Construction Management Technology

Overview

This CRC program offers training of management-level employees for the construction industry, as well as preparation for transfer to a four-year college or university construction program. Graduates may be employed by contractors, business and government agencies for work in project planning, estimating and project coordinating. A student planning to transfer to a four-year college or university should consult the lower division requirements of the anticipated college program.

Program Maps

Construction Management Technology, A.S. Degree
[Program Map](/crc/main/doc/programs/program-maps/cmt-as-degree-ho.pdf)

Construction Management Technology, Certificate of Achievement
[Program Map](/crc/main/doc/programs/program-maps/cmt-cert-ho.pdf)

[Program Map](/crc/main/doc/programs/program-maps/green-buildings-cert-ho.pdf)

Associate Degree

A.S. in Construction Management Technology

This program offers training of management-level employees for the construction industry, as well as preparation for transfer to a four-year college or university construction program.
Graduates may be employed by contractors, business and government agencies for work in project planning, estimating and project coordinating. A student planning to transfer to a four-year college or university should consult the lower division requirements of the anticipated college program.

**HIGHLIGHTS**
*Current curriculum emphasizes analytical problem solving and management skills
*Field trips to a variety of construction sites to study construction methods and procedures (instructor option)
*Transfer potential to four-year programs in Construction Technology

**Catalog Date:** June 1, 2020

### Degree Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
</tr>
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<tbody>
<tr>
<td>ACCT 101</td>
<td>Fundamentals of College Accounting (3)</td>
<td>3 - 4</td>
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<tr>
<td>or ACCT 301</td>
<td>Financial Accounting (4)</td>
<td></td>
</tr>
<tr>
<td>ADT 310</td>
<td>Architectural Computer-Aided Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>CISC 302</td>
<td>Computer Familiarization</td>
<td>2</td>
</tr>
<tr>
<td>CMT 300</td>
<td>Introduction to Construction Plans and Specifications (3)</td>
<td>3</td>
</tr>
<tr>
<td>or BIT 102</td>
<td>Plan Reading and Non-Structural Plan Review (3)</td>
<td></td>
</tr>
<tr>
<td>CMT 112</td>
<td>Construction Estimating</td>
<td>3</td>
</tr>
<tr>
<td>CMT 120</td>
<td>Legal Aspects of Construction</td>
<td>3</td>
</tr>
<tr>
<td>CMT 134</td>
<td>Construction Scheduling and Critical Path Method</td>
<td>3</td>
</tr>
<tr>
<td>CMT 136</td>
<td>Construction Safety</td>
<td>3</td>
</tr>
<tr>
<td>CMT 310</td>
<td>Materials of Construction</td>
<td>3</td>
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<tr>
<td>CMT 313</td>
<td>Computer Estimating for Construction</td>
<td>3</td>
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<tr>
<td>PHYS 310</td>
<td>Conceptual Physics</td>
<td>3</td>
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<td><strong>Total Units:</strong></td>
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</table>

The Construction Management Technology Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

### Career Information

Plan Checker; Estimator; Superintendent; Project Manager; Contractor; Retail/Wholesale; Office Manager; Developer; Foreman; Laborer. Some career options may require more than two years of college study. Classes beyond the associate degree may be required to fulfill some career options or for preparation for transfer to a university program.

### Certificates of Achievement

#### Construction Management Technology Certificate

This CRC program offers training of management-level employees for the construction industry, as well as preparation for transfer to a four-year college or university construction program. Graduates may be employed by contractors, business and government agencies for work in project planning, estimating and project coordinating. A student planning to transfer to a four-year college or university should consult the lower division requirements of the anticipated college program.

**HIGHLIGHTS:**
*Current curriculum emphasizes analytical problem solving and management skills
*Field trips to a variety of construction sites to study construction methods and procedures (instructor option)
*Transfer potential to 4-year programs in Construction Technology

**NOTE TO TRANSFER STUDENTS:** If you are interested in transferring to a four-year college or university to pursue a bachelor's degree in this major, it is critical that you meet with a CRC counselor to select and plan the courses for your major. Schools vary widely in terms of the required preparation. The courses that CRC requires for an Associate's degree in this major may be different from the requirements needed for the Bachelor's degree.

**Catalog Date:** June 1, 2020

### Certificate Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>ADT 310</td>
<td>Architectural Computer-Aided Drawing I</td>
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<td>CMT 120</td>
<td>Legal Aspects of Construction</td>
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<td>CMT 134</td>
<td>Construction Scheduling and Critical Path Method</td>
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<td>CMT 300</td>
<td>Introduction to Construction Plans and Specifications (3)</td>
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<td>CMT 310</td>
<td>Materials of Construction</td>
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<td>CMT 313</td>
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<td><strong>Total Units:</strong></td>
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Construction Management Technology (CMT) Courses

CMT 112 Construction Estimating
This course covers construction quantity survey and estimating practices for residential, light commercial and green building projects.

Career Information
Plan Checker; Estimator; Superintendent; Project Manager; Contractor; Retail/Wholesale; Office Manager; Developer; Foreman; Laborer Some career options may require more than two years of college study. Classes beyond the associate degree may be required to fulfill some career options or for preparation for transfer to a university program.

Green Buildings Certificate

The purpose of this certificate is to develop job skills and an understanding of green strategies for high performance buildings and livable communities. It is focused at students and professionals in the fields of architecture; construction; building management; construction management; building inspection; design technology; landscape; and planning, who want to acquire a comprehensive knowledge of an integrated, economic life-cycle approach to the design of the built environment. It includes study of green rating systems, material choices and environmental strategies for a livable, sustainable future.

Catalog Date: June 1, 2020

Certificate Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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<tr>
<td>ARCH 342</td>
<td>Introduction to Green Buildings</td>
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<td>CMT 310</td>
<td>Materials of Construction</td>
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<td>ARCH 332</td>
<td>Design Awareness (3)</td>
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<tr>
<td>ARCH 334</td>
<td>Advanced Design in Three Dimensions (3)</td>
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<tr>
<td>ADT 320</td>
<td>Architectural Design Technology - Building Information Modeling (BIM) I (3)</td>
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<tr>
<td>ADT 322</td>
<td>Architectural Design Technology - Building Information Modeling (BIM) II (3)</td>
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<tr>
<td>BIT 150</td>
<td>California Energy Code - Building Energy Efficiency Standards (3)</td>
<td></td>
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<tr>
<td>CONST 143</td>
<td>Photovoltaic Systems (3)</td>
<td></td>
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<tr>
<td>ECON 306</td>
<td>Environmental Economics (3)</td>
<td></td>
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<tr>
<td>GEOG 302</td>
<td>Environmental Studies &amp; Sustainability (3)</td>
<td></td>
</tr>
<tr>
<td>GEOG 305</td>
<td>Global Climate Change (3)</td>
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<tr>
<td>GEOG 306</td>
<td>Weather and Climate (3)</td>
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<td>Total Units:</td>
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<td>18</td>
</tr>
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</table>

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Establish meaningful ethical, social and environmental objectives for buildings and communities based on the values of energy and resource conscious design.
- Compare and contrast societal and economic implications of utilizing renewable and non-renewable energy sources.
- Compare and contrast the effect of contextual issues and evaluate their impact on energy consumption, environment and the beneficial experience of interior and exterior spaces.
- PSLO 2: Identify and articulate issues related to the choice of various building, landscape and environmental systems; ideate responsive solutions; and compare the alternatives in making effective, sustainable decisions.
- Analyze and calculate energy use to make informed, environmentally-sound and economic choices to satisfy human needs for comfort and aesthetics.
- Explain the concepts of resource conservation and waste reduction and make sustainable design choices related to materials and construction.
- Develop a comprehensive understanding of green rating systems and the ability to apply these concepts in decision-making.
- PSLO 3: Demonstrate independent learning, teamwork and continuing education habits that will help to encourage a life long pursuit of knowledge.
- To use a team work process to identify issues, analyze criteria, research and apply learned principles to synthesize solutions to specific design projects.
- To demonstrate habits of visual note making and independent research by developing a sketch and notebook to record learning.

Career Information

This certificate helps to develop the knowledge base related to sustainable green buildings and environments for the careers of architecture, construction, construction management, building inspection, horticulture, landscape architecture and architectural design technology.

Construction Management Technology (CMT) Courses

CMT 112 Construction Estimating

Units: 3
Hours: 54 hours LEC
Prerequisite: None.
Advisory: CMT 310
Catalog Date: June 1, 2020

This course covers construction quantity survey and estimating practices for residential, light commercial and green building projects.
Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Demonstrate independent learning and effective communication skills.
- Function independently by attending or logging in to class regularly.
- Communicate professionally and effectively (orally and/or in writing).
- SLO #2: Development of introductory skills in construction estimating.
- Identify the elements required to prepare an estimate.
- Identify the skill set required by an estimator.
- Understand and demonstrating the use of internet search, subcontractor communication and employee contributions to an estimate.
- SLO #3: Define skills necessary to measure and quantify the elements in a residence or building.
- Understand units of measure for different materials.
- Perform calculations required to convert dimensions from feet and inches into feet expressed as a decimal.
- Demonstrate knowledge of the relationships between the quantities measured and pricing as used in estimating.
- Estimate quantities and materials for a complete bid.
- Identify the logical inclusion of green products within a construction project and be able to perform value engineering.
- SLO #4: Demonstrate entry-level proficiency in generating a construction materials Take-Off list.
- Identify and quantify required materials.
- Construct cost reports for material, labor and production quantities.
- Calculate reliable cost of a construction task or project.

CMT 120 Legal Aspects of Construction

<table>
<thead>
<tr>
<th>Units:</th>
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<tbody>
<tr>
<td>Hours:</td>
<td>54 hours LEC</td>
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<tr>
<td>Prerequisite:</td>
<td>None.</td>
</tr>
<tr>
<td>Catalog Date:</td>
<td>June 1, 2020</td>
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</tbody>
</table>

This course is a summary of the legal implications of licensing, contracts, specifications and their interpretations. Emphasis on the laws of liability, workers compensation, social security, Cal-OSHA, lien laws, and federal laws affecting construction and compliance problems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Demonstrate independent learning and effective communication skills.
- Employ learning by functioning independently in terms of attending or logging in to class regularly.
- Communicate professionally and effectively (orally and/or in writing).
- SLO #2: Identify and recall the foundations of the law as they apply to the many phases of construction.
- Identify appropriate insurances and contracts for different types of parties and projects.
- Comprehend the steps of developing and executing the different contracts of a construction project.
- Identify the steps and options for legal action in all phases of a construction project.
- SLO #3: Apply learned knowledge of legal aspects in project/construction management.
- Employ the use of construction documents to support/clarify a position and/or manage a project.

CMT 134 Construction Scheduling and Critical Path Method

<table>
<thead>
<tr>
<th>Units:</th>
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<tbody>
<tr>
<td>Hours:</td>
<td>36 hours LEC; 54 hours LAB</td>
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<td>Prerequisite:</td>
<td>CMT 112</td>
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<tr>
<td>Advisory:</td>
<td>None.</td>
</tr>
<tr>
<td>Catalog Date:</td>
<td>June 1, 2020</td>
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</tbody>
</table>

This course introduces computer and manual techniques used in planning, scheduling and controlling construction projects. Network analysis and applications using critical path method and current computer programs will be utilized.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Demonstrate independent learning and effective communication skills.
- Employ learning by functioning independently in terms of attending or logging in to class regularly.
- Serve and function effectively in project teams simulating real project coordination requirements.
- Communicate professionally and effectively (orally and/or in writing)
- SLO #2: Utilize and apply manual and computer aided scheduling systems used in the construction industry.
- Develop and explain a work breakdown structure, identifying activities, groups of activities, milestones and critical path.
- SLO #3: Apply the use of a schedule for many different project aspects – procurement, contract administration, calculating manpower needs, construction and closeout.
CMT 136 Construction Safety

Upon completion of this course, the student will be able to:

- SLO #1: Demonstrate independent learning and effective communication skills.
- SLO #2: Express and explain a basic safety attitude with an understanding of safety laws that apply to construction.
- SLO #3: Explain and demonstrate how to perform safety administration.

This course addresses the application of safety principles in construction with emphasis on the Occupation Safety and Health Act of 1970 and California OSHA.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- Employ learning by functioning independently in terms of attending or logging in to class regularly.
- Communicate professionally and effectively (orally and/or in writing).
- Express and explain a basic safety attitude with an understanding of safety laws that apply to construction.
- Describe and explain the importance of proper planning and equipment for remaining safe on a jobsite.
- Design a safety plan.
- Present weekly tailgate/safety meetings.
- Describe the growing opportunities for job placement in the safety field.

CMT 295 Independent Studies in Construction Management Technology

Upon completion of this course, the student will be able to:

- SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).
- SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
- Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- Use information resources to gather discipline-specific information.
- Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
- Explain the importance of the major discipline of study in the broader picture of society.
- Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
- Utilize skills from the "academic tool kit" including time management, study skills, etc., to accomplish the independent study within one semester term.

CMT 299 Experimental Offering in Construction Management Technology

CMT 300 Introduction to Construction Plans and Specifications
This is an introductory course in how to read building plans and specifications. Intended for both the homeowner and the builder, the course gives emphasis to building plan symbols, interpretation of shop and field drawings, and requirements for obtaining building permits.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Demonstrate independent learning and effective communication skills.
- Function independently by attending or logging in to class regularly.
- Communicate professionally and effectively (orally and/or in writing).
- SLO #2: Have a basic understanding of construction contract documents, necessary for progress through advanced construction management courses.
- Identify how different contract documents affect the outcome of the construction drawings.
- Develop a clear understanding of the critical support of specifications in combination with drawings to complete a project.
- SLO #3: Comprehend how to read different kinds of specifications and drawings regardless of architect, discipline or type of construction.
- Identify Legends, Symbols and Schedules within the drawings.
- Demonstrate how to read different drawings including construction drawings, shop drawings, details and sections.

CMT 310 Materials of Construction

This is a general survey of materials and methods of building construction. An overall view of residential, commercial, and heavy construction practices will be studied.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Compare common construction methods which are currently being used in the field.
- Demonstrate knowledge of terminology related to construction processes.
- Evaluate appropriate installation techniques for specified materials.
- SLO #2: Evaluate common construction materials which are currently being used in the field.
- Demonstrate knowledge of terminology related to construction materials.
- Analyze composition of specific materials and products used in construction.
- Collect and analyze information on existing and emerging construction materials.

CMT 313 Computer Estimating for Construction

This course is designed to meet current demands for computerized estimating in the construction industry. This course will integrate computer technology with current construction estimating practices. This technology will provide the student with experience in determining construction quantities and costs quickly, economically and effectively.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Demonstrate independent learning and effective communication skills.
- Employ learning by functioning independently in terms of attending or logging in to class regularly.
- Communicate professionally and effectively (orally and/or in writing).
- SLO #2: Develop, explain and apply the foundations of estimating with historical data and computer based software systems.
- Demonstrate computer capabilities in producing man-hour labor and material pricing totals efficiently.
- Produce a variety of computer generated reports to provide format suitable to specific party the information is addressing.
- SLO #3: Comprehend the importance of historical data and how to accumulate it.
- research and analyze a scan of internet resources for product pricing and current cost impact trends.
• analyze an accumulation of estimating data for quantity comparisons in future jobs is also a primary objective.
• SLO #4: Employ the use of construction documents to support/clarify partial or total cost of a project.
• Comprehend the difference between budgets, estimates and bids.
• Identify and clearly separate and support pricing for both soft and hard construction costs.

CMT 495 Independent Studies in Construction Management Technology

Units: 1 - 3  
Hours: 54 - 162 hours LAB  
Prerequisite: None.  
Transferable: CSU  
Catalog Date: June 1, 2020

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of “Special Studies” for full details of Independent Studies.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

• SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
• Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
• Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
• Use information resources to gather discipline-specific information.
• SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
• Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
• Explain the importance of the major discipline of study in the broader picture of society.
• SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).
• Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
• SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).
• Utilize skills from the “academic tool kit” including time management, study skills, etc., to accomplish the independent study within one semester term.

CMT 498 Work Experience in Construction Management Technology

Units: 1 - 4  
Hours: 60 - 300 hours LAB  
Prerequisite: Students must be in a paid or unpaid internship, volunteer position or job related to career goals in Construction Management Technology.  
Enrollment Limitation: None.  
Transferable: CSU  
General Education: AA/AS Area III(b)  
Catalog Date: June 1, 2020

This course provides students with opportunities to develop marketable skills in preparation for employment in their major field of study or advancement within their career. It is designed for students interested in work experience and/or internships in transfer level degree occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student's progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to participate in a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

• DEMONSTRATE AN UNDERSTANDING AND APPLICATION OF PROFESSIONAL WORKPLACE BEHAVIOR IN A FIELD OF STUDY RELATED ONE'S CAREER.(SLO 1)
• Understand the effects time, stress, and organizational management have on performance.
• Demonstrate an understanding of consistently practicing ethics and confidentiality in a workplace.
• Examine the career/life planning process and relate its relevancy to the student.
• Demonstrate an understanding of basic communication tools and their appropriate use.
• Demonstrate an understanding of workplace etiquette.
• DESCRIBE THE CAREER/LIFE PLANNING PROCESS AND RELATE ITS RELEVANCY TO ONE’S CAREER.(SLO 2)
• Link personal goals to long term achievement.
• Display an understanding of creating a professional first impression.
• Understand how networking is a powerful job search tool.
• Understand necessary elements of a résumé.
• Understand the importance of interview preparation.
• Identify how continual learning increases career success.
• DEMONSTRATE APPLICATION OF INDUSTRY KNOWLEDGE AND THEORETICAL CONCEPTS AS WRITTEN IN LEARNING OBJECTIVES IN PARTNERSHIP WITH THE EMPLOYER WORK SITE SUPERVISOR.(SLO 3)

CMT 499 Experimental Offering in Construction Management Technology

<table>
<thead>
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<th>Units:</th>
<th>0.5 - 4</th>
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<td>Transferable:</td>
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<td>Catalog Date:</td>
<td>June 1, 2020</td>
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Cory Fisk
Construction Management Technology Professor

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Web: Cory Fisk's Profile Page (/about-us/contact-us/faculty-and-staff-directory/cory-fisk)