

LSC Use Only Proposal No:	UWUCC Use Only Proposal No: 11-89	Senate Action Date: App-3/20/12
LSC Action Date:	UWUCC Action Date: App-3/6/12	

**Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee**

Contact Person(s) Shundong Bi & Joseph Duchamp	Email Address sbi@iup.edu & jduchamp@iup.edu
Proposing Department/Unit Biology	Phone 724-357-2352

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

**1. Course Proposals (check all that apply)**

<input checked="" type="checkbox"/> New Course	<input type="checkbox"/> Course Prefix Change	<input type="checkbox"/> Course Deletion
<input type="checkbox"/> Course Revision	<input type="checkbox"/> Course Number and/or Title Change	<input type="checkbox"/> Catalog Description Change

Current course prefix, number and full title: \_\_\_\_\_  
Proposed course prefix, number and full title, if changing: BIOL 402/502 Advanced Human Anatomy

**2. Liberal Studies Course Designations, as appropriate**  
This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

<input type="checkbox"/> Learning Skills	<input type="checkbox"/> Knowledge Area	<input type="checkbox"/> Global and Multicultural Awareness	<input type="checkbox"/> Writing Across the Curriculum (W Course)
<input type="checkbox"/> Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)			
<input type="checkbox"/> Global Citizenship	<input type="checkbox"/> Information Literacy	<input type="checkbox"/> Oral Communication	
<input type="checkbox"/> Quantitative Reasoning	<input type="checkbox"/> Scientific Literacy	<input type="checkbox"/> Technological Literacy	

**3. Other Designations, as appropriate**

<input type="checkbox"/> Honors College Course	<input type="checkbox"/> Other: (e.g. Women's Studies, Pan African)
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**4. Program Proposals**

<input type="checkbox"/> Catalog Description Change	<input type="checkbox"/> Program Revision	<input type="checkbox"/> Program Title Change	<input type="checkbox"/> New Track
<input type="checkbox"/> New Degree Program	<input type="checkbox"/> New Minor Program	<input type="checkbox"/> Liberal Studies Requirement Changes	<input type="checkbox"/> Other

Current program name: \_\_\_\_\_  
Proposed program name, if changing: \_\_\_\_\_

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)	<i>Joseph Duchamp</i>	12/9/11
Department Chairperson(s)	<i>Shundong Bi</i>	12/9/11
College Curriculum Committee Chair	<i>Anne Kende</i>	1/17/11
College Dean	<i>Joseph Duchamp</i>	1/30/12
Director of Liberal Studies (as needed)		
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate		
UWUCC Co-Chairs	<i>Gail S. Schmitt</i>	3/6/12

**Liberal Studies**  
 Received  
 JAN 9 1 2012

*original to SGSR 3/7/12*

## **Part II. Description of Curricular Change**

### **I. Catalog Description**

#### **BIOL 402/502 Advanced Human Anatomy**

**3c-3l-4cr**

**Prerequisite:** BIOL 111 – 112 or permission of instructor; not open to students who have successfully completed BIOL 150; not open to students that have completed less than 60 credit hours.

An intensive study of the gross anatomical structures and their functions within the human body. Explores the organization and integration of the human body on a region by region basis. For each region of the body, students will observe all structures within that region simultaneously. This approach allows students to appreciate the integration of different biological systems within the body. Laboratory sessions will center on regional cadaver dissection by groups of students to appreciate 3-dimensional anatomical relationships.

### **II. Course Outcomes**

As a result of taking this course, students should be able to

- 1) Recognize visible tissues and organs within the human body
- 2) Explain the relationships between multiple tissue types and organs within different regions of the body
- 3) Relate the structural characteristics of tissues to the function of each organ
- 4) Relate the organization of organs within the body to the body's developmental process
- 5) Apply knowledge of anatomical topics to selected clinical examples presented in class

### **III. Detailed Course Outline**

#### **Lecture Topics (Academic Hours)**

##### **A. Introduction (3 hours)**

1. Organization of the body
2. Tissue types
3. Anatomical terminology

##### **B. Posterior Torso (5 hours)**

1. Overview
2. Vertebral column and spinal cord
3. Peripheral nervous system
4. Muscles and vasculature

##### **C. Upper limbs (5 hours)**

- C. Upper limbs (5 hours)**
- 1. Overview**
  - 2. Muscles of shoulder and arm**
  - 3. Brachial plexus and blood supply**
  - 4. Muscles of the forearm**
  - 5. Hand**

**Exam 1 (1 hour)**

- D. Thorax (5 hours)**
- 1. Overview**
  - 2. Heart**
  - 3. Respiratory**
  - 4. Vasculature and nerve innervations**

- E. Abdomen (8 hours)**
- 1. Muscles of the thoracic and abdominal wall**
  - 2. Pelvic diaphragm and perineum**
  - 3. Gastrointestinal tract**
  - 4. Accessory digestive organs**
  - 5. Renal system**
  - 6. Male Reproductive System**
  - 7. Female Reproductive System**

**Exam 2 (1 hour)**

- F. Lower Limbs (4 hours)**
- 1. Overview**
  - 2. Lumbosacral plexus and vascular supply of the lower limb**
  - 3. Thigh**
  - 4. Leg**
  - 5. Joints**
  - 6. Peripheral nerves injuries**

- G. Head and Neck (9 hours)**
- 1. Skull**
  - 2. Muscles of facial expression**
  - 3. Muscles of mastication and the tongue**
  - 4. Brain**
  - 5. Cranial nerves**
  - 6. Ear and eye**
  - 7. Pharynx and Larynx**

**H. Graduate Student Research Presentations (1 hour)**

**Final exam (During Final Exam Week)**

## **Laboratory:**

**Laboratories will consist of hands-on dissection of a human cadaver and studying and reviewing structures using models, skeletons, and isolated bones. The goal is to allow students to review the typical anatomy of a region using models, skeletons, and isolated bones while observing the integration of the multiple systems within a region. The students are then challenged the following week with the dissection of that region within a human cadaver. With an expectation of structures and locations, the students explore one unique configuration of these structures in an actual human body. Applying their knowledge to an actual human cadaver helps develop problem solving skills, team work, and helps bridge the gap between the ideal representations of models and the actual configuration of the human body.**

### **Tentative Laboratory Topics:**

**Week 1 Skeletal System**

**Week 2 Back and Posterior Neck**

**Week 3 Upper Appendages and Girdles**

**Week 4 Posterior Lower Appendages and Girdles**

**Week 5 Hands and Feet**

**Week 6 Review**

**Week 7 Practical Exam I**

**Week 8 Thorax and Anterior Neck**

**Week 9 Abdomen and Pelvis**

**Week 10 Anterior Lower Appendages**

**Week 11 Anterior Head**

**Week 12 Brain**

**Week 13 Review**

**Week 14 Practical Exam II**

#### **IV. Evaluation Methods**

**Grading and Policies:** For lecture, there will be three written exams. The three written exams will be a combination of multiple-choice, short answer, and essay questions (20% each).

There will also be two laboratory practical exams (15% each). Questions will involve the anatomical features on dissected human specimens, skeletons, isolated bones, models, slides and/or diagrams. Also, groups of 2-4 students will be expected to present up to 4 separate summaries of their dissection activities during lab (10%).

Final course grades will be based on: 1) Three lecture examinations (60%); 2) Two lab practical exams (30%); and 3) Lab presentations of dissection activities (10%).

**Makeup Exams:** Any examination missed must be made up within one week upon the presentation of an official absence excuse slip. Makeup exams may differ from original exam in form, content, and /or level of difficulty. You will not be allowed to miss and make-up more than one exam.

#### **V. Grading Scale:**

Final grades will be assigned according to the following scale: 90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, 0-59%=F.

#### **VI. Undergraduate Course Attendance Policy**

The university expects all students to attend class. While attendance is not required, students are strongly encouraged to regularly attend both lecture and laboratory.

#### **VII. Required Textbooks, Supplemental Books and Readings**

1. Jekins, D. B. (2009) *Hollinshead's functional anatomy of the limbs and back*. St. Louis: Saunders.
2. Tank, P.W. (2009) *Grant's Dissector*. Philadelphia: Lippincott Williams & Wilkins
3. Netter, F. H. (2010) *Atlas of Human Anatomy*. St. Louis: Saunders

#### **VIII. Special Resource Requirements**

A box of disposable (latex or nitrile) gloves for their personal use.

## **IX. Bibliography**

- Gunderman, R.B. and P.K. Wilson. (2005) *Exploring the Human Interior: The Roles of Cadaver Dissection and Radiologic Imaging in Teaching Anatomy*. Academic Medicine, 80: 745-749.**
- Heylings, D.J.A. (2002), *Anatomy 1999–2000: the curriculum, who teaches it and how?* Medical Education, 36: 702–710.**
- Moore, K. and A. Dalley. (2005). *Clinically Oriented Anatomy*. Fifth edition. Philadelphia: Lippincott Williams & Wilkins.**
- Winkelmann, A. (2007) *Anatomical dissection as a teaching method in medical school: a review of the evidence*. Medical Education, 41: 15–22.**
- Granger N. 2004. *Dissection laboratory is vital to medical gross anatomy education*. Anatomical Record 281B: 6–8.**
- McLachlan J. 2004. *New path for teaching anatomy: living anatomy and medical imaging vs. dissection*. Anatomical Record 281B: 4–5.**
- Pawlina W, Lachman N. 2004. *Dissection in learning and teaching gross anatomy: rebuttal to McLachlan*. Anatomical Record 281B: 9–11.**

## **Appendix 1**

**Graduate Credit:** Students taking the course for graduate credit will be required to complete additional work. This includes 1) answer additional essay questions on lecture exams; 2) write and present an anatomy-related review paper. The topics for the review paper may include anatomical characteristics, health and disease, or human evolution. The format for the review paper will correspond to that of a journal publication, and will be described during class. The corresponding presentation will occur during a scheduled lecture, or during an arranged time outside of class.

Final course grades will be based on: 1) Three lecture examinations (45%); 2) Research paper and presentation (15%); 3) Two lab practical exams (30%); and 4) Four lab presentation of dissection activities (10%).

Final grades will be assigned according to the following scale: 90-100%=A, 80-89%=B, 70-79%=C, 0-69%=F.

## **Course Analysis Questionnaire**

### **Section A: Details of the Course**

- A1 The Advanced Human Anatomy is designed for upper-division undergraduates in biology and related disciplines along with graduate students in biology. It is especially well suited toward Premedical, Preveterinary, or other medically related pursuits. Additionally, this course would be suitable for those interested in teaching courses in human anatomy as part of their profession. This upper level biology course will provide students with a broad context and skill set that will lay the ground work for professional training in a medically related field.
- A2 This course does not require changes in the content of existing courses or requirements of any program.
- A3 This course was offered during spring 2011 as BIOL 481 Advanced Human Anatomy on a trial basis. There were 24 students enrolled in this course.
- A4 The course is a dual-level course.
- A5 The course may not be taken for variable credit.
- A6 Below are examples of similar courses offered by other institutions. When proposing the course, we were advised that we probably would not be allowed to offer a 5 credit hour course that would allow for the depth of content to be equivalent to the other institutions listed. However, the proposed course would be our best approximation and a great improvement over the depth of content currently available.

Stony Brook University, Department of Anatomical Sciences. **HBA 461/561/540** – Regional Human Anatomy. 5 credits.

<http://www.anat.stonybrook.edu/SHTM/index.html>

Ohio State University, College of Biomedical Science. **AME 712** - Human Anatomy. 12 credits. <http://biomed.osu.edu/ame/11575.cfm>

Southern Illinois University, Department of Physiology. **PHLS 401-A & B**- Advanced Human Anatomy w/Lab. 5 credits.

<http://www.siued.edu/physiology/index.php?action=courses>

Colorado State University, Department of Biomedical Sciences. **BMS 301**. Human Gross Anatomy. 5 credits. <http://www.cvmb.colostate.edu/bms/bs301.htm>

- A7 The content and skills of the proposed course are often recommended or required by medically related professional schools such as: dental, pharmacy, physical therapy, physician's assistant, and veterinary medicine.

### **Section B: Interdisciplinary Implications**

- B1 This course will be taught by instructors from the Biology Department only.
- B2 There is no overlap between the content of this course and the content of courses offered by other departments.



**B3 This course will not be cross-listed with any other department.**

**Section C: Implementation**

- C1 No new faculty member is required to teach this course. Dr. Shundong Bi was the lecture professor and Dr. Joseph Duchamp was the laboratory professor for the trial period of spring 2011. The proposed course will account for 6 hours of equated work load (3 lecture and 3 laboratory). With the introduction of this course, one lower-enrolled biology elective will not be offered. Since BIOL 402 is likely to be in demand, this course offering should increase the overall enrollment in the department; it quickly filled to 24 students when offered as a special topics course during spring 2011. Biology electives are generally 5 hours of load. The remaining one hour of load will be added to Dr. Bi's load, which has frequently been at 22-23 hours per year. Hence, the course will allow more efficient use of faculty load. In addition, Pre-medical Biology students and Natural Science majors often take BIOL 150 Human Anatomy as a free elective (it does not count as a biology elective), and by shifting Pre-medical Biology and Natural Science majors from BIOL 150 to BIOL 402, it may make more seats available in BIOL 150 for Nursing majors.**
- C2 Space is available for lecture and lab in Weyandt Hall. Equipment and laboratory supplies are handled through a routine procedure for budget allocation in the biology department. Our current resources allow us to purchase a single cadaver during a semester, to be shared by all anatomy courses. However, if resources are not sufficient for this purchase, then we do not intend to offer this course during that semester. The cadaver itself is stored in a small ventilated room with restricted access. Only professors directly involved with the course have access to this room. This room is already present and is currently used for cadaver storage for Biology 150 Human Anatomy. Library holdings are adequate for the nature of the course. Travel funds are not necessary.**
- C3 Resources for this course are not funded by a grant.**
- C4 The course is intended to be offered either annually or every other year to meet student demand, and as department budget resources allow. This course is not designed for or restricted to certain seasonal semesters**
- C5 We will offer one lecture section with only one lab section (24 students).**
- C6 This course is restricted to a maximum of 24 students. Our current resources allow for a single cadaver to be used during a semester. The laboratory portion of the course involves students working in small groups to carefully dissect portions of the cadaver, both during and outside of scheduled laboratory periods. While this is manageable with 1 laboratory section of 24 students, it would become an impossible task with additional students or laboratory sections. A section of the cadaver cannot be re-dissected and every region of the body offers a unique configuration of organs and tissues. Additional students would significantly diminish the knowledge gained**

from this type of exploration and discovery. Therefore, additional students cannot be accommodated.

- C7** There is no professional society that makes recommendations about enrollment for this course. However, some medical schools, such as Saint Francis University, require a minimum of 4 credit hours for this type of anatomy course.
- C8** This is not proposed as a distance education course.

**Section D: Miscellaneous**

Include any additional information valuable to those reviewing this new course proposal.

Included is a letter of support from Dr. Larry Kupchella, Coordinator of the Natural Sciences Pre-Professional Programs.



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October 25, 2011

**TO WHOM IT MAY CONCERN:**

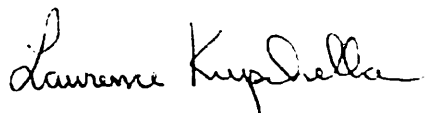
A significant fraction of our IUP students who are enrolled in the Natural Science BS program have selected the major because, after IUP, they have the goal of attending a professional school to pursue their Doctor of Physical Therapy (DPT) or Physician Assistant (PA) post-graduate education. For both the Natural Science/Pre-Physical Therapy track and the Natural Science (no declared track) majors, the courses were judiciously selected from the menu of courses already offered through the Biology, Chemistry, Physics, and Mathematics Departments. Specifically, the Natural Science/Pre-Physical Therapy track curriculum was created and designed to meet the undergraduate pre-requisite coursework that *most* professional schools that offer the DPT degree demand from their successful applicants. Although a corresponding track targeting post-graduate PA degree programs does not currently exist at IUP, our students have found that the curriculum for the Natural Science (no declared track) baccalaureate program sufficiently matches (or is at least flexible enough to allow them to meet) those pre-requisites. Over the past two years during which I served as the Natural Science Program Coordinator, I have interviewed a number of students and I have spoken to several others who are (or were at the time) in the midst of their professional school application process. Through those contacts, I learned that our program has at least one deficiency for students vying for DPT or PA professional school programs, namely our 3-credit BIOL 150 (Human Anatomy) requirement. It has been brought to my attention that some professional schools have out-of-hand rejected applications that were submitted by our students either because (1) the course number for Human Anatomy is too low, or because (2) they require that the pre-requisite number of credits for Human Anatomy be 4. These rejections have occurred even though the student had submitted an otherwise strong application package. Apparently, to some professional school admission committees, the "150" course number implies that, since the Human Anatomy course can be taken by students during their freshman year, it is not taught at a sufficiently advanced level to provide the students with the needed background in the subject. Other professional schools stated that, since the BIOL 150 course is only 3-credits, it is not sufficiently rigorous enough to cover all of the topics with the sort of depth that they feel is needed. Our students have challenged some of these decisions, arguing that the BIOL 150 course at IUP is both rigorous and advanced and have offered their syllabi as evidence. The Committees at some institutions have reconsidered and in some cases they have "bent" their own rules on this requirement regarding our graduates. Unfortunately, not all have, and this leaves our graduates at a disadvantage when applying to DPT and PA professional school programs. **With that information as background, it should be evident that I, as the current Coordinator of the Natural Science degree program, fully and enthusiastically support the creation of the new course, BIOL 402 (Advanced Human Anatomy). Indeed, once the course is established, I plan to submit a proposal to change the curriculum for both the Natural Science/Pre-Physical Therapy students and the Natural**

**Science (no declared track), that would allow the students to substitute the new BIOL 402 course for the old BIOL 150.** I do have a number of concerns, however, regarding the proposal as it is presented. These appear in bulleted format below:

- I trust that the course will remain coded as indicated, with BIOL 111 and BIOL 112 being the only prerequisites. If the course were coded as “senior standing”, BIOL 402 would not be accessible to students until their senior year. The substitution of BIOL 402 for BIOL 150 Natural Science curriculum would then create a scheduling problem for students who want to apply for early admission to professional school (i.e. students who want to participate in a 3+1 program).
- Under the “Course Analysis Questionnaire”, “Section A: Details of the Course”, “A7” I believe that “Physician Assistant” should be added.
- Under “Section C: Implementation”, the C4 and C5 statements clearly indicate that the course would not only be limited to an enrolment of 24, but that it might only be offered once a year. This would, I believe, present a problem in that I anticipate that the demand for the course, among Natural Science students alone, could easily exceed 40 students per year.

In summary, I fully support the new course proposal for BIOL 402 (Advanced Human Anatomy). The course would, in particular, benefit those BS Natural Science majors whose goal it is to transition into either DPT or PA post baccalaureate programs. It would benefit them by allowing them to meet the prerequisites and thus qualify for a wider range of such programs

Sincerely,



Lawrence Kupchella, Ph.D  
Coordinator, Natural Science Baccalaureate Program  
Department of Chemistry