



**TDR173 - Advanced Design for 3D printing**

Document Type: District Master Course Outline

Proposal Type: New Course

Requester(s): Samuel Hightower

College: North

Origination Approved: 02/15/2018 - 4:17 PM

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**BASIC INFORMATION**

**Requester(s):** Samuel Hightower

**College:** North Seattle College

**Division/Dept:** Workforce Instruction

**Dean:** Aaron James Korngiebel

**Peer Reviewer(s):** Thomas Veith

**COURSE INFORMATION**

**Proposed Course Number:**

Prefix: **TDR**                      Number: **173**

Request a new Prefix

This will be a common course

**Full Title:**                              Advanced Design for 3D printing

**Abbreviated Title:**                      Advcd. Des. 3D Printing

**Catalog Course Description:**

Continued application of 3D printing in the creation of prototypes to show ideas and concepts in a tangible way. Attention on advanced post-processing techniques for 3D prints and building sophisticated print jobs in Simplify3D. Significant practice troubleshooting and problem solving designs and 3D prints. Prerequisite: TDR 170.

**Course Length:**    11 Weeks                               Request an Exception

**Topical Outline:**

- I.            Alternate 3D modeling Software
  - a.    Meshlab
  - b.    Sculptris
  - c.    Structure Synth
  - d.    SCAD
- II.           Advanced Setup and 3D Slicing (Simplify3D)
  - a.    Multiple Processes
  - b.    Multi-Color / Multi-material
  - c.    Manuel/Custom Supports
- III.          Advanced 3D Printing & Post Processing
  - a.    Meshmixer File Prep Techniques

- b. Assembling
  - c. Sanding
  - d. Painting
  - e. Smoothing
  - f. Clear coating
- IV. Project Final
- a. Creation 3D Prototype
  - b. Presentation
  - c. Written Project Report

**COURSE CODING**

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

This Course is a requirement for the following program(s):

**Program Title**

CERT ADV DES MANUF (602F)

My Course Proposal is a requirement for a program not on this list

**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:** 15.1304  Request Specific CIP Code  
**EPC Code:** 798  Request Specific EPC Code

**Credits:**

**Will this course be offered as Variable Credit?** **No**

**List Course Contact Hours**

Lecture (11 Contact Hours : 1 Credit)	55
Lab (22 Contact Hours : 1 Credit)	0
Clinical Work (33 Contact Hours : 1 Credit)	0
Other (55 Contact Hours : 1 Credit)	0
 Total Contact Hours	 55
Total Credits	5

**COLLEGE SUPPLEMENTAL**

**Proposed Quarter of Implementation:** NA

Request Provisional Exception

Spring 2018

**Class Capacity:** 24

**Note:** The following questions are being asked in order to fulfill [Seattle Colleges District VI and AFT Seattle, Local 1789 Agreement](#) language:

Have you discussed the class cap for the course with your unit administrator and with other unit faculty that will be teaching the course?

Yes, discussion has been held.

Is the class cap number that you have indicated mutually agreed upon by unit faculty and unit administrators?

Yes, agreement has been reached.

**Modes of Delivery:** (Check all that apply)

Fully On Campus  Fully Online  Hybrid  Correspondence  Credit by Exam  
 Seminar  Visual Media  Other Explanation:

**Class Schedule Description:**

Continued application of 3D printing in the creation of prototypes to show ideas and concepts in a tangible way. Attention on advanced post-processing techniques for 3D prints and building sophisticated print jobs in Simplify3D. Significant practice troubleshooting and problem solving designs and 3D prints.

Prerequisite to this course is TDR 170 (Introduction to Design for 3D Printing).

**Course Prerequisite(s):**

TDR 170 Intro to Design for 3D Printing

**AA Degree Outcomes:** ( If Applicable )

**Essential Learning Outcomes:**

**Problem Solving**

Problem solving using critical and creative thinking, quantitative and qualitative reasoning, information literacy, and disciplinary and cross-disciplinary knowledge

**Communication**

Communication in oral, written, and artistic modes of expression, individually and in collaboration with others

**Discipline/Program Outcomes:**

- 1) Increased student understanding and proficiency in design
- 2) Demonstrate the ability to identify, formulate and solve engineering problems
- 3) Complete a comprehensive design project using advanced engineering design programs as required by industry standards.
- 4) Describe the role and purpose of codes and standards as they pertain to the life, health, and safety of

the public.

5) Perform the necessary steps to transform an idea or need into a completed project.

6) Perform and support design and estimating functions, including costs, labor requirements, equipment and scheduling functions.

**Course Outcomes:**

<b>Course Outcome</b>	<b>Topical Outline</b>	<b>Program Outcome</b>	<b>ELO</b>
1. Students can successfully demonstrate advanced slicing and file preparation for 3D printing.	II.a,b,c	1,3,5	Problem Solving
2. Student can successfully demonstrate understanding of how to post-process 3D printed prototypes for presentation purposes.	III. a-f	2,5,6	Communication
3. Students can successfully troubleshoot design issues prior to 3D printing a model or print issues during or post a 3D print job.	I. , II. , III.	1,5	Problem Solving
4. Students can successfully convey and idea or concept via a verbal and/or visual presentation.	IV. Project Final (a-c)	2,5	Communication

**Assessment:**

Evaluation may include but is not limited to:

1. In-Class Quizzes and Practical Exams
2. Class Assignments
3. Final Project

Grades are assigned in accordance with standards published in the course syllabus.

**Explain why this course is being created:**

This course has been created to continue application (From TDR 170) and advancement in 3D prototyping concepts and ideas. While the introduction course gives a great foundation to additive manufacturing conventions and standard practices, this course will provide students with a reinforced understanding of digital to physical creation.

**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:

Samuel Hightower  
Print Name

Samuel Hightower  
Signature

1/29/2018  
Date

Dean:

Aaron James Korngiebel  
Print Name

Aaron James Korngiebel  
Signature

1/30/2018  
Date

Executive Workforce Dean

Aaron James Korngiebel  
Print Name

Aaron James Korngiebel  
Signature

1/30/2018  
Date

**Results of NSCC Curriculum and Academic Standards Committee Findings**

**Participating Faculty Response and Remarks**

- Recommended for approval
- Not recommended for approval

Chairman, Curriculum and Academic Standards Committee:

Denise G Brannan  
Print Name

Denise G Brannan  
Signature

2/15/2018  
Date

Vice President for Instruction:

Kristen A Jones  
Print Name

Kristen A Jones  
Signature

2/15/2018  
Date