

Rochester INSTITUTE OF TECHNOLOGY

Minor Program proposal form

COLLEGE OF SCIENCE

**Chester F. Carlson Center for Imaging Science**

**Name of Certifying Academic Unit:** Center for Imaging Science

**Name of Minor:** Imaging Science

**Brief description of the minor to be used in university publications**

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| Imaging Science is a highly interdisciplinary field of study that incorporates elements from mathematics, engineering, computer science, and physics to understand, design, and utilize imagery and imaging systems to study scientific phenomena. The minor in Imaging Science is designed to allow students from various departments across the campus to study how to use imaging to enhance their primary filed of study or discover how to incorporate their major discipline to solving complex, interdisciplinary problems in imaging, imagery exploitation, and the design and evaluation of imaging systems. |

**1.0 Minor Program Approvals**

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|  | Approval request date: | Approval granted date: |
| Academic Unit Curriculum Committee | 1/23/2012 | 1/27/2012 |
| College Curriculum Committee | 2/14/2012 | 2/14/2012 |
| Inter-College Curriculum Committee | 4/16/2012 | 4/16/2012 |

**2.0 Rationale:**

A minor at RIT is a related set of academic courses consisting of no fewer than 15 semester credit hours leading to a formal designation on a student's baccalaureate transcript

How is this set of academic courses related?

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| The set of academic courses cover the individual aspects of the imaging chain; that set of physical, mathematical, computational, and engineering topics that allow for the formation of imagery, its exploitation and understanding. |

**3.0 Multidisciplinary involvement:**

If this is a multidisciplinary minor spanning two or more academic units, list the units and their role in offering and managing this minor.

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| No |

**4.0 Students ineligible to pursue this minor:**

The purpose of the minor is both to broaden a student's college education and deepen it in an area outside the student’s major program. A minor may be related to and complement a student’s major, or it may be in a completely different academic/professional area.   It is the responsibility of the academic unit proposing a minor and the unit’s curriculum committee to indicate any home programs for which the minor is not a broadening experience.

Please list below any home programs whose students will not be allowed to pursue this minor, provide the reasoning, and indicate if this exclusion has been discussed with the affected programs:

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| Imaging Science (home department) |

**5.0 Minor Program Structure, Sequence and Course Offering Schedule:**

Describe the structure of the proposed minor and list all courses, their anticipated offering schedule, and any prerequisites.

* All minors must contain at least fifteen semester credit hours;
* Minors may be discipline-based or interdisciplinary;
* In most cases, minors shall consist of a minimum of two upper division courses (300 or above) to provide reasonable breadth and depth within the minor;
* As per New York State requirements, courses within the minor must be offered with sufficient frequency to allow students to complete the minor within the same time frame allowed for the completion of the baccalaureate degree;
* Provide a program mask showing how students will complete the minor.

Narrative of Minor Program Structure:

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| As Imaging Science is a highly interdisciplinary course of study, this minor is intended to concentrate and specialize in a related set of courses addressing a particular, specific topical area in the discipline. The specific topical areas suggested for minors are a) image processing, b) color and vision, c) detectors, and d) optics. Students are required to take at least one course 300-level or above. At least three courses (9 credits) should be Imaging Science (IMGS) courses. Students are also able to design a course sequence with the approval of the Imaging Science undergraduate program director. |

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| Course Number & Title | SCH | Required | Optional | Fall | Spring | Annual/Bi annual | Prerequisites |
|  |  |  |  |  |  |  |  |
| COS-MATH-233 Linear Systems & Differential Equations | 3 |  | a, d |  | x | Annual | COS-MATH-182 (or COS-MATH-173) |
| COS-MATH-241 Linear Algebra | 3 |  | a, b, d | x | x | Annual | COS-MATH-219 or COS-MATH-221 or COS-MATH-190 or COS-MATH-192 |
| COS-MATH-251 Probability & Statistics I | 3 |  | a, b | x | x | Annual | COS-MATH-182 (or COS-MATH-173) C: COS-MATH-221 |
| COS-PHYS-213 Modern Physics I | 3 |  | c |  |  | Annual | COS-PHYS-212 |
| COS-PHYS-283 Vibrations & Waves | 3 |  | c, d |  | x | Annual | COS-PHYS-212, COS-MATH-182 (or COS-MATH-173) |
| COS-PHYS-320 Mathematical Methods in Physics | 3 |  | a, d | x |  | Annual | COS-MATH-219 or COS-MATH-221, COS-MATH-231, COS-PHYS-212 |
| COS-IMGS-201 Introduction to Imaging Systems | 3 |  | a, b, c, d | x |  | Annual | COS-MATH-182, COS-PHYS-211 |
| COS-IMGS-261 Linear and Fourier Methods for Imaging | 4 | a | d |  | x | Annual | COS-MATH-221 |
| COS-IMGS-361 Digital Image Processing I | 3 | a |  | x |  |  | COS-IMGS-211,COS-IMGS-261 |
| COS-IMGS-362 Digital Image Processing II | 3 | a |  |  | x | Annual | COS-IMGS-361 |
| COS-IMGS-462 Multivariate Statistical Image Processing | 3 |  | a | x |  | Annual | COS-IMGS-362 |
| COS-IMGS-221 Vision and Psychophysics | 3 | b |  | x |  | Annual | none |
| COS-IMGS-251 Radiometry | 3 | b, c, d |  |  | x | Annual | COS-MATH-182 (or COS-MATH-173), COS-PHYS-212 |
| COS-IMGS-351 Color Science | 3 | b |  | x |  | Annual | COS-IMGS-221,COS-IMGS-251 |
| COS-IMGS-341 Interactions Between Light & Matter | 3 | c | b |  | x | Annual | COS-PHYS-213 |
| COS-IMGS-451 Imaging Detectors | 3 | c |  |  | x | Annual | COS-IMGS-251,COS-IMGS-341 |
| COS-IMGS-528 Design and Fabrication of a Solid State Camera | 3 |  | c | x |  | Annual | Permission of instructor |
| COS-IMGS-539 Principles of Solid State Imaging Array | 3 |  | c | x |  | Annual | Permission of instructor |
| COS-IMGS-542 Testing of Focal Plane Arrays | 3 |  | c |  | x | Annual | Permission of instructor |
| COS-IMGS-321 Geometric Optics | 3 | d |  | x |  | Annual | COS-PHYS-211 |
| COS-IMGS-322 Physical Optics  or  COS-PHYS-365 Physical Optics | 3 | d |  |  | x | Annual | COS-PHYS-212,COS-MATH-221 or COS-MATH-219,COS-IMGS-365 or COS-PHYS-225,COS-IMGS-261 or both COS-PHYS-283 and COS-PHYS-320 |

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| Total credit hours: | 15 minimum |

Policy Name: **D1.1 MINORS POLICY**

 1. Definition

A minor at RIT is a related set of academic courses consisting of no fewer than 15 semester credit hours leading to a formal designation on a student's baccalaureate transcript.

The purpose of the minor is both to broaden a student's college education and deepen it in an area outside the student’s major program. A minor may be related to and complement a student’s major, or it may be in a completely different academic/professional area.   It is the responsibility of the academic unit proposing a minor and the unit’s curriculum committee to indicate any home programs for which the minor is not a broadening experience.

In most cases, minors shall consist of a minimum of two upper division courses to provide reasonable breadth and depth within the minor.

2. Institutional parameters

1. Minors may be discipline-based or interdisciplinary;
2. Only matriculated students may enroll in a minor;
3. At least nine semester credit hours of the minor must consist of courses not required by the student's home program;
4. Students may pursue multiple minors.  A minimum of nine semester credit hours must be designated towards each minor; these courses may not be counted towards other minors;
5. The residency requirement for a minor is a minimum of nine semester credit hours consisting of RIT courses (excluding "X" graded courses);
6. Posting of the minor on the student's academic transcript requires a minimum GPA of 2.0 in each of the minor courses;
7. Minors may not be added to the student's academic record after the granting of the bachelor's degree.

3. Development/approval/administration processes

* 1. Minors may be developed by faculty at the departmental, inter-departmental, college, or inter-college level. As part of the minor development process:
     1. students ineligible for the proposed minor will be identified;
     2. prerequisites, if any, will be identified;
  2. Minor proposals must be approved by the appropriate academic unit(s) curriculum committee, and college curriculum committee(s), before being sent to the Inter-College Curriculum Committee (ICC) for final consideration and approval.
  3. The academic unit offering the minor (in the case of interdisciplinary minors, the designated college/department) is responsible for the following:
     1. enrolling students in the minor (as space permits);
     2. monitoring students progress toward completion of the minor;
     3. authorizing the recording of the minor's completion on student's academic records;
     4. granting of transfer credit, credit by exam, credit by experience, course substitutions, and advanced placement;
     5. responding to student requests for removal from the minor.
  4. As per New York State requirements, courses within the minor must be offered with sufficient frequency to allow students to complete the minor within the same time frame allowed for the completion of the baccalaureate degree.

4. Procedures for Minor revision

It is the duty of the college curriculum committee(s) involved with a minor to maintain the program’s structure and coherence.  Once a minor is approved by the ICC, changes to the minor that do not have a significant effect on its focus may be completed with the approval of the involved academic unit(s) and the college curriculum committee(s).  Significant changes in the focus of the minor must be approved by the appropriate academic unit(s) curriculum committee(s), the college curriculum committee(s) and be resubmitted to the ICC for final consideration and approval.