University of Wisconsin-Whitewater

Curriculum Proposal Form #3

## New Course

**Effective Term:**

**Subject Area - Course Number:** **COMPSCI 451 Cross-listing:** **N/A**

(See Note #1 below)

**Course Title:** (Limited to 65 characters) Topics in Modern Applied Computing

**25-Character Abbreviation:** Topics in Applied CS

**Sponsor(s):** Dr. Hien Nguyen and Dr. Lopa Mukherjee

**Department(s):** Mathematical and Computer Sciences

**College(s):**

# **Consultation took place**: [x]  NA [ ]  Yes (list departments and attach consultation sheet)

Departments:

**Programs Affected:** **Computer Science**

**Is paperwork complete for those programs?** (Use "Form 2" for Catalog & Academic Report updates)

[ ]  NA [x]  Yes [ ]  will be at future meeting

**Prerequisites:** COMPSCI 271 and either MCS 231 or COMPSCI 223

**Grade Basis:** [x]  Conventional Letter [x]  S/NC or Pass/Fail

**Course will be offered:** [x]  Part of Load [ ]  Above Load

 [x]  On Campus [ ]  Off Campus - Location

**College:**  **Dept/Area(s):** Math and Computer Sciences

**Instructor:** Dr. Hien Nguyen and Dr. Lopa Mukherjee

 *Note: If the course is dual-listed, instructor must be a member of Grad Faculty.*

**Check if the Course is to Meet Any of the Following:**

[ ]  Technological Literacy Requirement [ ]  Writing Requirement

[ ]  Diversity [ ]  General Education Option:

Note: For the Gen Ed option, the proposal should address how this course relates to specific core courses, meets the goals of General Education in providing breadth, and incorporates scholarship in the appropriate field relating to women and gender.

**Credit/Contact Hours:** (per semester)

Total lab hours: 0 Total lecture hours: 48

Number of credits: 3 Total contact hours: 48

**Can course be taken more than once for credit? (Repeatability)**

[x]  No [ ]  Yes If "Yes", answer the following questions:

No of times in major:       No of credits in major:

No of times in degree:       No of credits in degree:

Proposal Information: ([***Procedures for form #3***](http://acadaff.uww.edu/UCC/Curriculum_Handbook_09/Procedures_form3.docx))

**Course justification:**

This course is one of the courses in the group Applied Computing in the newly proposed Computer Science major. As new technology in Computer Science change rapidly and frequently, we design this course to enable instructors to introduce the interesting and cutting edge topic in addition to traditional computer science courses. This course is also very valuable for students in the Management Computer Systems program, Multimedia Art and Game Development and the Computer Science minor to broaden their views in core areas of computer science by exposing them to different topics in Computer Sciences.

**Relationship to program assessment objectives:**

The Assessment Committee in the Department of Mathematical and Computer Sciences has identified 5 universal objectives that address cognitive processes involved in learning math and computing topics. They are Analytical Reasoning, Conceptual/Foundational Understanding, Pattern Recognition, Problem Solving, and Synthesis. Adding the course “Topics in Modern Applied Computing” will help strengthen four of these assessment objectives. Specifically,

(1) Conceptual/Foundational Understanding - students will have a chance to strengthen their knowledge and skills in Computer Sciences by understanding and applying foundational concepts in Computer Sciences to different applications, and different domains.

(2) Pattern Recognition - this course helps students to recognize how their fundamental concepts in Computer Sciences are applied in empirical and theoretical applications and topics.

(3) Problem solving - is emphasized throughout the course starting with the definition of various problems that relate to Modern Computing and reiterated with projects in which students pick one special problem and develop a computing solution to solve it.

(4) Synthesis - this course brings conceptual understanding and specific implementation skills together in solving a problem related to applied computing.

**Budgetary impact:**

**Staffing:** Many members of the current Computer Science staff have the expertise necessary to staff this course. It is anticipated that Dr. Hien Nguyen and Dr. Lopa Mukherjee will initially be the instructors. There will be three new courses introduced for that major, and the department will cover these courses as part of its load. These new courses will require between three to four additional course sections being offered each year as part of the new major, and the half FTE required will be covered by a promised new half FTE from the College of Letters and Sciences. Computer laboratory space on campus is already sufficient to run this course. The Computer Science budget is being increased slightly to cover any new software required.

**Academic unit library and service & supply budget:**

It is not anticipated that this course will affect the department’s service & supply or library budget.

**Impact on campus instructional resource units:** This course will likely enter into the rotation with existing high level courses in Computer Sciences. If the proposal of the Computer Science major is approved, this course will serve as one of the elective courses in the area Applied Computing for this major.

**Laboratory facilities:** adequate lecture space is available. This course can be taught in any classroom or lab rooms such as McGraw 115 or Hyer 210.

**Course description:** (50 word limit)

This course covers Modern Applied computing which includes programming on new platforms such as mobile devices, network security, wireless networks, data mining and recommender systems, user modeling, human computer interactions. Students will discuss papers or books related to the chosen topic, design and/or develop an application related to the topic.

**Course objectives and tentative course syllabus:**

Course information, objectives, weekly description, grade information (page 4-5), and bibliography (page 6).

**COMPSCI 451: Topics in Applied Computing**

# **Required Texts**:

# **There is no pre-chosen text required for this course. Depending on each topic, the instructor will choose a book and/or a set of papers for the students to read and discuss.**

# **Course Description**

This course covers the important topics in Modern Applied computing which includes but not limit to programming on new platforms such as mobile devices [1], network security [2,3], wireless networks [4], data mining and recommender systems [5], user modeling [6], human computer interactions [7]. Students will discuss a set of papers or books related to the chosen topic, design and/or develop an application that related to the topic.

Prerequisite: Core courses of Computer Sciences major

# **Course Objectives**

|  |  |
| --- | --- |
| 1 | Students will be able to define a problem in a specific domain and application area that relate to the special topic discussed in this class. |
| 2 | Students will be able to design and develop a solution to solve the problem defined in objective 1. |

# **Possible** **topics** **and** **textbooks**

|  |  |
| --- | --- |
| **Topics** | **Text books** |
| Mobile computing | Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML. Reza B’Far. Cambridge University Press. 2004. |
| Network security | Network Security Essentials: Applications and Standards (4th Edition). William Stallings. Prentice Hall (4 edition). 2010 |
| Ad Hoc and wireless networks | Ad Hoc Wireless Networks: Architectures and Protocols. C. Siva Ram Murthy. Prentice Hall, 2004. |
| Data mining | Data Mining: Concepts and Techniques. Jiawei Han and Micheline Kamber. Morgan Kaufmman Publishers, 2005. |
| Human Computer Interaction | Designing the User Interface: Strategies for Effective Human-Computer Interaction (5th edition). Ben Shneiderman, Catherine Plaisant, Maxine Cohen and Steven Jacobs. Addison Wesley. 2009.  |

# **TentativeCourseSchedule**

|  |  |  |  |
| --- | --- | --- | --- |
| **WEEK** | **READINGS Assignment**  | **Description** | **Presentation/Project/Exams** |
| 1 |  | Syllabus, Class Introduction, Review of Fundamental concepts in Computer Sciences that relate to the main topic |  |
| 2 | Reading set 1 | Problem definition | Presentation. Paper assigned |
| 3 | Reading set 2 | Discussion of the challenges and current approaches | Presentation |
| 4 | Reading set 3 | Discussion of current approaches | Presentation |
| 5 | Reading set 4 | Discussion of current approaches (continue) | Presentation |
| 6 | Reading set 5 | Discussion of possible projects. | Presentation |
| 7 | Reading set 6 | Discussion of evaluation methods | Presentation |
| **8** |  | **Paper due** |  |
| 9 |  | Project formulation |  |
| 10 |  | Project discussion |  |
| 11 |  | Project discussion |  |
| 12 |  | Project discussion |  |
| 13 |  | Project discussion |  |
| 14 |  | Project presentation |  |
| 15 |  | Project presentation |  |

# **Grading** **Policy**

|  |  |
| --- | --- |
| **GRADABLE** | **Percentage** |
| Project development | 40% |
| Project presentation | 10% |
| Paper/book review | 20% |
| Paper | 30% |
| **Total** | **100%** |

|  |  |  |  |
| --- | --- | --- | --- |
|  **Letter Grade**  | **Percentage** | **Letter Grade** | **Percentage** |
| **A** | **94 to 100%** | **A-** | **90 to 93%** |
| **B+** | **87 to 89%** | **B** | **84 to 86%** |
| **B-** | **80 to 83%** | **C+** | **77 to 79%** |
| **C** | **74 to 76%** | **C-** | **70 to 73%** |
| **D+** | **67 to 69%** | **D** | **64 to 66%** |
| **D-** | **60 to 63%** | **F** | **Less than 60%** |

***Attendance and participation:***

Class participation is very important and will be based on class attendance, punctuality, ability to contribute in class discussions, answer questions and coming prepared to class with assigned readings. All students are expected to prepare for and participate in all of classes except absences for university-sponsored events, absences caused by medical reasons in which cases, doctor’s notes are required, or absences by family emergencies which will be determined on case-by-case basis.

***Absence for University-Sponsored Events:***

University policy adopted by Faculty Senate and the Whitewater Student Government states that students will not be academically penalized for missing class in order to participate in university-sanctioned events. They will be provided an opportunity to make up any work that is missed; and if class attendance is a requirement, missing a class in order to participate in a university-sanctioned event will not be counted as an absence. A university-sanctioned event is defined to be any intercollegiate athletic contest or other such event as determined by the Provost. Activity sponsors are responsible for obtaining the Provost’s prior approval of an event as being university-sanctioned and for providing an official list of participants. Students are responsible for notifying their instructors in advance of their participation in such events.

**Technology requirement**

This will be chosen specifically for each topic.

**Bibliography:**

1. <http://unex.uci.edu/courses/sectiondetail.aspx?year=2011&term=Winter&sid=00118>
2. <http://inst.eecs.berkeley.edu/~cs161/fa08/>
3. <http://crypto.stanford.edu/cs155/>
4. <http://www.cs.utexas.edu/users/ygz/395T/>
5. <http://www.eas.asu.edu/~mining03/>
6. <http://nth.wpi.edu/classes/userModeling2010.htm>
7. <http://www.cs.vt.edu/undergraduate/courses/CS3724>