University of South Carolina Upstate
New Course Request

School, division, or other: Division of Mathematics and Computer Science

Discipline and course number: SMTH 255

Proposed course title: MATLAB Programming

The course schedule listing is limited to 23 characters. List how the course should be listed in the schedule using 23 characters or less.

MATLAB PROGRAMMING

Credit (sem. hrs.) 3 Grading system: X standard pass/fail

Prerequisites SMTH 141 or consent of instructor

Corequisites

Proposed description (list description as it will appear in the catalog; include number, title, description, credit hours and prerequisites or corequisites; see guidelines below):

SMTH 255. MATLAB Programming (3) Programming language and techniques designed specifically for programs that rely on the application of mathematics for solution. Topics include variables, assignment statements, expressions, vectors and matrices, MATLAB scripts, input and output, selection statements, flow control, program organization, M-files, optimizing M-files, string manipulations, data structures, advanced functions, plotting, symbolic math toolboxes, variable precision arithmetic, and tricks and tips in MATLAB programming. Prerequisites: SMTH 141 or consent of instructor.

Proposed instructor(s) Alex Timonov

Alternate instructor(s) Muhammad Hameed

Estimated enrollment: 10-15 Semester(s) to be taught: Fall

YES A statement of justification is attached.

NO A listing of new equipment and special facilities required for this course is attached.

NO Paperwork has been submitted to the General Education Committee to have this new course approved as part of the General Education Curriculum.

Guidelines for Course Descriptions:

1. The description should begin with a sentence fragment which summarizes the course content.
2. A second complete sentence may be used to provide more detail. Verb tense must be present.
3. Among the words and phrases that should be avoided are the following:
   - This course a course will be discussed study of designed to an examination of students examines an analysis of
   - Redundancy in the title and course description should be avoided.
4. Statement of the number of hours per week that a course meets should be avoided when it is the same as credit hours.

Course Numbering Policy:

1. A four letter prefix precedes each course number. Each course is identified with a three digit number. The tens place digit and the ones place digit are used by disciplines to organize courses in logical sequence or in clusters.
2. Each discipline in the University uses a specific prefix to designate course within that discipline. All University of South Carolina Upstate course prefixes start with the letter "SM".
3. Courses from 101 to 599 may be taken for undergraduate credit and are available at different levels for undergraduate students.
4. Courses numbered from 101 through 299 are primarily taken by students with freshman and sophomore standing.
5. Courses numbered from 300 through 499 are primarily taken by students with sophomore and junior standing.
6. Courses numbered from 300 through 499 are primarily taken by students with junior and senior standing.
7. Courses numbered from 400 through 599 are primarily taken by students with senior standing.
8. Upper division courses are numbered from 300 to 599.
9. With consent of the advisor, a student may take courses numbered above or below the level normally taken by that student's class (freshman, sophomore, junior, or senior).
10. Generally, course prerequisites should be numbered with a lower number than the course for which it is a prerequisite.

Routing: (1) Dean of the Library, (2) Vice Chancellor for Information Systems, (3) Division/School Academic Affairs Committee, (4) Assistant Dean or Division Chair, (5) School or College Dean, (6) Registrar, (7) Executive Academic Affairs Committee, (8) Faculty Advisory Committee, (9) Faculty Senate, (10) Vice Chancellor for Academic Affairs.

*These editorial guidelines have been approved by the Vice Chancellor for Academic Affairs for use by the Registrar.

Approved by Faculty Senate 5-1999

C: Katy Murphy Beverly Johnson Star Jamison Passed at 2/25/99 Senate Mtg.
New Course Request, Proposed course title: MATLAB Programming
(from previous page)

The current library support is □ not □ adequate for this course.

The Dean of the Library (Signature) Date: 25-Feb-2011

Present computer support is □ not □ adequate for this course. (Signature of the Vice Chancellor for Information Systems is required only if computer support is necessary for this course.)

Vice Chancellor for Information Systems (Signature) Date: 2/15/2011

Notifications

Signatures in this section indicate awareness of the proposal. Proposals signed with a notation of recommended or not recommended may be forwarded to the Executive Academic Affairs Committee for consideration. Proposals that are not signed after ten full working days by the school or division academic affairs committee chair, the division chair, or the college or school dean may be forwarded without signatures (on the initiative of those making the proposal) to the next level of review.

Signature of Division/School Academic Affairs Committee Chairperson

Recommended □ Not recommended □ Date: 12/2/10

Signature of Assistant Dean or Division Chairperson

Recommended □ Not recommended □ Date: 12/2/2010

Current Resources Adequate □ Not Adequate □

Signature of School or College Dean

Recommended □ Not recommended □ Date: 12/8/2010

Current Resources Adequate □ Not Adequate □

__________________________
Signature of Registrar

Date: 12/21/11

This proposal has been submitted to the Executive Academic Affairs Committee.

Signature of Executive Academic Affairs Committee Chairperson

Recommended □ Not recommended □ Date: 1/7/11

Approvals

This proposal has been submitted to the Faculty Senate.

Signature of Faculty Chair

Approved □ Disapproved □ Date: 2/28/11

Signature of Vice Chancellor for Academic Affairs

Approved □ Disapproved □ Date: 3/1/11

Routing: (1) Dean of the Library, (2) Vice Chancellor for Information Systems, (3) Division/School Academic Affairs Committee, (4) Assistant Dean or Division Chair, (5) School or College Dean, (6) Registrar, (7) Executive Academic Affairs Committee, (8) Faculty Advisory Committee, (9) Faculty Senate, (10) Vice Chancellor for Academic Affairs.

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*Approved by Faculty Senate 5-1999
STATEMENT OF JUSTIFICATION: The following is a set of questions intended to serve as guidelines for expressing both the need and justification for the new course. These questions represent relevant criteria for assessing the merit of a course addition. Many of these questions may be answered quite briefly; others, however, require a more extended response. The following convention should be adopted throughout. Responses to these questions should be identified in the text of the statement by means of the number index provided.

A. CONTENT, OBJECTIVES, METHODS

(A1) What general topics would be central for the content of this course?
Sophisticated data structures, built-in debugging and profiling tools and object-oriented programming make MATLAB an excellent very high-level language for teaching and powerful tool for research and practical problem solving. Therefore, these topics are central for the content of the proposed course.

(A2) What are the intended objectives for this course?
The main objective is to teach basic MATLAB programming and to develop programming skills needed for numerical problem solving and research in computational and applied mathematics.

(A3) What would this course contribute to the university?
The proposed course may contribute to the University in two ways. First, serving the basic and advanced courses and especially courses included in the Computational and Applied Mathematics concentration, MATLAB Programming would provide the mathematics and computer science majors with an efficient programming tool for mathematical modeling and scientific computing. Second, it is expected that this course attracts more students with any other major who wish to extend their programming skills.

(A4) Are there any laboratory and/or recitation periods required or recommended for this course? Describe. Are present facilities adequate to meet this demand?
Yes, such periods are recommended. The present facilities, i.e., several computer classes in the Hodge building including the Math tutorial lab, are adequate to provide both the efficient study of MATLAB programming and laboratory periods. The class rooms are equipped with a number of PCs, and the MCS division holds a MATLAB software license for up to 20 students.

(A5) If present library holdings are not adequate to support this course, what plans are there to address the inadequacy of the library holdings?
Although the inadequacy of the library holdings is expected, it shall not affect the quality of teaching since there is a number of journal articles, program libraries, etc., available on-line. The proposed course is constructed in a way that provides the students with the necessary materials available through the internet.

(A6) List textbook(s), suggested readings, materials.

(A7) At what level should this course be characterized: lower or upper division? If upper level, provide a brief justification.
This is a lower level course.

B. INSTRUCTOR

(B1) What experience, relevant background, or training do the proposed and alternate instructors have in teaching the content of this course?
The proposed instructor is Alex Timonov. He has more than the twenty years experience of teaching and advanced research in computational and applied mathematics involving high-level programming languages, such as FORTRAN, MATLAB, IDL, etc. The alternative instructor is Muhammad Hameed who has the eight years experience of using MATLAB in research.
C. MAJOR PROGRAMS AND DIVISIONAL CURRICULUM

(C1) What role does it serve in the specified requirements for the major? If the proposed course is not part of an existing major, are there any plans for a new degree program? Specify.

The MATLAB Programming is introduced as a supporting course for all existing concentrations included in the revised curriculum for an existing major in mathematics. It provides an efficient interactive programming tool for studying the required mathematics courses, such as Calculus (all levels), Elementary Differential Equations, Linear Algebra, Applied PDEs, Elements of Optimization, Numerical Analysis, Theory of Discrete Mathematics, Topics in Mathematics, and Senior Seminar, etc.

(C2) Does it introduce or contribute to some intended area of concentration of specialization within the major? Describe.

The proposed course contributes substantially to the newly established concentrations “Computational and Applied Mathematics” and “Applied Statistics” within the major in mathematics.

(C3) Was this proposal approved by members within the unit?

The proposal has been approved by members within the MCS division.

(C4) Specify in which semester(s) it will be regularly offered, and which of these offerings will be in the day and/or evening.

The proposed course shall be regularly offered in the fall semester.

D. UNIVERSITY CURRICULUM

(D1) In view of its content and objectives, what general university audience would this course serve?

The proposed course is intended not only for the mathematics and computer science majors, but also for the students with any other specialization who may want to improve their programming skills. As some examples of such specializations, one may indicate physics, chemistry, biology, engineering, computer science technology, business administration and finance, forensic, nursing, etc.

(D2) What other existing course(s) does it complement in content?

MATLAB Programming complements the existing courses in programming adopted by the computer science program, such as SCSC 139: Visual BASIC Programming and SCSC 238: C++ Programming.

(D3) What role would it have in the requirements for existing degree programs of other disciplines?

The course will not have an effect on the requirements for existing degree programs in other disciplines. Mathematics and computer science majors will take this course to study an efficient applied programming tool, which is MATLAB.

(D4) How have you contacted affected units about the new course?

The course has been discussed and approved by the MCS faculty members.