Northwest Career & Technical Academy

Course Syllabus
Sustainable Engineering 2014-2015
High School Credits Earned:
1.0 Engineering
1.0 Engineering -Based Technical Math
1.0 Computer Science
Dual Credit:
Bellingham Technical College ENGT 122
Washington Engineering Institute CADD 111 / 112

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Course Hours: Mon – Fri 8:00am – 10:30 full school year

Course Description:
The Sustainable Engineering program is a two-semester program for students interested in engineering and sustainable engineering related design. Through experimental (hands on) learning and challenging academic coursework, students will develop skills in basic civil, structural and renewable energy engineering. This course utilizes computer aided design and drafting software along with project management tools to compliment designs. Students will gain hands on experience with 3D printing and prototyping, plasma cam and other printing equipment. Students will develop skills working with renewable energy, and land survey equipment which compliment the coursework.

Instructional topics / units will be covered (but not limited to):
1. Engineering Graphics
2. Architectural Design
3. Drafting with Solids (3D printing)
4. Architectural design using computer aided design and drafting software
5. Metrology
6. Engineering disciplines and career exploration
7. Project and process development
8. Safety (outside and shop labs)
9. Professionalism

Key learning objectives and industry competencies:

Upon completion of this program, students will be able to:
- Understanding and demonstrate basic land surveying theory and equipment operation
- Create and collaborate complex structural cadd drawings to industry standards
- Demonstrate ability to create cad drawing suitable for 3D printing
- Be prepared for entry level engineering work and / or entry to advanced education at the college level
- Understand the complexity of renewable energy systems and approvals
- Understand workplace organization methods such as 5S and Kaizen

Course Resources:
A variety of resources will be used throughout the program including power point presentations, internet based research, cad tutorials, engineering drawings.

Required Materials and Attire:
- Appropriate clothing for outside and construction labs including rain gear, warm coat, long pants and clothes to work with concrete and wood.
- Calculator
- Thumb drive or equivalent (digital portfolio)

Professional Standards:
Attendance is an important component to learning and employability. The Northwest Career and Technical Academy attendance and productivity standards are similar to business and industry. When a student is absent, contact with the main office is expected to explain the reason for the absence within two days.
Industry standards and productivity expectations are:
- Being on time
- Being dependable
- Doing a full days work

High School and College Credit Opportunities:
High school students may earn the following credit equivalencies for the school year**:**
- 1.0 Engineering-based Technical Math
- 1.0 Engineering
- 1.0 Computer Science

High school students may also earn up to 12 college credit through Bellingham Technical College (BTC). Students may also earn up to 16 college credits through Washington Engineering Institute (WEI).
List of articulated courses:
- (WEI) ENGR 101 – Civil / Survey Industry Introduction (3 credits)
- (WEI) CADD 111- AutoCAD 2D Drawings (4 credits)
- (WEI) CADD 112- AutoCAD 3D Drawings (4 credits)
- (WEI) SURV 131- Traditional Surveying Equipment with Lab (5 credits)
- (BTC) ENGT 121 Drafting I (6 credits)
- (Tech Prep) ENGT 121 CAD I: Basics (6 credits)

Grades, Grading Scale and Job Readiness:
Students will receive grades in the following areas:

1. Professionalism / Employability –	20% of overall grade
Attendance	(25 %)
Class participation	(20 %)
Conduct	(20 %)
Safety practices	(10 %)
Appropriate use of classroom equipment	(15 %)
Retention of learned material	(10 %)
2. Skills –	20% of overall grade
Computer Skills	(50 %)
Tool use	(20 %)
Project development (group labs)	(30 %)
3. Knowledge –	60% of overall grade
Class assignments	(25 %)
Writing quality	(10 %)
Graphics presentations	(15 %)
Oral presentations	(15 %)
Tests	(20 %)
Independent research	(15 %)

Grading Scale:

A	93% or better	C	73% - 77.9%
A-	90% - 92%	C-	70% - 72.9%
B+	88% - 89.9%	D+	68% - 69.9 %
B	83% - 87.9%	D	60% - 67.9%
B-	80% - 82.9%	NC	59% or below
C+	78% - 79.9%		

Professional and Industry Behavior Expectations:
Northwest Career and Technical Academy students will be responsible for rules and expectations laid out in the Student/Employee handbook. In addition to these laid out expectations the classroom expectations are expected to be followed.

- Communicate in a professional manner
- No cell phone use while in class including texting
- No personal music device use in while in class
- No food in computer lab
- No beverages in computer lab