

The following courses may also be used for graduate credit. For descriptions of 600-level courses, please consult the current *Undergraduate Catalog*, where they are listed as 400-level classes.

CS 617	Introduction to Computer Simulation
CS 641	Advanced Internet Programming
CS 641L	Advanced Internet Programming Lab
CS 645	Internet Security
CS 648	Computer Security
CS 651	Multimedia Systems Design
CS 651L	Multimedia Systems Design Lab
CS 656	Automata and Formal Languages
CS 657	Database Management Systems
CS 660	Compiler Construction
CS 663	Computer Architecture
CS 665	Computer Networks I
CS 666	Computer Networks II
CS 669	Introduction to Digital Image Processing
CS 670	Networks and Distributed Systems
CS 671	Program Derivation
CS 672	Software Product Design and Development I
CS 673	Software Product Design II
CS 674	Decision Environments for Software Product Development
CS 677	Analysis of Algorithms
CS 680	Computer Graphics
CS 682	Artificial Intelligence
CS 689	Advanced Computer Science Topics
CS 690	Independent Study

Construction Management

Director

Shields, David (2003), Associate Professor; B.S., M.S., Texas A&M University; Ph.D., University of Texas at Austin, P.E. (Arizona).

Graduate Coordinator

Opfer, Neil (1989), Associate Professor; B.S., B.A. Washington State University; M.B.A. Purdue University; P.D., University of Wisconsin.

The Master of Science in Construction Management (M.S.C.M.) degree provides graduate-level study for those seeking mid- and upper-level management positions in the construction industry or continued study for the doctorate.

Students with degrees in construction management, engineering, science, architecture and business, as well as related disciplines are invited to apply. Applications for admission to the program are evaluated on an individual basis by the program's faculty.

Documents to be mailed to the Construction Management Program:

Address: University of Nevada Las Vegas; Construction Management Program; 4505 S. Maryland Parkway; Box 454005; Las Vegas, NV 89154-4005.

1. One official transcript from each post-secondary institution attended. Only transcripts sent directly from the institution are considered.
2. Two letters of recommendation.
3. One-page statement indicating the reasons why you wish to earn an M.S. degree.
4. GRE test scores taken in the last five years.

Documents submitted to the Graduate College:

Address: University of Nevada Las Vegas; Graduate College; 4505 S. Maryland Parkway; Box 451017; Las Vegas, NV 89154-1017.

1. A complete application form and a non-refundable fee. The most current application fees for U.S. citizens and international applicants are available online at <http://www.graduatecollege.unlv.edu>.
2. One official transcript of each post-secondary institution attended.

International students must also submit to the Graduate College:

1. Official translated copies of transcripts. Only transcripts sent directly from the institution to the UNLV Graduate College will be considered.
2. Official TOEFL or Michigan Test Scores (only if English is not native language) taken in the last two years.
3. High School Leaving Certificate (for international students only)

**The Confidential Financial Certificate must be submitted to the Office of International Students and Scholars

Master of Science in Construction Management

Admission Requirements

Applicants are considered on an individual basis. Candidates can be admitted on a regular or provisional status. Qualified applicants who are not admitted on either status can take graduate courses as a non-degree student. A maximum of 15 credits taken as a UNLV non-degree graduate student may be applied toward the M.S.C.M. degree.

To be considered for admission:

1. Applicants must have an earned baccalaureate degree from a regionally accredited four-year college or university with preferred study in construction, engineering, architecture, business, or closely related area.
2. Overall undergraduate GPA should be at least 2.75 (4.00=A) for the bachelor's degree or at least 3.00 (4.00=A) for the last two years of undergraduate work.
3. Credit (in semester hours) must have been earned in the following subjects or their equivalents:
 - MATH 181 Calculus I (4 credits)
 - PHYS 151 General Physics I (4 credits)
 - ABS 341 Structures for Architects I (3 credits)
 - CEM 250 Construction Materials & Methods (3 credits).
 - A course in construction or engineering graphics (1 credit)

The leveling courses required of a student before entering the M.S.C.M. program will be determined on an individual basis. The student will be notified in writing of any deficiencies prior to admission to the program. Students with deficiencies exceeding two courses may need to satisfactorily complete them before admission to the graduate program.

4. The applicant must obtain a satisfactory score on the Graduate Record Examination (GRE) as determined by the Graduate Program Committee (GPC).
5. Applicants from countries where English is not the native language, or do not receive a degree from an institution where English is the language of instruction, must show competency in English. A minimum score on the Test of English as a Foreign Language (TOFEL), of at least 213 (computerized), or 550 (written), or 80 (Internet-based) or the Michigan Test with a score of 85. An official report of the score must be submitted to the Graduate College.
6. Please refer to the sections under Admission and Registration Information for complete details of Graduate College application deadlines, admission requirements, and application procedures for domestic and international students. Admission is on a competitive basis.
7. Each applicant must submit official transcripts from all previously attended postsecondary institutions to the Graduate College.

8. Each applicant must also submit to the program two letters of recommendation from individuals familiar with their knowledge, skills and abilities, and a one-page Statement of Objectives describing the reasons why they wish to earn a master's degree and indicating the area of concentration within the construction management discipline in which they wish to pursue graduate work.

Degree Requirements - M.S.C.M. Degree Program

Procedures and requirements for the M.S.C.M. degree will be as prescribed by the Graduate College under Academic Policies, with additional provisions as follows:

1. Each student in conjunction with the Program's Graduate Coordinator will select either the Thesis option or Project Option.

a. Thesis Option.

- i. Student's pursuing the thesis option shall have an Advising Committee composed of at least four members of the UNLV Graduate Faculty of which at least two must be tenured or tenure-track members of the Construction Management Program, the third from the Construction Management Program or a related field, and the fourth must be appointed by the Graduate College.
- ii. Requires completion of at least 30 credits, comprised of 18 required 600/700-level credits of CEM and MBA course work (see 2.a and 2.b below), six credits of approved electives, and six credits of thesis research. The final examination will include a defense of the thesis. Completion of a thesis requires the student to make a unique contribution to the existing knowledge in the field of construction management or engineering. The effort must include the development of a contemporary research topic and the methodology for investigating the topic. The student is required to undertake the research effort to investigate the topic. The thesis prepared as part of this option shall include a literature review, description of the research topic, methodology, and results, and present conclusions obtained from the research effort and recommendations for further work.
- iii. The thesis option student's program of study must be approved by the student's advisory committee.

b. Project Option.

Requires completion of at least 36 credits comprised of 18 required 600/700-level credits of CEM and MBA course work (see 2.a and 2.b), 15 credits of approved electives of which nine credits must be 600/700-level credits of CEM (see 2.c), and three credits of CEM 796. Completion of a project requires the student to investigate and solve, or propose solutions to, a problem related to the field of construction management. It is expected that the results of this effort will be beneficial for and applied to other construction-related projects or problems. The project report prepared for this option shall include a description of the issue investigated, how the investigation was performed,

the results obtained, conclusions regarding the investigation, and recommendations for further work.

2. Program course requirements. Both graduate degree options:
 - a. Require the student to successfully complete CEM 651, CEM 653, CEM 700, CEM 750 or CEM 751, CEM 685 or CEM 740 or CEM 775, and MBA 702. Other courses may be substituted upon written permission of the student's graduate faculty advisor. Students who have credit in CEM 451 and CEM 453 or equivalent courses will select two other courses from the approved elective list.
 - b. Require the student to successfully complete MBA 702 and CEM 700 in the first two semesters of study.
 - c. Require that each student's graduate program show suitable breadth and coherence. As specified in the *Graduate Catalog*. The proposed graduate degree program must be submitted to the Graduate College prior to completion of 16 credit hours of course work toward the degree. The responsibility for meeting this requirement rests with the student. Students will be placed on probation or separated from the program if they neglect this requirement.
 - i. The thesis option program of study will be jointly developed by the student and advisor, approved by the student's committee, and then filed with the Graduate College.
 - ii The project option program of study will be jointly developed by the student and advisor, then filed with the Graduate College.
3. Performance Requirements. Students must make satisfactory progress and comply with all Graduate College and Howard R. Hughes College of Engineering policies. If progress is not satisfactory, probation and separation from the graduate program may result, in accordance with the rules of the Graduate College. Satisfactory progress is defined as filing an proposed graduate degree program before the completion of 16 credit hours of course work, completion of at least six credits of the approved program per calendar year, maintenance of a GPA of 3.00 (4.00), no grades below C and compliance with the letter and spirit of the Graduate Catalog and published policies of the Howard R. Hughes College of Engineering. Additionally, no more than nine credits below B are allowed in the student's graduate program. If progress is not satisfactory, probation and separation may result, in accordance with the rules of the Graduate College. Any student whose GPA falls below 3.00 will be placed on probation and will have two semesters to raise it to 3.00 or above. Students who are awarded a graduate assistantship must be enrolled in 9 credit hours per semester and must elect the thesis option.

Construction Management

CEM 700 1 credit

Construction Seminar I

Introduction to research process, design, measurement, sampling, analysis, and results, research information resources, and literature review. Corequisite: MBA 702 or STAT 463 or equivalent or consent of instructor.

CEM 701 1 credit

Construction Seminar II

Presentations by students on research studies or projects. Presentations and discussions by local construction industry representatives on current construction engineering and management research and practice topics. Prerequisite: CEM 700.

CEM 740 3 credits

Construction Safety and Performance Improvement

Introduction to construction safety issues, regulations and ways to improve safety on the job site. Accidents and their causes, OSHA regulations, and worker safety programs. Productivity concepts, data collection, and analysis of data and factors affecting construction productivity. Means for improving production and study of productivity improvement programs. Prerequisites: CEE 381 or ABS 341, and graduate standing.

CEM 750 3 credits

Advanced Construction Scheduling

Models of network theory and non-network theory for construction scheduling. Systems theory, resource leveling and resource algorithms, project diagnostics, optimum workforce/equipment movement, and as-built schedule coordination. Cost control and computer applications, and expert systems. Case studies. Prerequisites: CEM 453/653 and graduate standing.

CEM 751 3 credits

Construction Cost Analysis and Estimating

Advanced topics in construction estimating including value engineering, pricing strategies, and computer concepts. Development of estimating data. Computer-aided design and cost integration. Range, factor, and parametric estimating. Production factors. Prerequisite: CEM 451 or CEM 651 or consent of instructor.

CEM 775 3 credits

Construction Operations and Management

Theory and practice of construction operations and management. Roles of the designer, owner, constructor, and construction manager. Systems approach to project, firm, and organization issues for construction management. Decision modeling. Readings, case studies, and analysis of construction problems and solutions. Computer applications, case studies. Prerequisites: EGG 307, CEM 740, CEM 750, CEM 751. May be taken concurrently with CEM 751.

CEM 780 **Construction Engineering** **3 credits**

Advanced topics in construction engineering addressing techniques and sequences employed in the construction of civil engineering facilities. Focus on methods improvement and the analysis and design of temporary structures, formwork, and rigging for construction. Case studies. Prerequisites: EGG 307, CEE 381, CEM 740, CEM 751. May be taken concurrently with CEM 751.

CEM 793 **Advanced Independent Study** **1-3 credits**

Advanced independent study of a selected construction topic. Paper required. May be repeated to a maximum of six credits. Prerequisites: Graduate standing and consent of instructor.

CEM 795 **Advanced Special Topics in Construction Management** **1-4 credits**

Outlet for experimental and other topics of interest in advanced construction management. Paper required. Topics and credits to be announced. May be repeated to a maximum of eight credits. Prerequisites: Graduate standing and consent of instructor.

CEM 796 **Special Project in Construction Engineering and Management** **1-3 credits**

Development and undertaking of a project investigating a topic of interest related to construction engineering or construction management. Preparation of a project report. Prerequisite: Graduate standing. May be repeated for a maximum of three credits.

CEM 797 **Research Thesis in Construction Engineering and Management** **1-3 credits**

Development and undertaking of a research study on a contemporary topic related to construction engineering or construction management. Preparation and presentation of a research thesis. May be repeated for a maximum of six credits. Prerequisite: Graduate standing.

Graduate credit may be obtained for courses designated 600 or above. Full descriptions of these courses may be found in the *Undergraduate Catalog* under the corresponding 400 number. Credit at the 600 level normally requires additional work.

- CEM 632 Temporary Construction Structures
- CEM 651 Construction Estimating I
- CEM 651L Construction Estimating Laboratory
- CEM 653 Construction Scheduling and Resource Optimization
- CEM 654 Heavy Construction Equipment & Methods
- CEM 685 Construction Law and Contracts
- CEM 693 Independent Study
- CEM 695 Special Topics in Construction Management

Electrical and Computer Engineering

Chair

Selvaraj, Henry (1994), Professor; M.S., Ph.D., Warsaw University of Technology.

Graduate Coordinator

Jiang, Yingtao (2001), Associate Professor; B.E., Chongqing University; M.S.E.C.E., Concordia University, Montreal; Ph.D., University of Texas at Dallas.

Graduate Faculty

Baghzouz, Yahia (1987), Professor; B.S., M.S., Ph.D., Louisiana State University.

Das, Biswajit (2003), Professor; B.S.E.E., Indian Institute of Technology, Kharagpur; M.S.E.E., Southern Illinois University, Ph.D., Purdue University.

Latifi, Shahram (1989), Professor; B.S., M.S., Teheran University; M.S., Ph.D., Louisiana State University.

McGaugh, Eugene E. (1989), Associate Professor; B.S., University of Kansas; M.S., University of Missouri; Ph.D., University of Kansas.

Muthukumar, Venkatesan (2001), Associate Professor; B.S.E.E., Anna University India; M.S.E.E., Ph.D., Monash University, Australia.

Regentova, Emma (2001), Associate Professor; M.S.C.E., Ph.D., State Engineering University of Armenia.

Saberinia, Ebrahim (2004), Assistant Professor; B.S.E.E., M.S.E.E., Sharif University of Technology; Ph.D., University of Minnesota.

Schill, Robert A. (1993), Professor; B.S.E.E., Milwaukee School of Engineering; M.S.E.E., Ph.D., University of Wisconsin-Madison.

Singh, Sahjendra N. (1986), Professor; B.S., Patna University; M.E., Indian Institute of Science; Ph.D., The Johns Hopkins University.

Stubberud, Peter (1991), Associate Professor; B.S., M.S., Ph.D., University of California, Los Angeles.

Venkat, Rama (1989), Professor; B.Tech., Indian Institute of Technology; M.S., Ph.D., Purdue University.

Yang, Mei (2004), Assistant Professor; B.E.C.E., M.E.C.E., University of Electronic Science and Technology of China; Ph.D., University of Texas at Dallas.

Professors Emeriti

Brogan, William L. (1990-1998), Emeritus Professor; B.S.M.E., State University of Iowa; M.S., Ph.D., University of California, Los Angeles.

Martinez, Ramon (1971-2004), Emeritus Professor; M.S.E.E., Worcester Polytechnic Institute.

Tryon, John G. (1975-1986) Emeritus Professor; B.Phys., University of Minnesota; Ph.D., Cornell University.