

**New Course Request**

**Indiana University**

Indianapolis Campus

Check Appropriate Boxes: Undergraduate credit  Graduate credit  Professional credit

1. School/Division Science / Forensic Science 2. Academic Subject Code FIS

3. Course Number 506 (must be cleared with University Enrollment Services) 4. Instructor Siegel

5. Course Title Forensic Microscopy

Recommended Abbreviation (Optional) \_\_\_\_\_  
(Limited to 32 Characters including spaces)

6. First time this course is to be offered (Semester/Year): spring / 2010

7. Credit Hours: Fixed at 3 or Variable from \_\_\_\_\_ to \_\_\_\_\_

8. Is this course to be graded S-F (only)? Yes \_\_\_\_\_ No X

9. Is variable title approval being requested? Yes \_\_\_\_\_ No X

10. Course description (not to exceed 50 words) for Bulletin publication: Spring. Techniques in the analysis of forensic microscopic evidence. Topics include property of light, compound microscopy, micrometry, refraction, dispersion, stereomicroscopy, sample preparation, polarizing light microscopy, and instrumental microscopy.

11. Lecture Contact Hours: Fixed at 1 or Variable from \_\_\_\_\_ to \_\_\_\_\_

12. Non-Lecture Contact Hours: Fixed at 2 or Variable from \_\_\_\_\_ to \_\_\_\_\_

13. Estimated enrollment: 10 of which 100 percent are expected to be graduate students.

14. Frequency of scheduling: every spring Will this course be required for majors? yes

15. Justification for new course: This course will be required of majors.

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: [Signature] Date 12/2/08  
 Department Chairman/Division Director

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
 Dean GRADUATE SCHOOL

[Signature] Date 12/11/2008  
 Dean of Graduate School (when required)

Chancellor/Vice-President \_\_\_\_\_ Date \_\_\_\_\_  
 University Enrollment Services \_\_\_\_\_ Date \_\_\_\_\_

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.

**PURDUE UNIVERSITY**  
REQUEST FOR ADDITION, EXPIRATION,  
OR REVISION OF A GRADUATE COURSE  
(50000-60000 LEVEL)

**Print Form**

DEPARTMENT Chemistry and Chemical Biology

EFFECTIVE SESSION Spring 2010

**INSTRUCTIONS:** Please check the items below which describe the purpose of this request.

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> 1. New course with supporting documents (complete proposal form) | <input type="checkbox"/> 7. Change in course attributes              |
| <input type="checkbox"/> 2. Add existing course offered at another campus                            | <input type="checkbox"/> 8. Change in instructional hours            |
| <input type="checkbox"/> 3. Expiration of a course   | <input type="checkbox"/> 9. Change in course description             |
| <input type="checkbox"/> 4. Change in course number  | <input type="checkbox"/> 10. Change in course requisites             |
| <input type="checkbox"/> 5. Change in course title   | <input type="checkbox"/> 11. Change in semesters offered             |
| <input type="checkbox"/> 6. Change in course credit/type   | <input type="checkbox"/> 12. Transfer from one department to another |

**PROPOSED:**

**EXISTING:**

**TERMS OFFERED**

Check All That Apply:

Subject Abbreviation FIS

Subject Abbreviation \_\_\_\_\_

Summer  Fall  Spring

Course Number 506

Course Number \_\_\_\_\_

**CAMPUS(ES) INVOLVED**

Long Title Forensic Microscopy

Long Title \_\_\_\_\_

Calumet  N. Central  
 Cont Ed  Tech Statewide  
 Ft. Wayne  W. Lafayette  
 Indianapolis

Short Title \_\_\_\_\_

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

**CREDIT TYPE**

1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range:  
 Minimum Cr. Hrs. \_\_\_\_\_  
 (Check One) To  Or   
 Maximum Cr. Hrs. \_\_\_\_\_
3. Equivalent Credit: Yes  No
4. Thesis Credit: Yes  No

**COURSE ATTRIBUTES: Check All That Apply**

1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable   
 Maximum Repeatable Credit: \_\_\_\_\_
4. Credit by Examination
5. Special Fees
6. Registration Approval Type  
 Department  Instructor
7. Variable Title
8. Honors
9. Full Time Privilege
10. Off Campus Experience

Schedule Type	Minutes Per Mtu	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	57	1	16	34
Recitation				
Presentation				
Laboratory	113	1	16	66
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

**Cross-Listed Courses**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):**

Spring. Techniques in the analysis of forensic microscopic evidence. Topics include property of light, compound microscopy, micrometry, refraction, dispersion, stereomicroscopy, sample preparation, polarizing light microscopy, and instrumental microscopy.

Calumet Department Head _____ Date	Calumet School Dean _____ Date	Calumet Undergrad Curriculum Committee _____ Date
Fort Wayne Department Head _____ Date	Fort Wayne School Dean _____ Date	Fort Wayne Chancellor _____ Date
Indianapolis Department Head _____ Date	Indianapolis School Dean <u>James M. Murphy 12/11/2008</u>	Undergrad Curriculum Committee _____ Date
North Central Department Head _____ Date	North Central Chancellor _____ Date	Date Approved by Graduate Council _____
West Lafayette Department Head _____ Date	West Lafayette College/School Dean _____ Date	Graduate Council Secretary _____ Date
Graduate Area Committee Convener _____ Date	Graduate Dean _____ Date	West Lafayette Registrar _____ Date

## Supporting Document for a New Graduate Course

**To:** Purdue University Graduate Council

**From:** Faculty Member: Jay A. Siegel  
Department: Chemistry and Chemical Biology  
Campus: Indianapolis

**Date:** December 1, 2008

**Subject:** Proposal for New Graduate Course-Documentation  
Required by the Graduate Council to Accompany  
Registrar's Form 40G

For Reviewer's comments only  
(Select One)

Reviewer:

Comments:

**Contact for information if questions arise:** Name: Jay A. Siegel  
Phone Number: (317) 274-6883  
E-mail: jasiegel@iupui.edu  
Campus Address: Chemistry and Chemical Biology, LD 326, Indpls

Course Subject Abbreviation and Number: FIS 506

Course Title: Forensic Microscopy

### A. Justification for the Course:

- Provide a complete and detailed explanation of the need for the course (e. g., in the preparation of students, in providing new knowledge/training in one or more topics, in meeting degree requirements, etc.), how the course contributes to existing fields of study and/or areas of specialization, and how the course relates to other graduate courses offered by the department, other departments, or interdisciplinary programs.
- Justify the level of the proposed graduate course (50000- or 60000-level) including statements on, but not limited to: (1) the target audience, including the anticipated number of undergraduate and graduate students who will enroll in the course; and (2) the rigor of the course.

### B. Learning Outcomes and Method of Evaluation or Assessment:

- Describe the course objectives and student learning outcomes that address the objectives (i.e., knowledge, communication, critical thinking, ethical research, etc.).
- Describe the methods of evaluation or assessment of student learning outcomes. (Include evidence for both direct and indirect methods.)
- Grading criteria (select from dropdown box); include a statement describing the criteria that will be used to assess students and how the final grade will be determined.

**Criteria**

- Identify the method(s) of instruction (select from dropdown box) and describe how the methods promote the likely success of the desired student learning outcomes.

**Method of Instruction**

**C. Prerequisite(s):**

- List prerequisite courses by subject abbreviation, number, and title.
- List other prerequisites and/or experiences/background required. If no prerequisites are indicated, provide an explanation for their absence.

**D. Course Instructor(s):**

- Provide the name, rank, and department/program affiliation of the instructor(s).
- Is the instructor currently a member of the Graduate Faculty?  Yes  No  
(If the answer is no, indicate when it is expected that a request will be submitted.)

**E. Course Outline:**

- Provide an outline of topics to be covered and indicate the relative amount of time or emphasis devoted to each topic. If laboratory or field experiences are used to supplement a lecture course, explain the value of the experience(s) to enhance the quality of the course and student learning. For special topics courses, include a sample outline of a course that would be offered under the proposed course.

**F. Reading List (including course text):**

- A primary reading list or bibliography should be limited to material the students will be required to read in order to successfully complete the course. It should not be a compilation of general reference material.
- A secondary reading list or bibliography should include material students may use as background information.

**G. Library Resources**

- Describe the library resources that are currently available or the resources needed to support this proposed course.

**H. Example of a Course Syllabus** (While not a necessary component of this supporting document, an example of a course syllabus is available, for information, by clicking on the link below, which goes to the *Graduate School's Policies and Procedures Manual for Administering Graduate Student Programs*. See Appendix K.)

[http://www.gradschool.purdue.edu/downloads/Graduate\\_School\\_Policies\\_and\\_Procedures\\_Manual.pdf](http://www.gradschool.purdue.edu/downloads/Graduate_School_Policies_and_Procedures_Manual.pdf)

## **FIS 506 *Forensic Microscopy***

### **A. Justification for the Course:**

Microscopy is one of the foundational tools in forensic science. There are more microscopes in forensic science laboratories than any other instruments. It is critical that all of our students have basic and advanced knowledge about forensic microscopy. This course will be required of all students in the program. A 500 level number has been chosen because we expect that there may be a few undergraduates who take the class for honors credit or as part of a 5 year program.

### **B. Learning Outcomes and Method of Evaluation or Assessment:**

#### **Objectives of the course.**

At the conclusion of this course, the student should be able to do the following:

1. Apply stereomicroscopy to the analysis of trace evidence
2. Apply compound microscopy to the analysis of trace evidence
3. Apply polarized light microscopy to the analysis of trace evidence
4. Apply infrared microscopy to the analysis of trace evidence
5. Apply UV-visible microspectrophotometry to the analysis of trace evidence
6. Analyze basic types of trace evidence

#### **Methods of evaluation or assessment of student learning outcomes.**

This course will cover the major techniques used in the analysis trace evidence commonly encountered at crime scenes. The techniques of stereo and compound light microscopy and polarizing light microscopy will be studied and used extensively. Instrumental microscopy techniques such as infrared microscopy, UV-Vis microspectrophotometry, and Raman microscopy will be discussed. There will lecture and lab components for each of topics covered in the course.

Pre-lab exercises are due before the start of each lab exercise. Each exercise is worth 5 points and is to be turned at the beginning of the lab period. Late pre-labs will not be accepted. Laboratory reports and notebook pages are worth a total of 45 points and are due one week after completing the lab exercise. These are to be turned in to your course supervisor along with copies of your lab notebook pages for that exercise. The late penalty is 3 points per day late. This includes the total grade on report and notebook pages. Unknown results should also be turned in with your report. Late unknown results will result in 1 point per day late. Weekends do not count towards late penalty. Reports will have a cover sheet to be turned in with report. These include point break down of report and unknown result. These can be found on OnCourse CL.

Research reports will be due at the beginning of each class period. Each will be worth 15 points and be graded on clarity, content, and understanding. Each student will be responsible for finding a research project within the last five years using one of the following types of microscopy polarizing light microscopy, compound microscopy, stereomicroscopy, FTIR microscopy, Raman microscopy, or microspectrophotometry and how it can be related to forensic trace evidence analysis. Each student may use any peer-reviewed journal available. Each student will be required to write a two-

page report summarizing the research, explain how it can be applied to forensic analyst, and a copy of the article. Each student may also be asked to briefly talk about their report to the class.

### **Graduate project.**

A graduate project will be done throughout the semester. The project will include but is not limited to, a research paper in microscopy with a presentation on the topic. Each student will be responsible for readings on your topic and updated. This will be discussed more in detail throughout the semester.

### **Grading.**

	<b>Points</b>
9 Pre-lab exercises at 5 points	45
9 Lab Reports at 40 points	360
9 Lab Notebook pages at 5 points	45
5 Unknown Results at 10 points	50
9 Research Reports at 15 points	135
Graduate Project	150
Final Lab Exercise	150
<b>Total</b>	<b>800</b>

### **Grading scale.**

Final grades will be based on a strict grading scale as outlined below. There will be no curving of final grades.

A: 100 – 93%	A-: 92.9 – 90%	B+: 89.9 – 87%
B: 86.9 – 83%	B-: 82.9 – 80%	C+: 79.9 – 77%
C: 76.9 – 73%	C-: 72.9 – 70%	D+: 69.9 – 67%
D: 66.9 – 63%	D-: 62.9 – 60%	F: less than 60%

### **C. Prerequisite(s):**

Prerequisite: FIS 505 *Seminar in Forensic Science* and FIS 511 *Forensic Chemistry I*. Open only to students in the Master of Science in Forensic Science Program.

### **D. Course Instructor(s):**

Jay A. Siegel, tenured, Forensic and Investigative Sciences Program.

Instructor is a member of graduate faculty.

## E. Course Outline:

### Schedule of Activities

Start Date	Topic	Textbook
January 13	Lecture 1: Orientation and overview of course, general microscopy	
	Laboratory exercise 1	
January 20	Lecture 2: Property of Light, lens, focus distance	
	Laboratory exercise 2	
January 27	Lecture 3: Kohler Illumination, stage alignment, calibration	
	Laboratory exercise 3	
February 10	Lecture 4: Sample Preparation	
	Laboratory exercise 4	
February 17	No Class – AAFS Meeting in Colorado	
February 24	Lecture 5: Micrometry and Morphology	
	Laboratory exercise 5	
March 10	Lecture 6: Refraction, Becke line, Dispersion	
	Laboratory exercise 6	
March 17	No Class – Spring Break	
March 31	Lecture 7: Polarizing Light Microscopy	
	Laboratory exercise 7	
April 14	Lecture 8: Cross Polars	
	Laboratory exercise 8	
April 28	Lecture 9: Instrumental Microscopy	
	Laboratory exercise 9	
May	Final: Laboratory exercise 10	

## F. Reading List (including course text):

### Textbook.

*Essentials of Polarizing Light Microscopy*  
by John Gustav Delly.

### **G. Library Resources.**

All of the needed journals and books are available either at IUPUI or through IU (IUCAT) or Purdue (interlibrary loan).

### **H. Example of a Course Syllabus.**

Attached.

# Forensic Microscopy

## FIS 506

Course Syllabus

Spring 2010

**Dr. Jay A. Siegel**

**Faculty - Forensic and Investigative Sciences Program**

jasiegel@iupui.edu

Office: LD 326

Phone: 274-6883

Office Hours: by appointment

**Class times and location:** Tuesday 9:00-11:50am, Room SL 309.

**Textbook (REQUIRED):** Essentials of Polarizing Light Microscopy, by John Gustav Delly.  
You will also need safety glasses.

**Attendance:** Mandatory.

### Course Description

Learn techniques in the analysis of forensic microscopic evidence. Topics include property of light, compound microscopy, micrometry, refraction, dispersion, stereomicroscopy, sample preparation, polarizing light microscopy, and instrumental microscopy.

### Course Content and Organization

This course will cover the major techniques used in the analysis trace evidence commonly encountered at crime scenes. The techniques of stereo and compound light microscopy and polarizing light microscopy will be studied and used extensively. Instrumental microscopy techniques such as infrared microscopy, UV-Vis microspectrophotometry, and Raman microscopy will be discussed. There will lecture and lab components for each of topics covered in the course.

**Course objectives: At the end of this course, students should be able to...**

1. Apply stereomicroscopy to the analysis of trace evidence
2. Apply compound microscopy to the analysis of trace evidence
3. Apply polarized light microscopy to the analysis of trace evidence
4. Apply infrared microscopy to the analysis of trace evidence
5. Apply UV-visible microspectrophotometry to the analysis of trace evidence
6. Analyze basic types of trace evidence

*Academic Misconduct*

*(Taken from Academic Handbook, 2001 and the Code of Student Rights, Responsibilities, and Conduct)*

*[http://www.indiana.edu/~deanfac/acadhbkc/acad\\_handbk\\_2001.pdf](http://www.indiana.edu/~deanfac/acadhbkc/acad_handbk_2001.pdf)*

*<http://www.life.iupui.edu/Who/Dean/Code>*

*The Academic Handbook states that faculty members have the responsibility of fostering the "intellectual honesty as well as the intellectual development of students....The faculty member should explain clearly the meaning of cheating and plagiarism as they apply to the course....Should the faculty member detect signs of plagiarism or cheating, it is his or her most serious obligation to investigate these thoroughly, to take appropriate action with respect to the grades of students, and in any event to report the matter to the Dean of Students. The necessity to report every case of cheating, whether or not further action is desirable, arises particularly because of the possibility that this is not the student's first offense, or that other offenses may follow it. Equity also demands that a uniform reporting practice be enforced; otherwise, some students will be penalized while others guilty of the same actions will go free." (p. 172).*

*Academic Misconduct: (from the Code of Student Rights, Responsibilities, and Conduct)*

*1. Cheating: A student must not use or attempt to use unauthorized assistance, materials, information, or study aids in any academic exercise, including, but not limited to, the following:*

*a. A student must not use external assistance on any "in-class" or "take-home" examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, and calculators.*

*b. A student must not use another person as a substitute in the taking of an examination or quiz.*

*c. A student must not steal examinations or other course materials.*

*d. A student must not allow others to conduct research or to prepare work for him or her without advance authorization from the instructor to whom the work is being submitted. Under this prohibition, a student must not make any unauthorized use of materials obtained from commercial term paper companies or from files of papers prepared by other persons.*

*e. A student must not collaborate with other persons on a particular project and submit a copy of a written report which is represented explicitly or implicitly as the student's individual work.*

*f. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on field work.*

*g. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor to whom the work is being submitted.*

*h. A student must not alter a grade or score in any way.*

*2. Fabrication: A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citations to the sources of information.*

*3. Plagiarism: A student must not adopt or reproduce ideas, words, or statements of another person without appropriate acknowledgment. A student must give credit to the originality of others and acknowledge indebtedness whenever he or she does any of the following:*

*a. Quotes another person's actual words, either oral or written;*

*b. Paraphrases another person's words, either oral or written;*

*c. Uses another person's idea, opinion, or theory; or*

*d. Borrows facts, statistics, or other illustrative material, unless the information is common knowledge.*  
**4. Interference**

*a. A student must not steal, change, destroy, or impede another student's work. Impeding another student's work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.*

*b. A student must not give or offer a bribe, promise favors, or make threats with the intention of affecting a grade or the evaluation of academic performance.*

**Faculty Action**

*If a faculty member has information that one of his/her students committed an act of academic misconduct, the faculty member is required to hold an informal conference with the student. The conference should be prompt and private. If the faculty member concludes that the student is responsible for the misconduct, then the faculty member is authorized to impose an appropriate academic sanction (i.e., lower or failing grade on the assignment, assessing a lower or failing grade for the course).*

*After reporting the information to the Dean of Students, he/she will review the information to determine if additional sanctions should be applied.*

*Sanctions are outlined in the Code of Student Rights, Responsibilities, and Conduct. This document appears on the web at the following address: <http://www.life.iupui.edu/Who/Dean/Code/>*

**Policy on Student Academic Misconduct**

*Faculty are required to report all incidents of academic misconduct to the Dean of Students. For information about policies and procedures, including due process requirements, see the Code of Student Rights, Responsibilities, and Conduct, especially part III: Student Misconduct and Part IV: Student Disciplinary Procedures. The code is accessible on the internet at [http://www.life.iupui.edu/Who/Dean/Code](http://www.life.iupui.edu/Who/Dean/Code/)*

*If you need any special accommodations due to a disability, please contact Adaptive Educational Services at (317)-274-3241. The office is located in CA 001E*

## Grading

	<b>Points</b>
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Graduate Project	150
Final Lab Exercise	150
<b>Total</b>	<b>800</b>

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### Graduate Project

A graduate project will be done throughout the semester. The project will include but is not limited to, a research paper in microscopy with a presentation on the topic. You will be responsible for readings on your topic and updated This will be discussed more in detail throughout the semester.

### Grading Scale

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A: 100 – 93%	A-: 92.9 – 90%	B+: 89.9 – 87%
B: 86.9 – 83%	B-: 82.9 – 80%	C+: 79.9 – 77%
C: 76.9 – 73%	C-: 72.9 – 70%	D+: 69.9 – 67%
D: 66.9 – 63%	D-: 62.9 – 60%	F: less than 60%

### OnCourse

You will need to have access to the internet for this course. OnCourse will be used on a regular basis for upload lab materials such as pre-labs, laboratory exercises, and post-labs, as well as report sheets and cover sheets for the labs. We will also post lecture handouts and power point presentations on OnCourse. If you have questions on using OnCourse please ask. We will also be using the newest version of Windows (2007). Microsoft has a patch available to download for free so that you are able to open documents in 2003 written in 2007. However, UITS has Windows 2007 available to students at no cost to download, which I would recommend.

### Schedule of Activities

Start Date	Topic	Textbook
January 13	Lecture 1: Orientation and overview of course, general microscopy	
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	Laboratory exercise 9	
May	Final: Laboratory exercise 10	