Discipline: Engineering Technology / Applied Technology

Date Submitted: July 2015

STATEWIDE CAREER PATHWAYS

ARTICULATION TEMPLATE

General Course Title:
ARCH 101: Introduction to Civil Engineering and Architecture (4 units)
Cerritos College
11110 Alondra Blvd.
Norwalk, CA 90650

Downey High School Course:
Civil Engineering and Architecture (Project Lead the Way)
Downey High School
11040 Brookshire Ave
Downey, CA 90241

General Course Description:
This course introduces the student to the design and construction practices of residential and commercial building projects, design teams and teamwork, communication methods, building codes and ordinances, engineering design calculations, and technical documentation. Students will use industry standard 3D architectural modeling software to facilitate site and building design and technical documentation. Students will use the activity-project-problem-based learning approach to develop their interpersonal skills and creative abilities while applying math, science, and technology knowledge to solve design problems and communicate their solutions.

College Prerequisite(s): None	**HS/ROCP Prerequisite(s):** None

Advisories/Recommendations: Although no specific courses are required as prerequisites, this course is designed for 10th and 11th graders who have taken either Project Lead the Way's Principles of Engineering or Introduction to Engineering Design course and are taking a full sequence of college prep courses.

Course Content:

- Civil Engineering and Architecture Career Awareness
- Historical influence and impact of past Civil Engineering and Architecture accomplishments
- Social responsibility and ethics
- Environmental constraints
- Safety practices and standards in the engineering environment
- Communication, presentation skills and teamwork
- Visualization and sketching techniques
- Engineering drawings and standards
- Maps, topography, easements and zoning
- Development of a local property site
- Project planning (Project Documentation and Presentation)
- Site planning
- Building design
- Structure loading and analysis
- Data collection and analysis

- Civil Engineering and Architecture instruments, tools and measurements.
- Use of 3D design software such as Rivet by Autodesk
- Structural Engineering
- Team Project

Competencies and Skill Requirements (Use additional pages as necessary.) Where appropriate, please incorporate standards being used (e.g. CTE standards).
At the conclusion of this course, the student should be able to:

- Define various careers available and terminology used in the fields of Civil Engineering and Architecture.
- Demonstrate an understanding of social, economical, environmental and ethical impacts of Civil Engineering and Architecture.
- Demonstrate safety practices and standards in the Civil Engineering and Architecture environment.
- Demonstrate ability to effectively communicate verbally, visually and in written format.
- Demonstrate the ability to work as a team member and collaborate in a diverse environment.
- Explain the difference between Civil Engineering and Architectural Engineering.
- Acquire, analyze and interpret data.
- Apply visualization and sketching techniques to solve Civil Engineering and Architecture problems.
- Analyze the strength of basic structures comprising beams, columns and plates.
- Create Civil Engineering and Architectural drawings utilizing industry standards.
- Create and analyze a basic Civil Engineering and Architecture project site.
- Create a rough hand sketch of a structure.
- Design and create structural drawings that demonstrate proper basic use of 3D Civil Engineering and Architecture software (such as Rivet by Autodesk.)
- Create written presentation materials suitable for use by Civil Engineers and Architects.
- Prepare and give an oral presentation to an audience such as panel of experts, classmates, members of advisory committee, parents, teachers, administration or members of the media.
- Demonstrate critical thinking using a variety of established and original problem-solving techniques.
- When given a construction project (problem) demonstrate the ability to identify the problems, plan the solutions, allocate the resources and set up a system to monitor progress.
- Research regulatory agencies to find building laws, codes and environmental constraints.
- Determine the other factors such as cost, climate, function and convenience.

Measurement Methods (include any industry certification or licensure):

- Written tests
- Essay Exam
- Objective Exam
- Portfolio
- Classroom Discussion
- Reports
- Problem Solving Exam
- Skill demonstration
- Written Technical Presentations
- Oral Technical Presentations

***Sample* Textbooks or Other Support Materials (including Software):**

Textbooks:
The entire curriculum for this course, along with all required support materials, is provided by Project Lead the Way™ and no other textbooks are required. The texts listed below may be used as useful references.

- Engineering Your Future: A Project Based Introduction to Engineering

Gomez, Alan & Oakes, William
SBN: 1881018881
Great Lakes Press, INC

- Introduction to Engineering, 3rd Edition (One Class Set Needed)
by Paul H. Wright
ISBN: 0-471-05920X
John Wiley & Sons

- Engineering Drawing and Design, 3rd Edition (One Class Set Needed)
by Madsen Shoemaker
ISBN: 0766816346
Delmar Publishing
Thompson Learning

Software:

- Autodesk AutoCAD
- Autodesk Rivet
- Microsoft Office
- USB Flash Drive

Procedures for Course Articulation:
Cerritos College credit for the articulated course listed above may be received when the following criteria are met:

1. The student has completed the articulated course listed above with a "B" grade or higher in *Introduction to Civil Engineering and Architecture*
2. The student must enroll at Cerritos College within two (2) years from the semester date in which the course was completed.
3. The student will present verification of successful completion of the articulated course by presenting a *Cerritos College Articulation Card* to a Cerritos College Counselor. The *Cerritos College Articulation Card* should be completed and signed by the student's high school counselor or teacher.
4. No more than 12 units of credit may be accepted for credit by examination.

This Agreement will be reviewed annually and will remain in effect until cancelled by either party giving 30 days written notice.

High School/ROP District Signatures		**Cerritos College Signatures**	
		7/24/15	
Faculty/Department Chair	Date	Instructor/Division Chair	Date
	7-21-15	7/21/15	
Principal	Date	Dean of Instruction	Date
		7/22/15	
Superintendent	Date	Vice President	Date
		7/27/15	

Principal	Date	Dean of Instruction	Date
	7-21-15		7/21/15
Superintendent	**Date**	**Vice President**	**Date**
			7/22/15
[*Office use only.*] **TOPs Code:**		[*Office use only.*] **Internal Tracking Number:**	
Date Accepted by Steering Committee:			