University of Wisconsin-Whitewater

Curriculum Proposal Form #4A

# **Change in an Existing Course**

Type of Action (check all that apply)

Course Revision (*include course description &former and newsyllabus)*  Grade Basis

Contact Hour Change and or Credit Change  Repeatability Change

Diversity Option  Other:

General Education Option

area: **\***

\*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.

**Effective Term**:

**Current Course Number**(*subject area and 3-digit course number*):COMPSCI 271

**CurrentCourse Title**: Assembly Programming

**Sponsor(s)**: Lopamudra Mukherjee

**Department(s):** Math And Computer Science

**College(s):**

**List all programs that are affected by this change:**

If programs are listed above, will this change affect the Catalog and Advising Reports for those programs? If so, have Form 2's been submitted for each of those programs?

(Form 2 is necessary to provide updates to the Catalog and Advising Reports)

NA  Yes  They will be submitted in the future

Proposal Information: ([***Procedures for form #4A***](http://www.uww.edu/acadaff/ucc/Procedures_form4A.docx))

1. **Detailed explanation of changes** (use FROM/TO format)

***FROM:***

In this course, students gain knowledge in PC hardware, and in using assembly language, including what needed to write, link and execute a program written in assembly language.  Main concepts including the pure automatic formal logic machine, instruction addressing and execution, computer memory, basics of assembly language, linking and running a program will be addressed. In addition, the course examines program logic and control, stack, string and numeric processing.

***TO:***

This course covers PC hardware and the use of an assembly language including writing, linking, and executing a programs. Also covered are number systems, the 8086 processor, instructions for arithmetic and logical operations, memory access, loops, declaring variables, and using interrupts, machine language, segments, stacks, procedure writing, and file handling.

## Justification for action

As recommended by the outside reviewers of the new major in Computer Science, we are consolidating our three Systems Programming courses: CS 271 (Assembly Language Programming), CS 302 (Computer Logic and Microprocessors), and CS 412(Computer Organization and System Programming) into two courses: CS 271 and CS 412. CS 271’s syllabus has been adapted to include some content from CS 302 (mainly number systems, first bulleted topic above) and some of the material from CS 412 (mainly translation to machine language).

**Bibliography**

1. Carter, P. A. (n.d.). *PC Assembly Language.* 2003.
2. Detmer, R. C. (2006). *Essentials of 80x86 Assembly Language.*
3. Hennessy, P. a. (2008). *Computer Organization and Design.* Morgan Kaufmann.
4. Hyde, R. (2003). *The Art of Assembly Language.* pollack.
5. Irvine, K. (2011). *Assembly Language for X86 Processors.* Prentice Hall.
6. **Syllabus/outline**(if course revision, include former syllabus and new syllabus)

OLD SYLLABUS

**COMPSCI 271-01 Fall 2011**

**Assembly Programming**

**TR 12:30-1:45pm Hyer 210**

**Instructor:** Lopamudra Mukherjee

**Office:**  McGraw 107

**Office Phone:** (262) 472-5160(office)

**E-Mail:** [mukherjl@uww.edu](mailto:maj@uww.edu)

**Personal Website:** http://math.uww.edu/~mukherjl/

**Course Webpage:**Check Desire2Learn

**Office Hours:** McGraw Hall 107,

Tuesday 4 - 5:30pm

Thursday 1:45 - 6pm

And also by appointment. I will be available at all times by email.

**Text**: *IBM PC Assembly Language and Programming.* Peter Abel. 2001. Fifth Edition. Prentice Hall. ISBN: 0-13-030655-X

**Prerequisite**:

COMPSCI 171 or consent from the instructor. A student may not register for any course which is a pre-requisite for another course in which credit has been earned unless prior departmental approval is obtained.

**Course Description**:

In this course, students gain knowledge in PC hardware, and in using assembly language, including what needed to write, link and execute a program written in assembly language.  Main concepts including the pure automatic formal logic machine, instruction addressing and execution, computer memory, basics of assembly language, linking and running a program will be addressed. In addition, the course examines program logic and control, stack, string and numeric processing.

**Grading Policy**:

Homework 15%

Quizzes 35%

Midterm Exam 20%

Final Exam 30%

Tentative grading scheme.A: 94-100%, A-:90-93% B+ : 87-89%, B: 84-86%, B-: 80-83%C+ : 77-79%, C: 74-76%, C-: 70-73%D+ : 67-69%, D: 64-66%, D-: 60-63%, F < 60%

**COURSE REQUIREMENTS:**

1. Students are expected to attend all classes and complete all classwork and homework.

2. All assignments/programs are due at the BEGINNING of the class period on the assigned date. Late assignments or programs will be docked 20% per class day.

**Religious Beliefs Accommodation**:

Board of Regents policy states that students' sincerely held religious beliefs shall be reasonably accommodated with respect to scheduling all examinations and other academic requirements. Students must notify the instructor, within the first three weeks of the beginning classes of the specific days or dates on which they will request accommodation.

**Absence For University Sponsored Events**:

Students will not be academically penalized for missing class (exam) in order to participate in university sanctioned events. They will be provided an opportunity to make up any work that is missed.

**Academic Misconduct:**

No form of academic misconduct will be tolerated in this course. Students engaged in any form of academic misconduct will experience the full force of the law as reported in UWS chapter 14.

**Required Syllabi Statement**:

The University of Wisconsin-Whitewater is dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all undergraduate and graduate students to familiarize themselves with University policies regarding Special Accommodations, Misconduct, Religious Beliefs Accommodation, Discrimination and Absence for University Sponsored Events. (For details please refer to the Undergraduate and Graduate Timetables; the "Rights and Responsibilities" section of the Undergraduate Bulletin; the Academic Requirements and Policies and the Facilities and Services sections of the Graduate Bulletin; and the "Student Academic Disciplinary Procedures" [UWS Chapter 14]; and the

"Student Nonacademic Disciplinary Procedures" [UWS Chapter 17]).

NEW SYLLABUS

**COMPSCI 271-01**

**Assembly Programming**

**TR 12:30-1:45pm Hyer 210**

**Instructor:** Lopamudra Mukherjee

**Office:**  McGraw 107

**Office Phone:** (262) 472-5160(office)

**E-Mail:**  [mukherjl@uww.edu](mailto:maj@uww.edu)

**Personal Website:** http://math.uww.edu/~mukherjl/

**Course Webpage:** Check Desire2Learn

**Office Hours:**  McGraw Hall 107,

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**Prerequisite**:

COMPSCI 171 or consent from the instructor. A student may not register for any course which is a pre-requisite for another course in which credit has been earned unless prior departmental approval is obtained.

**Course Description**:

In this course, students gain knowledge in PC hardware, and in using assembly language, including what needed to write, link and execute a program written in assembly language.  Main concepts cover

* Number systems (binary, octal, hexadecimal, general base), their conversions and arithmetic in each base. Binary coded decimal will also be covered.
* Underlying architecture of 8086 including its registers and memory addressing
* Assembly language instructions for arithmetic and logical operations, memory access, loops, declaring variables, and using interrupts.
* Translation for assembly to machine language: 8086 instruction set architecture
* Segments and Use of Stack
* Procedure writing
* File and string handling

**Weekly Schedule**

|  |  |
| --- | --- |
| Week 1 | Introduction to number systems, conversion between decimal, octal, hexadecimal |
| Week 2 | Arithmetic using binary, hexadecimal, BCD |
| Week 3 | Underlying architecture of 8086 including its registers and memory addressing |
| Week 4 | Translation for assembly to machine language: 8086 instruction set architecture |
| Week 5 | Data Transfer and Arithmetic Instructions |
| Week 6 | Declaring Variables and Arrays |
| Week 7 | Loop Instructions and Flags |
| Week 8 | 8086 Interrupts, particularly Int 10h and Int 21h |
| Week 9 | Logical Functions and Instructions |
| Week 10 | Segments |
| Week 11 | Use of Stack |
| Week 12 | Writing Procedures |
| Week 13 | Recursion |
| Week 14 | Advanced String Handling |
| Week 15 | File handling |

**Grading Policy**:

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Quizzes 35%

Midterm Exam 20%

Final Exam 30%

Tentative grading scheme. A: 94-100%, A-:90-93% B+ : 87-89%, B: 84-86%, B-: 80-83% C+ : 77-79%, C: 74-76%, C-: 70-73% D+ : 67-69%, D: 64-66%, D-: 60-63%, F < 60%

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"Student Nonacademic Disciplinary Procedures" [UWS Chapter 17]).