

Rochester INSTITUTE OF TECHNOLOGY

Minor Program proposal form

COLLEGE OF SCIeNCE

**Name of Certifying Academic Unit:** Department of Physics

**Name of Minor:** Astronomy

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

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| This minor provides students with the opportunity for additional study in Astronomy in order to build a secondary area of expertise in support of their program or other areas of interest. The minor will provide students with a broad background in the subject at a level sufficient to serve as a foundation for graduate level studies in Astronomy or Astrophysics. |

**1.0 Minor Program Approvals**

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|  | Approval request date: | Approval granted date: |
| Academic Unit Curriculum Committee | 2/15/12 | 2/16/12 |
| College Curriculum Committee | 2/20/12 | 2/21/12 |
| Inter-College Curriculum Committee | 3/12/12 | 4/16/12 |

**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 courses provide a broad survey of modern astrophysics and the techniques and technologies used to investigate astronomical phenomena. |

**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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| The courses are offered by the Department of Physics, the Center for Imaging Sciences, and the School of Mathematical Sciences. The Department of Physics will have the administrative control of the minor. |

**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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| None |

**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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| **Eligibility** Any student satisfying the prerequisites may pursue this minor, provided that at least 9 credit hours are in courses not required by the home program.  **Prerequisites**  A student must be matriculated in a baccalaureate program and must have successfully completed the following courses or the equivalent:   * COS-MATH-181 Project Based Calculus I * COS-MATH-182 Project Based Calculus II * COS-PHYS-211 University Physics I * COS-PHYS-212 University Physics II * COS-PHYS-213 Modern Physics I   **Requirements**   * COS-PHYS-220 University Astronomy * One Astrophysics course chosen from:   + COS-PHYS-370 Stellar Astrophysics   + COS-PHYS-371 Galactic Astrophysics   + COS-PHYS-372 Extragalactic Astrophysics and Cosmology * One Experimental course chosen from:   + COS-PHYS-373 Observational Astronomy   + COS-IMGS-461 Multi-wavelength Astronomical Imaging   + COS-IMGS-528 Design and Fabrication of a Solid State Camera * Two additional courses from the listing below, or other courses deemed satisfactory by the minor program director. * A grade of a C or better must be attained in all courses applied to the minor. * All prerequisites must be met prior to taking courses that require them. * 9 credits must be in courses not required by the student's home program and must be completed in residency at RIT. * At least two courses must be 300-level or above. |

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| Course Number & Title | SCH | Required | Optional | Fall | Spring | Annual/  Biennial | Prerequisites |
| PHYS-220 University Astronomy | 3 | X |  | X | X | Annual | PHYS-211 |
| PHYS-370 Stellar Astrophysics | 3 |  | X |  | X | Biennial | PHYS-213, PHYS-220 |
| PHYS-371 Galactic Astrophysics | 3 |  | X | X |  | Biennial | PHYS-213, PHYS-220 |
| PHYS-372 Extragalactic Astrophysics and Cosmology | 3 |  | X | X |  | Biennial | PHYS-213, PHYS-220 |
| PHYS-373 Observational Astronomy | 3 |  | X |  | X | Biennial | PHYS-213, PHYS-220 |
| IMGS-461 Multi-wavelength Astronomical Imaging | 3 |  | X | X |  | Annual | PHYS-213 |
| IMGS-528 Design & Fabrication of a Solid State Camera | 3 |  | X | X |  | Annual | Fourth-year standing in Imaging Science or permission of instructor |
| IMGS-361 Digital Image Processing I | 3 |  | X | X |  | Annual | MATH-251, IMGS-261 |
| IMGS-362 Digital Image Processing II | 3 |  | X |  | X | Annual | IMGS-361 |
| IMGS-451 Imaging Detectors | 3 |  | X |  | X | Annual | IMGS-251, IMGS-341 or equivalent |
| PHYS-493 Astrophysics Research | Max 4 |  | X | X | X | Annual | Permission of instructor |

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| Total credit hours: 15 |  |

**Minor Course Conversion Table: Quarter Calendar and Semester Calendar Comparison**

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| **Directions: The tables on this page will be used by the registrar’s office to aid student’s transitioning from the quarter calendar to the semester calendar.**  **If this minor existed in the quarter calendar and is being converted to the semester calendar please complete the following tables.**  **If this is a new minor that did not exist under the quarter calendar do not complete the following tables.**  Use the following tables to show minor course comparison in quarter and semester calendar formats. Use courses in the (2011-12) minor mask for this table. Display all required and elective minor courses. If necessary clarify how course sequences in the quarter calendar convert to semesters by either bracketing or using some other notation. |

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| Name of Minor in Semester Calendar: | Astronomy |
| Name of Minor in Quarter Calendar: | Astronomy |
| Name of Certifying Academic Unit: | Department of Physics |

| **QUARTER: Current Minor Courses** | | | **SEMESTER: Converted Minor Courses** | | |  |
| --- | --- | --- | --- | --- | --- | --- |
| Course # | Course Title | QCH | Course # | Course Title | SCH | **Comments** |
| 1016-281  1016-282  1016-283 | Project-based Calculus I  Project-based Calculus II  Project-based Calculus III | 4  4  4 | MATH-181  MATH-182 | Project-based Calculus I  Project-based Calculus II | 4  4 | 1016-281 and part of 1016-282  1016-283 and part of 1016-282 |
| 1017-311  1017-312  1017-313 | University Physics I  University Physics II  University Physics III | 5  5  4 | PHYS-211  PHYS-212 | University Physics I  University Physics II | 4  4 | 1017-311 and part of 1017-312  1017-313 and part of 1017-312 |
| 1017-314 | Modern Physics I | 4 | PHYS-213 | Modern Physics I | 3 |  |
| 1017-440 | Stellar Astrophysics | 4 | PHYS-370 | Stellar Astrophysics | 3 |  |
| 1017-442 | Galactic Astrophysics | 4 | PHYS-371 | Galactic Astrophysics | 3 |  |
| 1017-443 | Extragalactic Astrophysics | 4 | PHYS-372 | Extragalactic Astrophysics and Cosmology | 3 |  |
| 1017-455 | Observational Astronomy | 4 | PHYS-373 | Observational Astronomy | 3 |  |
| 1051-446 | Multi-wavelength Astronomical Imaging | 4 | IMGS-461 | Multi-wavelength Astronomical Imaging | 3 |  |
| 1051-528 | Design and Fabrication of a Solid State Camera | 4 | IMGS-528 | Design and Fabrication of a Solid State Camera | 3 |  |
| 1051-361 | Digital Image Processing I | 4 | IMGS-361 | Digital Image Processing I | 3 |  |
| 1051-462 | Digital Image Processing II | 4 | IMGS-362 | Digital Image Processing II | 3 |  |
| 1051-465 | Detectors | 4 | IMGS-451 | Imaging Detectors | 3 |  |
| 1017-539 | Astrophysics Research | 1-4 | PHYS-493 | Astrophysics Research | 1-4 |  |