**ROCHESTER INSTITUTE OF TECHNOLOGY
MINOR PROGRAM PROPOSAL FORM**



**B. THOMAS GOLISANO COLLEGE OF
COMPUTING AND INFORMATION SCIENCES**

**Name of Certifying Academic Unit; Department of Software Engineering Name of Minor:** Software Engineering

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

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

Students in disciplines which have a heavy reliance on software applications may be interested in pursuing a Minor in Software Engineering. A student taking this minor will deepen his or her software design skills and learn techniques for working on a productive software engineering team. The minor provides a broad view of the software engineering landscape including introductory material, and fundamentals in design and process. The student can maintain that balance in the technical electives he or she chooses, or specialize in either software engineering design or process by taking both electives from one area.

**1.0 Minor Program Approvals**

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| --- | --- | --- |
|  | Approval request date: | Approval granted date: |
| Academic Unit Curriculum Committee | 1/31/2012 | 2/1/2012 |
| College Curriculum Committee | 2/3/2012 | 2/10/2012 |
| Inter-College Curriculum Committee | 2/10/2012 | 2/13/12 |

**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?

The courses in this minor cover the broad principles and practices needed to engineer quality software. This includes an introduction to software engineering, basics in software process and design, and then breadth in software process and software design, or depth in one of those two aspects of software engineering.

**3.0 Multidisciplinary involvement:**

Not applicable

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**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: VSEN – Software Engineering This is the home department for the minor. All of these courses are part of the software engineering program requirements.

**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:

These courses follow the introductory path in the software engineering program starting with a general software engineering course. The student is then required to take the courses that are the gateways to our upper-division courses in software process and software design. The student can then opt for balance by taking one process elective and one design elective, or obtain depth by selecting to take both electives in one of those areas.

The prerequisite for the minor is satisfactory completion of a first-year introductory sequence that includes object-oriented concepts offered by any program in GCCIS. Students may also take CS for Transfers to satisfy the minor prerequisite, noting that this will require careful planning on the part of the student since the course is only offered once a year and has limited registration. Note: the predominate programming language used in SE courses that the student takes as part of the SE minor may differ from the language used in their introductory sequence. It is solely the student's responsibility to gain sufficient expertise in the language used in an SE course to complete assigned coursework.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Course Number & Title | SCH | Required | Optional | Fall | Spring | Annual/ Biennial | Prerequisites |
| SWEN-261 Introduction to Software Engineering | 3 | X |  | X | X | Annual | See narrative above |
| SWEN-262 Engineering of Software Subsystems | 3 | X |  | X | X | Annual | SWEN-261 |
| SWEN-256 Software Process and Project Management | 3 | X |  | X | X | Annual | SWEN-261 |
| SE Minor Elective | 3 | X |  | X | X | Annual | Depending on course SWEN-261, SWEN-262, or SWEN­256 |
| SE Minor Elective | 3 | X |  | X | X | Annual | Depending on course SWEN-261, SWEN-262, or SWEN­256 |

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| --- | --- |
| Total credit hours: | 15 |

**Software Engineering Minor Electives**. The available software engineering courses that a student can take as the two elective courses are listed below. Each course, except the seminars, is offered at least once a year. Each term, software engineering will offer multiple design and process electives.

**Design Electives**

SWEN-331 Secure Software System Development

SWEN-342 Engineering of Concurrent and Distributed Software Systems

SWEN-343 Engineering of Enterprise Software Systems

SWEN-440 Software System Requirements and Architectures

SWEN-444 Human Centered Requirements and Design

SWEN-461 Real Time and Embedded Systems

SWEN-462 Modeling of Real Time Systems

SWEN-463 Performance Engineering of Real Time and Embedded Systems

SWEN-549 Software Engineering Design Seminar

**Process Electives**

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SWEN-350 Software Process and Product Quality SWEN-356 Trends in Software Development Processes SWEN-559 Software Engineering Process Seminar

**Other Electives**

SWEN-220 Mathematical Models of Software SWEN-352 Software Testing

SWEN-590 Software Engineering Seminar

**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: | VMSE Software Engineering |
| Name of Minor in Quarter Calendar: | VMSE Software Engineering |
| Name of Certifying Academic Unit: | Department of Software Engineering |

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| --- | --- | --- |
| **QUARTER: Current MinorCourses** | **SEMESTER: ConvertedMinor Courses** |  |
| Course # | Course Title | QCH | Course # | Course Title | SCH | **Comments** |
| 4010- | Software | 4 | SWEN- | Introduction | 3 |  |
| 361 | Engineering |  | 261 | to Software |  |  |
|  |  |  |  | Engineering |  |  |
| 4010- | Engineering | 4 | SWEN- | Engineering | 3 |  |
| 362 | of Software |  | 261 | of Software |  |  |
|  | Subsystems |  |  | Subsystems |  |  |
| 4010- | Software | 4 | SWEN- | Software | 3 |  |
| 456 | Process and |  | 256 | Process and |  |  |
|  | Project |  |  | Project |  |  |
|  | Management |  |  | Management |  |  |
| 4010- | Methods of | 4 | SWEN- | Mathematical | 3 |  |
| 420 | Specification and Design |  | 220 | Models of Software |  |  |

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| **QUARTER: Current MinorCourses** | **SEMESTER: ConvertedMinor Courses** |  |
| 4010- | Principles of | 4 | SWEN- | Engineering | 3 |  |
| 443 | Information |  | 343 | of Enterprise |  |  |
|  | System |  |  | Software |  |  |
|  | Design |  |  | Systems |  |  |
| 4010- | Software | 4 | SWEN- | Software | 3 |  |
| 450 | Process and |  | 350 | Process and |  |  |
|  | Product |  |  | Product |  |  |
|  | Quality |  |  | Quality |  |  |
| 4010- | Software | 4 | SWEN- | Software | 3 |  |
| 452 | Testing |  | 352 | Testing |  |  |
| 4010- | Agile | 4 | SWEN- | Trends in | 3 |  |
| 556 | Software |  | 356 | Software |  |  |
|  | Development |  |  | Development |  |  |
|  |  |  |  | Processes |  |  |
| 4010- | Engineering | 4 | SWEN- | Human | 3 |  |
| 444 | Methods for |  | 444 | Centered |  |  |
|  | Software Usability |  |  | Requirements and Design |  |  |
| 4010- | Real-Time | 4 | SWEN- | Real Time | 3 |  |
| 461 | and |  | 461 | and |  |  |
|  | Embedded |  |  | Embedded |  |  |
|  | Systems |  |  | Systems |  |  |
| 4010- | Modeling of | 4 | SWEN- | Modeling of | 3 |  |
| 462 | Real-Time |  | 462 | Real Time |  |  |
|  | Systems |  |  | Systems |  |  |
| 4010- | Performance | 4 | SWEN- | Performance | 3 |  |
| 463 | Engineering of Real-Time and |  | 463 | Engineering of Real Time and |  |  |
|  | Embedded |  |  | Embedded |  |  |
|  | Systems |  |  | Systems |  |  |
| 4010- | HW-SW Co- | 4 | SWEN- | Hardware- | 3 |  |
| 549 | Design for |  | 467 | Software Co‑ |  |  |
|  | Cryptographic |  |  | Design for |  |  |
|  | Applications |  |  | Cryptographic |  |  |
|  |  |  |  | Applications |  |  |
| 4010- | Seminar in | 4 | SWEN- | Software | 3 |  |
| 549 | Software |  | 549 | Engineering |  |  |
|  | Engineering |  |  | Design |  |  |
|  | Design |  |  | Seminar |  |  |
| 4010- | Seminar in | 4 | SWEN- | Software | 3 |  |
| 559 | Software |  | 559 | Engineering |  |  |
|  | Engineering |  |  | Process |  |  |
|  | Process |  |  | Seminar |  |  |
| 4010- | Software | 4 | SWEN- | Software | 3 |  |
| 590 | Engineering |  | 590 | Engineering |  |  |
|  | Seminar |  |  | Seminar |  |  |
| 4010- | Principles of | 4 |  |  |  | Deleted quarter course that is valid as SE |
| 441 | Concurrent |  |  |  |  | Minor elective |
|  | Software |  |  |  |  |  |
|  | Systems |  |  |  |  |  |
| 4010- | Principles of | 4 |  |  |  | Deleted quarter course that is valid as SE |
| 442 | Distributed |  |  |  |  | Minor elective |
|  | Software |  |  |  |  |  |
|  | Systems |  |  |  |  |  |
| 4010- | Principles of | 4 |  |  |  | Deleted quarter course that is valid as SE |
| 540 | Software |  |  |  |  | Minor elective |
|  | Architecture and Design |  |  |  |  |  |

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| **QUARTER: Current Minor** | **SEMESTER: Converted** |  |
| **Courses** | **Minor Courses** |  |
| 4010- | Software | 4 |  |  |  | Deleted quarter course that is valid as SE |
| 555 | Requirements |  |  |  |  | Minor elective |
|  | Engineering |  |  |  |  |  |

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

a. 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;

b. 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.

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c. 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.

d. 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.