DEC 5 2007

New Course Request **Indiana University** Bloomington Campus

Check Appropriate Boxes: ~~Undergraduate credit~~ ☒ Graduate credit ☒ Professional credit ☐ 82

1. School/Division Optometry 2. Academic Subject Code Vision Science
3. Course Number ~~V&E 1148~~ V707 (must be cleared with University Enrollment Services) 4. Instructor A. Elsner & S. Burns
5. Course Title Retinal Imaging

   Recommended Abbreviation (Optional) _____
   (Limited to 32 Characters including spaces)
6. First time this course is to be offered (Semester/Year): Spring 08
7. Credit Hours: Fixed at _____ or Variable from 2 to 3
8. Is this course to be graded S-F (only)? Yes _____ No ✓
9. Is variable title approval being requested? Yes _____ No ✓
10. Course description (not to exceed 50 words) for Bulletin publication: The fundamental methods used in imaging the human retina will be examined, including types of illumination & delivery methods, optical techniques for detection, interaction of light & tissues, systems integration & selection of imaging modalities based on scientific goals.
11. Lecture Contact Hours: Fixed at _____ or Variable from 2 to 3
12. Non-Lecture Contact Hours: Fixed at _____ or Variable from 0 to 3
13. Estimated enrollment: 10 of which 90% percent are expected to be graduate students.
14. Frequency of scheduling: annually Will this course be required for majors? No
15. Justification for new course: Most students on funded research grants work in this or related areas, but there was no formal course.
16. Are the necessary reading materials currently available in the appropriate library? yes
17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.
18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.
19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

_____ Date 11/14/07
Department Chairman/Division Director

Approved by:

_____ Date 11/5/07
Dean

_____ Date _____
Dean of Graduate School (when required)

_____ Date _____
Chancellor/Vice-President

_____ Date _____
University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

UPS 724

University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White

Optometry V~~497~~/707
Retinal Imaging
Spring Semester, 2008

The fundamental methods used in imaging the human retina will be examined in a broad sense, as a specific type of biomedical imaging and microscopy. The following optics will be covered.

Introduction to imaging and a systems approach

The necessary components needed to form an image and the data collection systems needed to acquire useful images will be described.

Different methods of introducing contrast in an image will be detailed.

Components and properties of imaging systems

The types of illumination sources and delivery methods will be compared.

Optical designs will be compared, and strengths and weakness discussed.

The detection of light using various optical techniques will be described.

Optical imaging systems

The optical systems approaches will be re-visited, in view of the more detailed background about key components.

The interaction of light with biological tissues

The optical properties of the tissues will be introduced.

The optical signatures of key retinal features will be described in terms of the method of producing contrast.

Safety concerns and computations will be presented.

Cross-cutting themes include systems integration, optimizing signal-to-noise, selection of imaging modalities based on the scientific goals, and image processing according to type of imaging system and scientific goal.

Laboratory exercises will include the demonstration of the performance of components, different types of imaging systems, different methods of data collection, and potential artifacts in systems.

Assessment for graduate students: For the main 2 credit component, grades will be assigned based on examinations, problem sets, and completion of the laboratory exercises.

The optional, additional 1 credit will be assessed by a written exercise, or a demonstration project accompanied by written documentation.

Assessment for undergraduate students: For the main 2 credit component, grades will be assigned based on examinations, problem sets, and completion of the laboratory exercises.

The optional, additional 1 credit will be assessed by a written exercise, or a demonstration project accompanied by written documentation. Undergraduate students will be required to arrange the project with the instructor during the first 4 weeks of the semester and complete a written progress report about the project that is due 1 week prior to mid-term grades.