INT180 - Introduction to Composites

BASIC INFORMATION
Requester(s): Karen L Whitney
Holly Moore
College: South Seattle Community College
Division/Dept: Apprenticeship-GT Campus
Dean: Holly Moore

COURSE INFORMATION
Proposed Course Number:
Prefix: INT
Number: 180
Request a new Prefix
This will be a common course

Full Title: Introduction to Composites
Abbreviated Title: Intro to Composites

Catalog Course Description:
The course is a materials science class where students learn about the properties and processing of solid materials used in manufacturing. Introduces students to composite materials in general and focuses on a variety of materials used in manufacturing (ceramics, metals, and fiber reinforced polymer composites) through classroom and lab activities. Students will learn about the properties and the manufacturing techniques of composite fabrications used in manufacturing through classroom and lab.

Course Length: 11 Weeks
Request an Exception

Topical Outline:

I. Introduction to Composites – An Exploration of FRC Basic Concepts
   A. Products Made from Composites
   B. Comparison of Fiber-reinforced Composites to Polymers
   C. Comparison of Fiber-reinforced Composites to Metals
   D. Review Personal Protective Equipment (PPE) and Basic Lab Safety
   E. Introduce and Demonstrate Lab
   F. Practice Lab for Students
   G. MTAG Lab Report

II. Composite Materials
A. Sample Materials Data Safety Sheets – MSDS  
B. Epoxy Initiator Pre-Preg Graphite Fiber  
C. Pre-Preg Graphite Fiber

III. Fabrication Processes

A. RTM (Resin Transfer Molding)  
B. VARTM (Vacuum Assisted Resin Transfer Molding)  
C. Filament Winding  
D. Tape Fiber Placement  
E. Compression  
F. Vacuum Bag Molding  
G. Chopper Gun  
H. Infusion  
I. Autoclave  
J. Pultrusion and Extrusion

COURSE CODING

Funding Source: 1..................State  
Institutional Intent: 21..................Vocational Preparatory

This Course is a requirement for the following program(s):
(No Programs Selected)

☑ My Course Proposal is a requirement for a program not on this list  
Program Title/Description/Notes: Industrial Manufacturing Advanced - STT Certificate

Will this course transfer to a 4-year university? No

Is this course designed for Limited English Proficiency? No

Is this course designed for Academic Disadvantaged? No

Does this course have a Workplace Training component? No

CIP Code: 47.0303 ☐ Request Specific CIP Code  
EPC Code: 768 ☐ Request Specific EPC Code

Credits:

Will this course be offered as Variable Credit? No

List Course Contact Hours  
Lecture (11 Contact Hours : 1 Credit) 22
Lab (22 Contact Hours : 1 Credit) 22
Clinical Work (33 Contact Hours : 1 Credit) 0
Other (55 Contact Hours : 1 Credit) 0
Introduction to Composites (District MCO)

Total Contact Hours: 44
Total Credits: 3

COLLEGE SUPPLEMENTAL

Proposed Quarter of Implementation: NA

Winter 2013

☑️ Request Provisional Exception

Class Capacity: 20

Modes of Delivery: (Check all that apply)

☑️ Fully On Campus
☐ Fully Online
☐ Hybrid
☐ Other

Explanation:

Class Schedule Description:
Course does not appear in the class schedule.

Student Learning Outcomes:

Communication
Read and listen actively to learn and communicate

Read and listen actively to learn, communicate and understand technical information.

Speak and write effectively for personal, academic, and career purposes

Speak and write effectively for personal, academic, and career purposes

Computation
Use arithmetic and other basic mathematical operations as required by program of study

Human Relations
Use social interactive skills to work in groups effectively

Critical Thinking and Problem-Solving
Think critically in evaluating information, solving problems, and making decisions

Technology
Select and use appropriate technological tools for personal, academic, and career tasks

Personal Responsibility
Manage personal health and safety

Information Literacy
Program Outcomes:

At the end of the program the students will:

- Describe and utilize manufacturing techniques, tools and safety practices.  
  (SLO 1, 2, 3, 4, 5, 7)

- Apply the concepts of diversified manufacturing, OSHA standards, Composites, Welding and LEAN concepts to promote quality and safe production and designs.  (SLO 1, 2, 3, 4, 7)

- Employ the appropriate actions regarding workplace culture, safety and industry standards; (SLO 3, 6)

- Evaluate one's own capabilities and limitations, identify individual needs of continued growth is able to seek consultation from superiors. (SLO 3, 6)

- Communicate effectively and appropriately in the workplace. (SLO 1, 3, 4, 6)

Practice within the standards established by the profession, and identify the parameters of accountability.  
(SLO 2, 4, 5, 6, 7)

Course Outcomes/Objectives:

GENERAL COURSE OBJECTIVES:

Upon completion of the course, students will be able to:

1. Demonstrate safe fabrication and work practices
2. Discuss composite materials
3. Discuss and identify materials and processes
4. Complete a report documenting the fabrication process and final result
5. Demonstrate basic fabrication techniques
6. Define fiber-reinforced composites
7. Discuss properties of composites
8. Recognize products made for fiber-reinforced composites
9. Explain the differences between a polymer and composite
10. Explain the key differences between composites properties to metal properties
11. Make a fiber reinforced composite part

Explain the student demand for the course and potential enrollment:

Part of required curriculum for a Professional Technical Program
Explain why this course is being created:
   Required for A short Term Training Program

What challenges, if any, do you foresee in offering this course:
   None
This is to certify that the above criteria have all been met and all statements are accurate to the best of my knowledge.

Faculty involved in originating this program:

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karen L Whitney</td>
<td></td>
<td>11/5/2012</td>
</tr>
<tr>
<td>Holly Moore</td>
<td></td>
<td>11/5/2012</td>
</tr>
</tbody>
</table>

Dean:

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holly Moore</td>
<td></td>
<td>11/7/2012</td>
</tr>
</tbody>
</table>

Results of SSCC Curriculum Coordinating Council Findings

**Participating Faculty Response and Remarks**

- [ ] Recommended for approval
- [ ] Not recommended for approval
- [x] This course did not go through Committee Review

Chairman, Curriculum Coordinating Council:

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
</table>

Vice President for Instruction:

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
</table>

Page 6 of 6