEB 8 8:00 PM:** Cranial Nerve Homework - Due
 - FEB 9 8:00 PM:** LATE Cranial Nerve Homework - Due

IV. Accessibility

Lectures that are recorded with Adobe Presenter allow the instructor's notes to be visible in one of the viewing modes. This can be a benefit for students with auditory difficulties. Recorded lectures can also be paused and played numerous times which can be important for students who have difficulties taking notes or experience problems with dyslexia which is the number one learning disability on campus. I have been the course director for ANTR 350 since Spring 2006 and there have been many RCPD students enrolled in ANTR 350 over these years. This course accommodates all of these students' individual testing accommodations for each of the five exams. Additionally, the virtual lab quizzes which have specific time limits utilize advanced settings in the Connect website to allow each student his/her required time extension. Typically these assignments only display one question at a time, but in the past this has been modified to allow a student with a visual disability to view all of the questions at the same time which made it easier for the student to successfully complete the assignments.

V. Evidence of Effectiveness with Students

Below are results of a student survey from Fall 2012 about the Connect and APR virtual dissection website used in this course to enhance their learning through multiple modes of practice assignments.

The APR website was an effective tool for learning /studying the ANTR 350 course objectives.		
<u>Response</u>	<u>#</u>	<u>%</u>
<i>Strongly agree</i>	192	56
<i>Agree</i>	101	29
<i>Neutral</i>	30	9
<i>Disagree</i>	13	4
<i>Strongly disagree</i>	8	2

How frequently do you use the APR website?		
<u>Response</u>	<u>#</u>	<u>%</u>
<i>Never</i>	14	4
<i>Rarely</i>	38	11
<i>Usually</i>	113	33
<i>Always</i>	180	52

The Virtual Lab quizzes were an effective tool for assessing your knowledge of the spatial relationships and structures covered in each virtual lab.		
<u>Response</u>	<u>#</u>	<u>%</u>
<i>Strongly agree</i>	155	45
<i>Agree</i>	143	41
<i>Neutral</i>	29	8
<i>Disagree</i>	14	4
<i>Strongly disagree</i>	1	0.3

The CONNECT website was an effective tool for learning/studying the ANTR 350 course objectives.		
<u>Response</u>	<u>#</u>	<u>%</u>
<i>Strongly agree</i>	120	35
<i>Agree</i>	144	42
<i>Neutral</i>	63	18
<i>Disagree</i>	9	3
<i>Strongly disagree</i>	4	1

Below are student comments from a survey completed at the end of the Fall 2011 semester. These answers are in response to an open-ended question that asked them to comment on the technological components used in this course, such as APR, Connect, and recorded lectures. As you can see, students love the ability to quiz themselves on APR and the Connect website.

“I found the recorded lectures to be very useful and did best on the exams that offered the most recorded lectures. For me, it helps to hear things multiple times in order for them to make complete sense. Sometimes it is hard to catch everything in lecture so I found it really nice to be able to pause, rewind, and re-listen to the lectures.”

“I really enjoyed the incorporation of the recorded lectures with the traditional lecture style. I thought they were balanced well and would've liked to have had more recorded lectures posted.”

“I OFTEN used the APR website to get myself orientated even if there was no VL assignment. I am so happy that I will still have part of my year subscription when I start med school next June - I will be using it then as well!”

“APR was the most comprehensive tool a professor has ever provided me.”

“I really enjoyed using the APR website and feel that it really helped me to grasp the locations of more body parts through using it. I also really like how it correlated directly with the VLs that were posted to Connect.”

“APR is an incredibly useful program and should remain a component of this course.”

“This class has so many aspects that promote learning. I thought it was wonderful. I believe that the way this class is structured is really great. One of my most favorite aspects of the class was the ability to use the CONNECT questions and APR. It allowed me to focus on "real" images without having to travel to the Anatomy Help Room.

The virtual lab assessments are very helpful along with all of the Connect modules and the APR website.”

“The technology aspect of the course was a great tool to help me understand the material. I really thought that the APR tool was really helpful in showing us where the body parts are located on an actual body.”

On the next page is a screenshot of MSU SIRS results for Fall 2012, ANTR 350, section 001. In general the course is well received by students and they recognize the overall excellent organization of this course and the willingness of its course faculty to help students.

Instructor course sections

SIRS SUMMARY REPORT FOR: ANTR 350 001 (TERM: FS12)

- Instructor: MICHAEL G KOOT
- Number of students enrolled: 329
- Number of replies: 229
- Date generated: 2/7/2013 5:34:56 PM

[Show Form Questions](#) (opens in a new window)

SOCT

In addition to results from SIRS Online surveys, the SOCT survey (Students' Opinion of Courses and Teaching) results are also available. SOCT is a brief, optional survey that students can take. Students, faculty and the MSU community can view results from this survey at soct.msu.edu.

	Superior	Above average	Average	Below average	Inferior	OMIT	MEAN	STD. Deviation
INSTRUCTION	1	2	3	4	5	6	7	8
1 The instructor's enthusiasm when presenting course material.	61.4%	28.9%	8.77%	0.87%	0%	0%	1.49	0.69
2 The instructor's interest in teaching.	63.2%	28.7%	7.52%	0.44%	0%	0.87%	1.45	0.65
3 The instructor's use of examples or personal experiences to help get points across in class.	51.5%	32.1%	14.5%	1.76%	0%	0.43%	1.66	0.78
4 The instructor's concern with whether the students learned the material.	56.5%	29.8%	10.0%	2.63%	0.87%	0%	1.61	0.83
5 Your interest in learning the course materials.	49.1%	37.2%	10.9%	2.19%	0.43%	0%	1.67	0.78
6 Your general attentiveness in class.	33.7%	35.0%	26.3%	3.94%	0.87%	0%	2.03	0.91
7 The course as an intellectual challenge.	41.2%	43.4%	14.0%	0.87%	0.43%	0%	1.75	0.75
8 Improvement in your competence in this area due to this course.	47.5%	39.4%	11.2%	1.34%	0.44%	2.19%	1.67	0.75
9 The instructor's encouragement to students to express opinions.	33.3%	37.2%	27.6%	1.75%	0%	0%	1.97	0.82
10 The instructor's receptiveness to new ideas and others' viewpoints.	36.4%	39.0%	22.3%	2.19%	0%	0%	1.90	0.81

COMPOSITE PROFILE FACTORS

Category	Items	Mean	Standard Deviation
Instructor Involvement (KOOT,MICHAEL G)	Items 1-4	1.55	0.75
Student Interest (Non-Instructor)	Items 5-8	1.78	0.82
Student Instructor Interaction (KOOT,MICHAEL G)	Items 9-12	1.97	0.88
Course Demands (Non-Instructor)	Items 13-16	2.10	0.98
Course Demands (KOOT,MICHAEL G)	Items 13-16	2.29	1.04
Course Organization (Non-Instructor)	Items 17-20	1.84	0.90
Course Organization (KOOT,MICHAEL G)	Items 17-20	1.79	0.88

VI. Plans for Sustainability

The enrollment for this course continues to be high and there is nothing to indicate that it will decrease in the near future, as national experts point to a potential shortage of nurses and physicians in the upcoming years. There has been discussion of making this a fully online course (with the exception that all exams would be proctored on campus). Such a format may work well as a summer course. In the meantime, the course will continue to move forward as a blended course, with an expected increase every year in the amount of in-class lecture time that gets replaced by recorded lectures posted to ANGEL. I believe that the ideal model for this course may be the “flipped class”. Students would first learn core material through a recorded lecture, and then an in-class lecture would review key points and move to a discussion of relevant clinical correlates. In terms of course improvement, additions to the course are constantly being added and I would like to incorporate more of the recorded lectures that use the APR website in the framework of the course, similar to the skull lecture. The switch from ANGEL to Desire2Learn has helped students and faculty be able to access the content through a mobile platform on their smartphone or tablet devices, and has also reduced some of the problems with different web browsers not being supported by ANGEL.