Academic Program Plan for Assessment of Student Learning Outcomes

Construction Management Program

The University of New Mexico

**A. College, Department and Date**

1. College: *School of Engineering*

2. Department: *Civil Engineering – Construction Management*

3. Date: *30 September 2014*

**B. Academic Program of Study[[1]](#footnote-1)\***

*B.S. Construction Management*

**C. Contact Person(s) for the Assessment Plan**

*Mark Russell, Undergraduate Coordinator, russ1307@unm.edu*

**D. Broad Program Goals & Measurable Student Learning Outcomes**

# 1. Broad Program Learning Goals for this Degree/Certificate Program

* 1. Technical Competence - Apply methods to successfully and safely manage construction projects.
     1. Reading and understanding construction documents.
     2. Using construction documents to develop construction estimates & schedule
     3. Using schedule, estimates and construction documents to safely control projects
  2. Leadership - Demonstrate the ability to lead through motivating others and applying appropriate technical skills to solve construction management problems.
     1. Breath of technical skills to communicate across boundaries
     2. Team working
     3. Develop action plans to work with project constraints
  3. Innovation - Develop skills in critical thinking and innovation, recognizing the need for continuously learning new skills and competencies.
     1. Utilize online or library resources
     2. Critically assess current technical documents
     3. Develop ability to apply technology to solve construction problems
  4. Communication - Employ effective communication skills to deal respectfully and ethically with all people.
     1. Effective at Oral Communications
     2. Effective in Written Communications
     3. Effective at Internet-based Communications

# 2. List of Student Learning Outcomes (SLOs) for this Degree/Certificate Program

1 Communication

1.1 Communication

1.2 Ethics

4 Construction Science

4.1 Design Theory

4.11 Select one or more of the following options: Structural Mechanics; Electricity; Thermodynamics; Soil Mechanics.

4.2 Analysis and Design of Construction Systems

4.21 Civil

4.22 Electrical

4.23 Mechanical

4.24 Structural

4.3 Construction Methods and Materials

4.31 Composition and properties

4.32 Terminology & Units of measure

4.33 Standard designations, sizes, and graduations

4.34 Conformance references and testing techniques

4.35 Products, systems and interface issues

4.36 Equipment applications and utilization

4.37 Comparative cost analysis

4.38 Assembly techniques & equipment selection

4.39 Building Codes and Standards

4.4 Construction Graphics

4.41 Basic sketching and drawing techniques

4.42 Graphic vocabulary

4.43 Detail hierarchies, scale, content

4.44 Notes and specifications, reference conventions

4.45 Computer applications

4.5 Construction Surveying

4.51 Survey, layout, and alignment control

4.52 Site organization and development

5 Construction

5.1 Estimating

5.11 Types of estimates and uses

5.12 Quantity takeoff

5.13 Labor and equipment productivity factors

5.14 Pricing and price data bases

5.15 Job direct and indirect costs

5.16 Bid preparations and bid submission

5.17 Computer applications

5.2 Planning and Scheduling

5.21 Parameters affecting project planning

5.22 Schedule information presentation

5.23 Network diagramming and calculations with CPM

5.24 Resource allocation and management

5.25 Impact of changes

5.26 Computer applications

5.3 Construction Accounting and Finance

5.31 Cost accounting and industry formats

5.32 Fixed and variable costs: insurance, bonding, marketing, general and administrative expenses

5.33 Bidding and procurement practices

5.34 Record and report practices

5.35 Capital equipment, depreciation, and expensing

5.36 Forecasting costs, cash flow requirements

5.37 Payment processes and time value of money

5.4 Construction Law

5.41 Construction contracts, roles & responsibilities of parties

5.42 The regulatory environment and licensing

5.43 Lien laws and the contractor's rights

5.44 National and local labor law

5.45 Administrative procedures to avoid disputes

5.5 Safety

5.51 Safe practices

5.52 Mandatory procedures, training, records, and maintenance

5.53 Compliance, inspection, and penalties

5.6 Project Management

5.61 Concepts, roles, and responsibilities

5.62 Labor relations

5.63 Administrative systems and procedures

5.64 Cost control data and procedures

5.65 Documentation at job site and office

5.66 Quality control philosophies and techniques

5.67 Computer applications

**E. Assessment of Student Learning Plan**

**1. Student Learning Outcomes**

*The following table relates the Student Learning Outcomes listed above to the specific class in which the assessment will be performed. The outcomes will be assessed at the end of each semester in which a course is being taught.*

|  |  |  |
| --- | --- | --- |
| **Course** | **Program Goals** | **Student Learning Outcomes** |
| CE 130 Construction Detailing | 1a, 2a | 4.41, 4.42, 4.43, 4.44 |
| CE 160 Civil Engineering Design | 1a, 2a, 3c | 4.45 |
| CE 171 Construction Materials and Techniques | 1a, 2a | 1.1, 4.32, 4.35, 4.38, 4.39 |
| CE 279 Mechanical Electrical Systems Construction | 2a, 3b | 4.11, 4.22, 4.23 |
| CE 283 Geomatics and Surveying | 1a, 2a | 4.21, 4.51, 4.52 |
| CE 305 Infrastructure Materials Science | 2a, 4a | 4.31, 4.32, 4.33, 4.34 |
| CE 350 Engineering Economics | 3a,3c | 1.2, 5.35, 5.37 |
| CE 370 Construction Methods and Equipment | 1b, 2b, 3a, 3b | 4.36, 4.37, 4.38 |
| CE 371 Structures for Construction | 2a, 3a | 4.11, 4.24 |
| CE 376 Construction Estimating | 1a, 1b | 1.2, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17 |
| CE 377 Construction Scheduling | 1b, 3a | 1.1, 5.21, 5.22, 5.23, 5.24, 5.25, 5.26 |
| CE 409 Engineering Ethics | 2b, 4b | 1.1, 1.2 |
| CE 455 Engineering Project Management | 2b, 3b, 4b | 1.1, 1.2, 5.32, 5.33, 5.61, 5.62, 5.63, 5.64, 5.65, 5.66, 5.67 |
| CE 473 Construction Law | 1a, 4c | 1.2, 5.41, 5.42, 5.43, 5.44, 5.45 |
| CE 474 Principles of Written Construction Documents | 1a, 4c | 1.1, 5.41, 5.42, 5.61, 5.63, 5.65 |
| CE 475 Construction Safety | 1c, 4c | 1.2, 5.51, 5.52, 5.53 |
| CE 477 Project Controls | 1c, 2c, 3c | 1.1, 5.11, 5.12, 5.13, 5.14, 5.15, 5.17, 5.21, 5.23, 5.24, 5.25, 5.26, 5.31, 5.32, 5.33, 5.34, 5.36, 5.61, 5.64, 5.67 |
| CE 478 Design of Temporary Support Structures | 2a, 4a | 4.11, 4.24 |
| CE 495 Construction Internship | 1a, 1b, 2a, 2b, 3b, 4a | 5.51, 5.52, 5.53, 5.61, 5.62, 5.63, 5.64, 5.65, 5.66,5.67 |
| CE 497 Design Construction Integration | 2a, 2b, 2c, 3c, 4a, 4b | 1.1, 1.2, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 5.22, 5.23, 5.26, 5.51, 5.61 |

**2. How will learning outcomes be assessed?**

A. What:

i. *Each instructor is required to complete the applicable* Outcome Assessment Report *for their class at the end of each semester. The* Outcome Assessment Report *identifies the applicable Program Goals and the Student Learning Outcomes applicable for that course. It is up to the instructor to determine what type of student work will be evaluated to determine the level of student understanding of the applicable topic.*

ii. *Since actual student work is being evaluated, all of the assessments are based on direct results.*

*iii. The goal is for 80% of all students to obtain a level of 2 or higher based on a rubric of 1 being unacceptable, 2 being acceptable, and 3 being exemplary.*

B. Who: *All of the students in the applicable courses will be evaluated.*

**3. When will learning outcomes be assessed? When and in what forum will the results of the assessment be discussed?**

*To meet the requirements of ACCE accreditation, all of the Construction Management related courses will be assessed by the applicable instructor at the end of the semester in which the course is being taught. The forms must be submitted prior to the beginning of the following semester. The data will be provided in the department’s* Outcome Assessment Report *form to the Undergraduate Coordinator. All information from the forms will entered into the UNM’s TK20 Assessment program.* *The following chart depicts which courses will be taught in which semester for the next three years:*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Undergraduate Planned Course Offerings – Construction Management** | | | | | | | | | | | | |
|  | **2014** | | | **2015** | | | **2016** | | | **2017** | | |
| Course | Spring | Summer | Fall | Spring | Summer | Fall | Spring | Summer | Fall | Spring | Summer | Fall |
| CE 130 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 160 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 171 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 279 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 283 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 305 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 350 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 370 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 371 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 376 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 377 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 409 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 455 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 473*c* |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 474*c* |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 475*c* |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 477 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 478 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 495 |  |  |  |  |  |  |  |  |  |  |  |  |
| CE 497 |  |  |  |  |  |  |  |  |  |  |  |  |

**4. What is the unit’s process to analyze/interpret assessment data and use results to improve student learning?**

*Briefly describe:*

1. *The assessment process will involve the following individuals:*
   1. *The course instructor will be responsible for collecting the data and performing a self-assessment of the education process*
   2. *The Undergraduate Coordinator will be responsible for collecting the data from all of the instructors and entering the data into the TK20 program. The compiled results from the TK20 program will be provided to the program administrator and the Undergraduate Committee*
   3. *The Undergraduate Committee will be responsible for reviewing the results from the TK20 program and preparing a summary for the Civil Engineering Faculty, the Department Chair, and the Advisory Council.*
   4. *The Civil Engineering Faculty will make recommendations for improvements and changes to the curriculum relative to the results of the TK20 program.*
   5. *The Department Chair will provide oversight on the process and provide feedback to the School of Engineering Dean.*
   6. *The Advisory Council will review the data and provide recommendations relative to the current needs of the industry.*

*2. The process for consideration of the implications of assessment for change:*

*a. The results of the TK20 program and the findings from the instructors will be evaluated based on the goal of 80% of the students meeting or exceeding the expectations. Additionally, the input from the Advisory Councils and the Faculty will be considered to determine if there are new trends or material that should be included with the courses.*

*b. The findings from the TK20 program and the recommendations from the applicable committees will be provided to the course instructors for updating course material and revising syllabi and teaching methods. All potential changes will be proposed to the Undergraduate Committee to ensure that no conflicts occur between classes and that the minimum requirements for ACCE and ABET accreditation are upheld.*

*c. Overall, the process will be evaluated by all applicable stake holders to ensure that the changes are in the interest of improving student learning.*

*3. Recommendations will be communicated at the end of each review to the Undergraduate Committee as either meeting minutes or direct communication and then distributed to the next reviewing authority. The following chart provides a summary of the review process. Upon final acceptance of the recommended changes, the instructors will implement their applicable changes and the Undergraduate Coordinator will initiate the applicable forms to request curriculum or catalog changes.*

**Degree-Program Assessment Cycle**

* Construction Management, October 1: Submit Annual Progress Reports on assessment activities for the preceding academic year (Jun 1—May 31)

*Civil Engineering Department submits annual progress report for Construction Management program to School of Engineering (SOE) CARC.*

* SOE CARC, October 1–November 1: Score Report

*SOE CARC reviews and scores report using provost’s rubric and forward to SOE Dean and Civil Engineering Chair. Reports are then returned to Construction Management program administrator for possible revision.*

* Civil Engineering Department, December 1: Submit Annual Summary Reports

*Civil Engineering Chair submits annual progress reports summary to SOE Dean.*

* SOE Dean, January 9: Sign and Submit Summary Report to Provost

*SOE Dean signs and submits summary report to Provost.*

* *Provost, January 22: Posts Summarized Results to UNM website.*

*Provost posts summarized results to website.*

December 1:

Civil Engineering Department Chair submits

Progress report summary to SOE Dean

October 1 – November 1:

SOE CARC reviews and scores report

October 1:

CM submits annual progress report to SOE CARC

1. [↑](#footnote-ref-1)