

Rochester INSTITUTE OF TECHNOLOGY

Minor Program proposal form

COLLEGE OF SCIeNCE

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

**Name of Minor:** Physics

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

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| In a broad sense, the aim of Physics as a discipline is to develop interconnected unifying threads bridging the vast number of seemingly diverse phenomena observed in the physical world around us. This minor provides students with the opportunity for additional study in Physics in order to build a secondary area of expertise in support of their program or other areas of interest.  |

**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 | 2/19/12 | 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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| All courses for this minor are offered by the Department of Physics. |

**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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| N/A |

**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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| Majors within the Department of Physics are ineligible for this minor. |

**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 not enrolled in a major of the Department of Physics may pursue this minor.**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

**Requirements** * Two required courses PHYS-213 Modern Physics I and PHYS-283 Vibrations and Waves
* A minimum of 9 semester credit hours of additional courses from the listing below where one must be selected from group A and one from group B. Other courses will be considered if they are 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-213 Modern Physics I | 3 | X |  | X | X | Annual | PHYS-212 |
| PHYS-283 Vibrations and Waves | 3 | X |  |  | X | Annual | PHYS-212, MATH-182 |
| PHYS-315 Experiments in Modern Physics | 3 |  | X, Group A | X |  | Annual | PHYS-213 |
| PHYS-316 Advanced Laboratory in Physics | 3 |  | X, Group A |  | X | Annual | PHYS-214,PHYS-315 |
| PHYS-365 Physical Optics | 3 |  | X, Group A |  | X | Annual | PHYS-212; MATH-221 or MATH-219; PHYS-225; PHYS-283; PHYS-320 |
| PHYS-377 Advanced Computational Physics | 3 |  | X, Group A |  | X | Biennial | PHYS-225, PHYS-320 |
| PHYS-214 Modern Physics II | 3 |  | X, Group B | X |  | Annual | PHYS-213 |
| PHYS-320 Mathematical Methods in Physics | 3 |  | X, Group B | X |  | Annual | MATH-219, MATH-231, PHYS-212 |
| PHYS-330 Classical Mechanics | 4 |  | X, Group B | X |  | Annual | MATH-219, MATH-231, PHYS-212 |
| PHYS-411 Electricity and Magnetism | 4 |  | X, Group B |  | X | Annual | PHYS-212; PHYS-320; PHYS-275 or permission of department |
| PHYS-414 Quantum Mechanics | 3 |  | X, Group B | X |  | Annual | PHYS-213, PHYS-320, PHYS-330 |
| PHYS-440 Thermal and Statistical Physics | 3 |  | X, Group B | X |  | Annual | PHYS-213, MATH-231 |
| PHYS-360 Introduction to Chaotic Dynamics in Physics | 3 |  | X, Group B |  | X | Biennial | PHYS-283, PHYS-330 |
| PHYS-408 Laser Physics | 3 |  | X, Group B | X |  | Biennial | PHYS-365 |

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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: | Physics |
| Name of Minor in Quarter Calendar: | Physics |
| 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** |
| 1016-2811016-2821016-283 | Project-based Calculus IProject-based Calculus IIProject-based Calculus III | 444 | MATH-181MATH-182 | Project-based Calculus IProject-based Calculus II | 44 | 1016-281 and part of 1016-2821016-283 and part of 1016-282 |
| 1017-3111017-3121017-313 | University Physics IUniversity Physics IIUniversity Physics III | 554 | PHYS-211PHYS-212 | University Physics IUniversity Physics II | 44 | 1017-311 and part of 1017-3121017-313 and part of 1017-312 |
| 1016-305 | Multivariable Calculus | 4 | MATH-219 | Multivariable Calculus | 3 |  |
| 1017-314 | Modern Physics I | 4 | PHYS-213 | Modern Physics I | 3 |  |
| 1017-318 | Vibrations and Waves | 4 | PHYS-283 | Vibrations and Waves | 3 |  |
| 1017-315 | Modern Physics II | 4 | PHYS-214 | Modern Physics II | 3 |  |
| 1017-3741017-3211017-378 | Experiments in Modern Physics IIntroduction to Lab TechniquesExperiments in Modern Physics II | 242 | PHYS-315PHYS-316 | Experiments in Modern PhysicsAdvanced Laboratory in Physics | 33 | 1017-374 and part of 1017-3211017-378 and part of 1017-321 |
| 1017-4011017-402 | Intermediate Mechanics IIntermediate Mechanics II | 44 | PHYS-330 | Classical Mechanics | 4 | 1017-401 and part of 1017-402 |
| 1017-4111017-412 | Electricity and Magnetism IElectricity and Magnetism II | 44 | PHYS-411 | Electricity and Magnetism  | 4 | 1017-411 and part of 1017-412 |
| 1017-480 | Mathematical Methods in Physics I | 4 | PHYS-320 | Mathematical Methods in Physics | 3 |  |
| 1017-415 | Thermal Physics | 4 | PHYS-440 | Thermal and Statistical Physics | 3 |  |
| 1017-522 | Quantum Mechanics I | 4 | PHYS-414 | Quantum Mechanics | 3 |  |
| 1017-455 | Physical Optics | 4 | PHYS-365 | Physical Optics | 3 |  |
|  |  |  | PHYS-377 | Advanced Computational Physics | 3 |  |
| 1017-435 | Introduction to Chaotic Dynamics in Physics | 4 | PHYS-360 | Introduction to Chaotic Dynamics | 3 |  |
| 1017-566 | Laser Physics | 4 | PHYS-408 | Laser Physics | 3 |  |