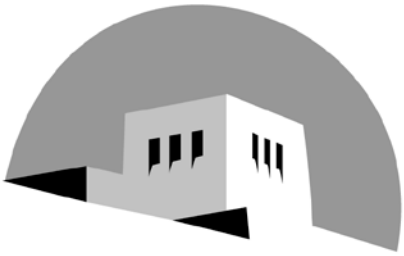
Undergraduate Student Handbook

Department of Civil Engineering



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February 2015

Handbook for Undergraduate Students
Department of Civil Engineering

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IMPORTANT NOTE: Please check our web site for updates to the information contained in this manual: http://civil.unm.edu.

Introduction

Welcome to the Department of Civil Engineering! This handbook provides you with helpful information about the programs in the Civil Engineering department and helps you successfully fulfill the requirements of your chosen undergraduate degree.

The Department of Civil Engineering offers three undergraduate degrees:

BS in Civil Engineering (BSCE)
BS in Construction Engineering (BSConE)
BS in Construction Management (BSCM)

and the graduate degrees of Master of Science in Civil Engineering (MSCE), Master of Construction Management (MCM), Master of Engineering in Civil Engineering (MENG), and Doctor of Philosophy (Ph.D.) in Engineering with a concentration in Civil Engineering.

Mission

The Department of Civil Engineering at the University of New Mexico provides a high-quality learning environment for its undergraduate and graduate students and promotes lifelong learning for practicing professionals. The Department's focus is on quality instruction in engineering and construction management, innovative research, and community engagement.

Program Objectives

The following are the Educational Objectives of the Civil Engineering program:

- Prepare our graduates for successful professional practice or advanced study in civil engineering.
- Provide our graduates with a broad education as a foundation for professional licensure and life-long learning.
- Produce graduates with an appreciation for social, economic and ethical issues related to civil engineering.

The following are the Educational Objectives of the Construction Engineering program:

- Prepare our graduates for successful professional practice or advanced study in construction engineering.
- Provide our graduates with a broad education as a foundation for professional licensure and life-long learning.
- Produce graduates with an appreciation for social, economic and ethical issues related to construction engineering.

Engineering Program Outcomes

Engineering graduates from the department should achieve the skills and have the incentive to become registered professional engineers. The outcomes for the Civil and

Construction Engineering programs are that our students will demonstrate:

a. An ability to apply knowledge of mathematics, science and engineering
b. An ability to design and conduct experiments, as well as to analyze and interpret data
c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. An ability to function on multidisciplinary teams
e. An ability to identity, formulate, and solve engineering problems
f. An understanding of professional and ethical responsibility
g. An ability to communicate effectively
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and society context
i. A recognition of the need for, and an ability to engage in, lifelong learning
j. A knowledge of contemporary issues
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering

Construction Management Outcomes

Graduates of the department's construction management program must appreciate the technical components and understand the managerial aspects of civil engineering construction projects.

The outcomes for this program are:

1. Graduates will achieve competence in construction topics including an understanding of:

a. Elements of calculus, probability and statistics, and general physics
b. Architectural (in contrast to structural) design concepts
c. Scientific management principles applied to construction

2. Graduate will achieve competence in management through:

a. A knowledge of human relations
b. An ability to communicate effectively, both written and oral, as well as an ability to listen
c. An appreciation of ethical principles

3. Graduates will have an educated view of the world including:

a. An understanding of the role and limitations of technology in addressing society’s problems
b. An exposure to the cultural, historical, and philosophical foundations of society
c. A knowledge of the political and economic systems, particularly those that affect the planning, design, construction, and operation of the infrastructure
d. An appreciation for the aesthetics and the environment;

Accreditation

All three undergraduate degree programs in the department are accredited: the BSCE and BSConE by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET), and the BSCM by the American Council for Construction Education (ACCE). A degree from an accredited program is the first step in your professional career and is required for advanced study at most universities.

Accreditation Outcomes

Program Outcomes (ABET) for BS in Civil Engineering and Construction Engineering

a. An ability to apply their knowledge of mathematics, science, and engineering.
b. An ability to design and conduct experiments as well as analyze and interpret data.
c. An ability to design a system, component or process that meets desired needs.
d. An ability to function in multi-disciplinary teams.
e. An ability to identify, formulate and solve engineering problems.
f. An understanding of the professional and ethical responsibility.
g. An ability to communicate effectively.
h. The broad education necessary to understand the impact of engineering solutions in a global/societal context.
i. A recognition of the need for and an ability to engage in lifelong learning
j. A knowledge of contemporary issues.
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Outcomes for the BS in Construction Management

a. Technical Competence
   Apply methods to successfully and safely manage construction projects
b. Leadership
   Demonstrate the ability to lead through motivating others and applying appropriate technical skills to solve construction management problems
c. Innovation
   Develop skills in critical thinking and innovation, recognizing the need for continuously learning new skills and competencies
d. Communication
   Employ effective communication skills to deal respectfully and ethically with all people.

Admission to the Department

Every student who wishes to pursue a degree offered in the CE department must be formally admitted to the department. Students entering the university usually are admitted to the Pre-Engineering/General Engineering program which is part of Engineering Student Services. When they have successfully completed the first year requirements for a degree, they can apply for admission to the CE department.

Admission requirements to the CE department are as follows:

- Completion of at least 26 credit hours toward the degree and good standing in the university.
- An overall GPA of at least 2.2.
- Completion of at least 19-25 credit hours selected from the technical courses required in the first year curricula.
- A GPA of at least 2.75 and grades of C- or better in each of those 19-25 hours.
- Completion of Engl 102.

Transfer students apply through the Office of Admissions and are considered for

admission to the department under the same conditions. The university's Admissions Office and the CE department will evaluate their transcripts to determine which transfer courses will be accepted toward the appropriate degree program. Prior to admission, if necessary, approval may have to be obtained for appropriate course equivalencies or core substitutions from the respective academic departments or the Associate Dean of Engineering.

Students must be admitted to the department before they can register for any 300 or 400 level classes.

Advisement

Once admitted to the department, you will be assigned a faculty advisor who will remain with you until graduation. Construction and engineering programs are very structured by nature, with each course building on previous ones; moreover, most of the courses in the last two years of the curriculum are offered only once a year. Therefore, it is important that you plan your course of studies carefully. Your faculty advisor will not only help you decide which courses to take each semester but also advise you regarding other issues related to success in your studies. As you prepare to register for the upcoming semester, typically in November and April, you must meet with your advisor and fill out an advisement form. You and your advisor will sign the form, after which the department will lift the advisement hold on your registration.

You should make every effort to get to know your advisor and visit with him/her often during the semester. You will find that this relationship will help you make the best decisions regarding your academic future, and an advisor can help you with references, leads for jobs, and many other steps that will help you in your career. While it is critical to follow your advisor's counsel, that will not substitute for taking personal responsibility for your own program.

Academic Policies

The general catalog contains a number of policies affecting your academic program. You should read these policies to ensure that you understand their applications, because they apply to all students in the School of Engineering, regardless of their department.

The faculty encourages you to make the fastest and most efficient progress toward your degree. The following additional departmental policies will help ensure your success in a high-quality program:

- Students in all three degree programs must complete all mathematics, science and engineering courses required for their degree with a grade of C- or better.
- Students must satisfy all prerequisites before enrolling in a course.
- No student may enroll in a course in the civil engineering department without first earning a grade of C- or above in all prerequisites for the course.
- Students transferring into the department must complete at least 24 credit hours of work applicable to the degree after admission to the civil engineering department.
- You will not be permitted to register for a course unless you have satisfied the prerequisites.
- All course work required for graduation in a School of Engineering degree

program must be successfully completed within three attempts. (See http://catalog.unm.edu/catalogs/2013-2014/colleges/engineering/index.html, under Graduation Requirements.)

Placement Out of English 101 and/or 102
Some students may have "placed out" of English 110 (101) and/or (120) 102 by virtue of a minimum ACT or SAT score established by the English Department. "Placement" means that you are not required to take those one or two courses, but you do not receive "credit" for those courses either.

Since our bachelor's degree requires at least 130 credits to graduate, you must take the 3 or 6 credits in other courses in order to satisfy the "credits" that you do not receive for the one or two English courses. This policy has been articulated by the Associate Dean of the School of Engineering, Dr. Charles Fleddermann, confirmed November 2014.

You may take other Humanities, Fine Arts (not a studio course), or Social Sciences. The department must approve your choices.

You must propose to the Coordinator or Program Advisement, in writing (email is fine), what you will substitute for the English 110 (101) and 120 (102), so that your choices can be approved and documented.

Credit/No Credit Grading Option
The Credit/No Credit (CR/NC) grading option cannot be used for any courses required in the curriculum or for any technical elective courses. You may elect the CR/NC option for the Humanities, Social and Behavioral Sciences (except Econ 105/106), Fine Arts, and Second Language electives in the core curriculum. Bear in mind that some schools, when evaluating your record for graduate admissions, may interpret the Credit option as a C, and a No Credit as an F on your transcript, thus affecting your GPA.

Add
A student may add courses or change sections through the second week of the semester.

Drop
You may drop a course or courses without a grade during the first three weeks of the semester. (See http://catalog.unm.edu/catalogs/2013-2014/student-services-information.html, under Changes in Enrollment.)

Withdrawal
After the third week you may withdraw from a course until the end of the 12th week of the semester and are subject to grade of W.

After the 12th week, course withdrawals will only be accepted with approval from the Dean of the School of Engineering. No withdrawals will be accepted after the last day of instruction of the semester, prior to final exam week.

Grades at the time of withdrawal are based upon your scores on homework, quizzes, exams, laboratory assignments, or other course work.

How Withdrawals Can Affect Your Graduation
You must complete a required course with an appropriate grade (C or higher for all core courses; C- or higher for all required engineering courses) within three attempts. The number of "attempts" includes not only those at UNM but also at any other institution with an accredited program where you have taken the course and received a grade. A course "grade" at UNM or elsewhere includes W, WP, WP, WNC, NC, I, AUD, or any grade A through F.

You are NOT eligible for graduation if you cannot earn the required grade within three attempts.

Probation and Suspension
Students who are not making satisfactory progress toward the degree may be placed on probationary status. If the probation conditions are not removed within a semester, a student is subject to dismissal from the School of Engineering. A School of Engineering committee makes recommendations to the SOE Associate Dean on probation and suspension decisions.

University Core Curriculum Requirements
The faculty of the University has instituted a common core of courses required of students in all degree programs. Each curriculum in the CE department satisfies the Writing and Speaking, Mathematics, and Physical and Natural Sciences core requirements. You will be required to select and complete elective courses in Humanities, Social and Behavioral Sciences, Fine Arts and Foreign Languages. You can find the current core curriculum requirements as they apply to students in this department at the end of this handbook.

Degree Curricula
The curriculum for each undergraduate engineering degree is designed to provide a foundation of scientific and mathematical understanding of the principles of engineering as well as an introduction to civil engineering design. Likewise, the construction management curriculum includes basic management and technical courses. The undergraduate engineering curricula at UNM provide a broad background with courses distributed in six of the traditional areas of civil engineering practice: structures and materials, transportation, construction, water resources, environmental and geotechnical engineering. During the senior year, you can select technical elective courses in your field, and many civil engineers further specialize during their graduate studies.

The current course requirements for each degree are included in this handbook. You must satisfy the curriculum specified in the UNM catalog at the time that you are admitted to the department, although you may choose to make substitutions satisfying more recent curriculum requirements that are introduced before you graduate. The Coordinator of Program Advisement will compile a curriculum/degree sheet in your student file showing your progress. Because this form represents the formal record of your standing in the department, you should check it with your faculty advisor each semester to ensure its accuracy.

Electives
The civil engineering curriculum requires a total of 6 electives called Breadth and Depth

Required Electives which allows students to take upper level courses in the sub-disciplines of civil engineering: Construction, Environmental, Geotechnical, Structures, Transportation, and Water Resources. These electives are taken in the junior and senior years and are selected from a list of courses approved by the faculty. The list is included in this handbook (Breadth and Depth Required Electives).

The construction management curriculum includes one elective course, normally taken in the senior year, which is selected from a list of courses approved by the faculty. The list is included in this handbook (Electives for BS in Construction Management).

The construction management curriculum includes a Minor in Management from the Anderson School of Management. The minor requires Mgt 202, Stat 145, and Econ106 as well as Mgt 300 and Mgt 310 and one of the 300-level management electives on the list with a grade of C- or better.

Engineering Breadth and Depth Required Electives
Civil Engineering students must take a total of 4 breadth and 2 depth electives for a total of 6 electives.

Breadth Requirement:
Take one course in four of the six sub-discipline areas listed below.

Depth Requirement:
Take two additional courses in the sub-discipline areas in which you have already taken the breadth electives.

1) You can either take two additional courses in one of the four sub-discipline areas in which you have already taken one elective course.
2) Or, you can take one additional course in one of the sub-discipline areas in which you have already taken an elective course and an additional course in a second sub-discipline area in which you have already taken an elective course.

Sub-Disciplines

Construction	Environmental	Geotechnical
Structures	Transportation	Water Resources

The list of applicable courses is provided at the end of this manual. However, since new courses and Special Topics classes are often being added on a semester basis, it is worthwhile to check with your adviser for recent course offerings..

Senior Capstone Course
The final capstone course, CE 499L: Design of Civil Engineering Systems, is a culmination of all of your studies and can be taken only during your final semester, after you have taken all the basic analysis courses and several of the breadth and depth electives.

Correspondingly, Construction Management students will take the final construction class, CE 497L, which entails the management of a typical construction project, in the last semester of their senior year.

Course Offerings
Most 300 and 400-level departmental courses are taught only once a year. If you are not careful, you may find that a course is not offered during the semester you need it, and you will lose a year in a sequence of courses. Be sure to consult your advisor and plan ahead.

Cooperative Education/Internships
You may find it helpful to your understanding of civil or construction engineering as well as to your choice of an area of specialization to participate in some kind of cooperative education or internship program. These programs allow you to work in an industrial setting and give you experience in the work world to augment your academic education.

UNM's Career Services Office can help provide placement with an employer, either locally or at other locations. Such placements are usually for a semester and adjacent summer. The great advantages of a formal internship or cooperative education assignment are that you get to understand the application of what you have learned, and you acquire experience that is valuable when you look for permanent employment. Employers value such experience, and many students return to their co-op employers after graduation. If a work experience interests you, talk it over with your advisor, because taking a semester away from school will require a careful rescheduling of your courses.

Independent Study
During your senior year, you can choose to pursue independent study under the direction of a departmental faculty member. You may receive credit for that course (CE 491-492, Special Topics in Civil Engineering) as a Breadth or Depth Required Elective, in the category in which the professor is assigned. The CE faculty members, their specialties and contact information are found at the end of this handbook.

Graduation with Honors
Baccalaureate Honors at graduation are automatically awarded subject to the University requirements shown in the UNM Catalog (Undergraduate Program, Baccalaureate Honors).

Departmental Honors are not automatic. You must apply, be accepted by the department, and have a faculty member agree to work with you. You should apply by the end of your junior year so you can take at least six hours of honors independent study (CE 493-494) by the time you graduate. See the Coordinator of Program Advisement for more information and an application.

Application for Degree
During the second semester of your junior year, or prior to enrollment in the 100th hour toward your degree, you must complete an Application for the Undergraduate Degree form, which is available from the Coordinator of Program Advisement. This form indicates the additional courses you plan to take to complete your degree requirements. The Director of Undergraduate Programs will carefully review the completed form to verify that all the departmental and university requirements have been satisfied. When done in a timely fashion, this ensures that your final year of study will result in a BS degree. If you postpone submitting your application until the "final" semester, you may find that you need to take additional courses, thus delaying your graduation.

IMPORTANT: You **must** submit this application by the end of the semester *prior* to the one in which you intend to graduate, or you will not be allowed to take CE 499, Design of Civil Engineering Systems (civil and construction engineering students) or CE 497L, Design Construction Integration (construction management students), which is required in your last semester.

Professional Certification

The Fundamentals of Engineering (FE) is a national examination which all BSCE and BSConE students are required to take before graduating. Passing the FE exam and earning a BS degree are the first steps toward professional licensure, which you enter in the status of Engineering Intern. After a suitable period of practice in the profession and passing of the Professional Engineering exam, you achieve the status of Professional Engineer (P.E.) and are professionally licensed in whatever state(s) you practice. Most civil engineers find it necessary to pursue licensure, both for reasons of professional status and to ensure the health and safety of the public.

There are usually review sessions for the FE exam held each semester, and you will find them helpful as you prepare yourself to take it. Instructions for taking the exam are available at: http://www.ncees.org/Exams/States/NM.php. There is no application deadline. However, a graduating senior must take the exam well before the official date of graduation so that the Coordinator of Program Advisement can certify that he/she has taken the exam.

Likewise, construction managers are certified through an exam administered by the American Institute of Constructors (AIC) (link http://www.professionalconstructor.org/). BSCM graduates are required to take the Associate Constructor (AC) Level I exam in their senior year. Exams are held each spring and fall.

Part-Time Work

If you can avoid working and instead devote full time to your classes, you will finish faster and will enjoy focusing exclusively on your studies. However, if you do find it necessary to work, you should try to select a technical job with a flexible schedule that will allow you to pursue your studies as a first priority. You will need to balance the demands of work and study by reducing your academic load. This causes problems with scheduling and course sequences and invariably leads to a longer program. For this reason, you will want to talk to your advisor about a suitable academic load. The faculty has found it effective to advise students to work no more than 15 hours per week if they plan to take 12 credit hours of academic work.

Student Activities

Many of our graduating students tell us that they wished they had done several things differently during their time at UNM. Their most common advice to incoming students includes: more involvement with student activities, better communication and interaction with the faculty, following an advisor's counsel, and paying more attention in classes. These are excellent recommendations for you as you enter the department.

You will find that participation in extracurricular activities enriches your experience at the university. There are a wide range of organizations and activities both in the larger university and in the department, and participation provides social association, leadership opportunities and professional development. Most students join and become

active in a student chapter of a professional society. This department hosts chapters of the American Society of Civil Engineers (ASCE), the Associated General Contractors (AGC), and the Institute of Transportation Engineers (ITE). These organizations typically sponsor speakers, service projects, national competitions and social events, and your student membership is the start of a lifelong association that is recognized by every employer. Student chapters of American Indian Science and Engineering Society (AISES), Society for Women Engineers (SWE), Women in Science and Engineering (WISE), Engineers Without Borders (EWB-USA), and other organizations are sponsored at the School of Engineering level. The faculty encourages you to be active in organizations.

The department also sponsors a chapter of the national honorary society for civil engineering, Chi Epsilon. Membership in Chi Epsilon, reserved for juniors and seniors who have achieved academic excellence, is recognized by all employers nationwide. Tau Beta Pi is an engineering-wide national honorary society to which civil engineering students may also be invited. If you have excellent grades and six hours of a foreign language, you may be eligible for Phi Beta Kappa, the oldest and most respected honorary society.

Scholarships

There are a wide variety of scholarships available to students through the university, the School of Engineering (Engineering Student Services) and the department. The Civil Engineering department has funding for deserving students in the department, both on the basis of scholarship and need. The annual application deadline is usually around June 1. These will be advertised when they are available via email and on the department's web site.

Graduate Studies

Earning a BS degree is just the first step in your professional career. It provides only the foundation, and you will be continually called upon to learn new things as your career advances. Most engineers find it necessary to take advanced studies as their practices become more specialized. Pursuing the MS or MEng degree allows you the opportunity to learn more about your chosen specialty, and many students find it most efficient to continue directly after completion of the BS. Students with a GPA of 3.0 or over and who are within 10 hours of graduation can take courses for graduate credit, provided that all requirements of the BS degree are also fulfilled.

Core Curriculum Electives for the Civil Engineering Department

The following is the list of Core Curriculum choices for students entering the Civil Engineering Department. All core courses must be completed with a grade of C (not C-) or better. **The bolded course numbers are those already required in our degree programs.**

1. **Writing and speaking**. (9 hours) Three courses chosen from:
   - ✧ English **110** (Composition I) or **112** (Composition I and II) or **113** (Enhanced Composition) and **120** (Composition III), plus an additional course chosen from **219** (Technical and Professional Writing) or 220 (Expository Writing)
   - ✧ Communication and Journalism 130 (Public Speaking)
   - ✧ Philosophy 156 (Reasoning and Critical Thinking)

2. **Mathematics.** (3 hours) One course chosen from the following:
   - ✧ Math **121,** 129, 150, **162, 163, 180**, 181, 215, Stat 145
   - ✧ Civil and Construction Engineering Students must take Math 162 and 163.
   - ✧ Construction Management students must take Math 121 and Math 180

3. **Physical and Natural Sciences**. (7 hours) Two courses chosen from the following courses, including one laboratory:
   - ✧ Civil Engineering Students must take Chemistry **121-123**, Bio **110** or EPS **101**, and Physics **160, 161**
   - ✧ Construction Engineering students must take Chemistry **121-123**, Bio **110** or EPS **101**, and Physics **160, 161**
   - ✧ Construction Management students must take EPS **101**, Chem **121-123L**, and Physics **151**

4. **Social and Behavioral Sciences.** (6 hours) Two courses chosen from the following:
   - ✧ Africana Studies 109 (Introduction to Comparative Global and Ethnic Societies)
   - ✧ American Studies 182 (Introduction to Environment, Science & Technology), 185 (Introduction to Race, Class & Ethnicity)
   - ✧ Anthropology 101 (Introduction to Anthropology), 110 (Language, Culture and the Human Animal), (130 (Cultures of the World)
   - ✧ Chicana and Chicano Studies 109 (Introduction to Comparative Global and Ethnic Societies)
   - ✧ Community Regional Planning 181 (Introduction to Environmental Problems)
   - ✧ Economics **105** (Introductory Macroeconomics) or **106** (Introductory Microeconomics)
   - ✧ Geography 102 (Human Geography)
   - ✧ Linguistics 101 (Introduction to the Study of Language); AOA Anthropology 110
   - ✧ Native American Studies 109 (Introduction to Comparative Global and Ethnic Societies)
   - ✧ Political Science 110 (The Political World), 200 (American Politics), 220 (Comparative Politics), 240 (International Politics)
   - ✧ Psychology 105 (General Psychology)
   - ✧ Sociology 101 (Introduction to Sociology)
   - ✧ Sustainability Studies 109 (Introduction to Comparative Global and Ethnic Societies)
   - ✧ Women Studies 109 (Introduction to Comparative Global and Ethnic Societies)

3. **Humanities**. (6 hours) Two courses chosen from among the following:
   - ✧ Africana Studies 104 (Introduction to Africana Studies)

- ✧ American Studies 186 (Introduction to Southwest Studies)
- ✧ Chicana and Chicano Studies 201 (Introduction to Chicana and Chicano Studies)
- ✧ Classics 107 (Greek Mythology), 204 (Greek Civilization), 205 (Roman Civilization)
- ✧ Comparative Literature and Cultural Studies 222 (Fairy and Folk Tales), 224 (Literary Questions)
- ✧ English 150 (The Study of Literature), 292, 293 (World Literatures)
- ✧ Foreign Languages (M Lang) 101 (Approaches to Languages and Cultures)
- ✧ Geography 140 (World Regional Geography)
- ✧ History 101, 102 (Western Civilization), 161, 162 (History of the United States), 181 (History of Early Latin America), 182 (Modern Latin American History)
- ✧ Honors Legacy Seminars at 100 and 200 levels
- ✧ Philosophy 101 (Introduction to Philosophical Problems), 201 (Greek Philosophy), 202 (Modern Philosophy)
- ✧ Religious Studies 107 (Living World Religions), 263 (Eastern Religions), 264 (Western Religions)

4. **Foreign Language** (non-English language minimum 3 hours). One course chosen from any of the lower division non-English offerings of the Departments of Linguistics (including Sign Language), Spanish and Portuguese, Foreign Languages and Literatures, and foreign languages in other departments and programs.

5. **Fine Arts**. (3 hours) One course chosen from among the following:
   - ✧ Architecture 121(Introduction to Architecture)
   - ✧ Art History 101 (Introduction to Art), 201, 202 (History of Art I, II)
   - ✧ Dance 105 (Dance Appreciation)
   - ✧ Fine Arts 284 (Experiencing the Arts)
   - ✧ Media Arts 210 (Introduction to Film)
   - ✧ Music 139 (Music Appreciation), 142 (Rock Music Appreciation)
   - ✧ Theatre 122 (Theatre Appreciation)

Students may instead elect to take one three-credit studio course offered by the Departments of Art and Art History, Music, Theatre and Dance, and Media Arts to fulfill this requirement.

Many courses in UNM's core curriculum can be satisfied by taking Advanced Placement courses in high school and achieving a specified score on an AP test. See http://catalog.unm.edu/catalogs/2013-2014/admissions.html under College Board Advanced Placement Program.

CLEP (College Level Examination Program) Subject Exams can also be used for credit for specific courses; contact the School of Engineering for details.

Revised 2/15

Breadth and Depth Required Electives

Civil Engineering students must take a total of 6 breadth and depth electives.

Breadth Requirement:
Take one course in four of the six sub-discipline areas listed below.

Depth Requirement:
Take two additional courses in the sub-discipline areas in which you have already taken courses.

1) You can either take two additional courses in one of the four sub-discipline areas in which you have already taken one course.
2) Or, you can take one additional course in one of the sub-discipline areas in which you have already taken a course and an additional course in a second sub-discipline area in which you have already taken a course.

Breadth and Depth Electives by Sub-Discipline

Sub-Discipline	**Number of Credits**	**Semester Offered**	**Design Component**
Construction			
455 Engineering Project Management	3 credits	Fall	
473/573 Construction Law	3 credits	Spring	
474/574 Principles of Written Construction Documents	3 credits	Fall	
475/575 Construction Safety	3 credits	Spring	
477/577 Project Controls	3 credits	Fall	
478/578 Design of Temporary Support Structures	3 credits	Fall	Yes
491/598 Special Topics (BIM)	3 credits	Spring	
Environmental			
431/531 Physical/Chemical Water Treatment Process	3 credits	Spring	
433/533 Engineering Microbiology	3 credits	Spring	
435/535 Water Reuse	3 credits		
436/536 Biological Wastewater Treatment	3 credits	Fall	
437L/537L Aqueous Enviromental Chemstry & Analysis	3 credits	Spring	
438/538 Sustainable Engineering	3 credits	Fall	
Geotech			

462/562 Foundation Engineering I	3 credits	Fall	Yes
463/563 Earth Structures	3 credits	Fall	Yes
466/566 Pavement Design	3 credits	Spring	Yes
Structures			
411/511 Reinforced Concrete Design	3 credits	Spring	Yes
424/524 Structural Design in Metals	3 credits	Fall	Yes
Transportation			
481/581 Urban Transportation Planning	3 credits	Fall	Yes
482/582 Highway and Traffic Engineering	3 credits	Spring	Yes
Water Resources			
440/540 Design of Hydraulic Systems	3 credits	Spring	Yes
441/541 Hydrogeology	3 credits	Fall	
442 Hydraulic Engineering and Hydrology	3 credits	Fall	

Department of Civil Engineering
Electives for BS in Construction Management

Construction Electives

In order to tailor their degree programs to their interests, Construction Management students have the opportunity to take one Construction elective course. This elective should be at the 300 or 400 level and relevant to the student's anticipated professional career. Below is a list of suggested courses. (These may not be offered each semester. If there is a particular course you would like to take, it would be a good idea to monitor the schedule each semester so that you know in which semester the course will be offered.)

Arch 385	Environmental Controls I
CRP 433	Foundations of Physical Planning
CRP 435	Community Economics for Planners
CRP 465	Land Development Economics
CRP 466	Public Sector Project Analysis
CRP 480	Community Growth and Land Use Planning
CRP 485	Practice of Negotiation and Public Dispute Resolution
CE 382	Transportation Engineering
EPS 333	Environmental Geology
LA 335	Site/Environment
LA 480	Landscape Architecture Technology I: Grading & Drainage

Management Electives

In the Construction Management degree program, there are two required management courses and one elective management course. The required courses to meet ACCE accreditation requirements are Mgt 300, Operations Management and Mgt 310, Legal Issues for Managers. In addition, you must choose a third 300 or 400 level management class for which you have the prerequisites. The choices for the third class are: Mgt 306, 308, 322, 324, 326, 328, 329, 330, or 459.

Minor in Management

The requirements for this degree fulfill the requirements for a Minor in Management. The UNM catalog describes the Management Minor: http://catalog.unm.edu/catalogs/2012-2013/colleges/management/undergrad-dept/minors.html. The Management Minor from the Anderson Schools of Management requires 18 hours. Mgt 202, Stat 145, and Econ 106 are required. You must receive grades of C- or better in all courses applied in the minor.

Mgt 202, Stat 145, and Econ 106 are part of the CM program. Because the upper-level Mgt 303 is required in the CM program, the School of Engineering does NOT allow it to count toward the minor.

You should work with your academic advisor to choose appropriate management courses.

Civil Engineering Faculty 2014-15

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