THE OHIO STATE UNIVERSITY

College of Engineering

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March 23, 2020

Randy Smith, Vice Provost for Academic Programs
Office of Academic Affairs

Re: Certificate of Completion, Workforce Development Training Programs

Dear Randy,

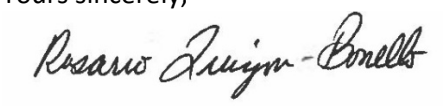
Attached are two Workforce Development Training programs that were submitted by the College of Engineering Professional and Distance Education Programs. The proposals were presented during the College Committee on Academic Affairs (CCAA) meeting conducted via CarmenZoom on March 20, 2020.

1. **Coding Boot Camp**
   A twenty-four week program that combines front-end and back-end web development, big-picture training, both theory and application, and exposes participants to both individual and group-based challenges in order to teach the importance of teamwork.

2. **MATLAB Programming for Engineers**
   The program, to be completed within fourteen weeks, will provide working engineers with the in-depth knowledge of the MATLAB programming language and built-in numerical analysis capabilities needed to solve real engineering problems.

This letter is to inform you that CCAA unanimously approved both programs.

Yours sincerely,



Rosario Quinzon-Bonello M.Ed.
Assistant Dean for Curriculum and Assessment
College of Engineering

College of Engineering

Proposal for a Non-Credit, Online Certificate of Completion
Work Force Development Training Course

"MATLAB Programming for Engineers"

February 21, 2020

OAA Certificate Program Category: (4) Workforce Development Certificate of Completion Programs

Description
MATLAB is widely used in industry for data analysis, simulation and other areas of engineering computation, but it is typically not covered in academic coursework or online courses beyond an introductory level. The "MATLAB Programming for Engineering" course will provide working engineers with the in-depth knowledge of the MATLAB programming language and built-in numerical analysis capabilities needed to solve real engineering problems. This course is intended for practicing engineers who want to use MATLAB as a practical problem solving tool.

The course will be delivered in 100% online asynchronous format. Participants must successfully complete the course within a fourteen week period in order to obtain the certificate of completion. The course is developed by Dr. James Toney and Dr. Adithya Jayakumar from the Engineering Education Department and delivered through the Professional and Distance Education Programs Office, College of Engineering.

This online course will be offered each Autumn and Spring semester with the first offering Autumn 2020.

Stand-alone Program and Maximum Credit Overlap between Academic Certificate and Other Academic Programs
This is a non-credit, online course and will be a stand-alone program.

Maximum Credit Overlap with Degree Program
N/A

Minimum Acceptable Grade to Apply
N/A

Transfer Credit
N/A

EM Credit
N/A

Outcomes-based
Upon completion of the course participants will be able to:

1. Write, test and debug moderately complex MATLAB programs using modern, structured programming methods, including graphical user interfaces
2. Use MATLAB to analyze and represent data
3. Use MATLAB's built-in capabilities to solve engineering problems involving systems of linear equations, ordinary differential equations, and optimization

Curriculum and Credits
The non-credit course will include these topics:

1. The MATLAB environment, Scalars, scripts, built-in functions
    a. Array and Data Analysis
        i. Creating and Indexing Arrays
        ii. Numerical Array Operations
        iii. Logical Array Operations
            1. Reading Data from Files
2. User-defined Functions and Program Structure
    a. Input / Output
    b. External functions
    c. Branching
    d. Loops
    e. Local Functions, Global Variables
    f. Testing and Debugging
3. Data Structures
    a. Cell arrays
    b. Structs and struct arrays
4. Interactive Programming
    a. Dialog Boxes, Message Boxes, File Dialog, Images
    b. Graphical Object Handles
    c. GUIs
5. Numerical Analysis
    a. Curve fitting and Interpolation
    b. Solving Systems of Linear Equations
    c. Solving Ordinary Differential Equations
    d. Optimization and Linear Programming
    e. Linking MATLAB to Simulink

The instructional material for the course will consist of approximately 12-13 hours of recorded online instruction and 24-26 hours of additional coursework for a total of approximately 40 hours. The course will be fourteen weeks in length and offered during the autumn and spring semesters.

The course will be delivered 100% online and asynchronously. Participants will progress through the course at their own pace but they must complete all of the course work within the fourteen week period.

The instructors will participate in each course offering and providing support to participants and be available to answer questions using email, discussion boards, or Zoom meetings if requested.

If participants do not already have access to MATLAB software or through their employer for example, the course structure will allow the use of an open-source equivalent such as Octave or Scilab.

Admission
The assumed background is an elementary understanding of computer programming in any language, and undergraduate-level knowledge of basic engineering physics and math.

Arranged/Individual Study Courses
None.

Minimum Grades and GPA to Complete Program
Participants must achieve an overall average of 70% for all exercises and final quiz to achieve a "Pass" and certificate of completion. No letter grade assigned.

Recorded in the Student Information System (SIS)
No

Regular OSU Tuition and Fee Assessment
No, this is a non-credit course. Fee will be $799 per person.

Eligibility for Federal Pell Grant and Direct Student Loans
No

Diploma Issued
No.

Type of Completion Document Issued
A certificate of completion will be provided after a participant successfully completes the course.

Proposal Contact Information

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