

Moss School of Construction, Infrastructure and Sustainability

Irtishad U. Ahmad, Ph.D., P.E., Professor

Ronald A. Baier, P.E., University Instructor Emeritus

José Faria, Ph.D., PMP, Interim Director

Eugene D. Farmer, A.I.A., NCARB, LEED-AP BD+C,
Professor Emeritus

Vamsi S. Kalasapudi, Ph.D., Visiting Instructor

Xuan Lv, Ph.D., Assistant Professor

José D. Mitrani, P.E., CPC, CGC, Professor Emeritus

Ayman A. Morad, Ph.D., Senior Instructor

Wallied Orabi, Ph.D., Associate Professor and
Undergraduate Program Director

Nipesh Pradhananga, Ph.D., P.E., Assistant Professor
and Graduate Program Director

David Ramsey, Ph.D., Instructor

Natasha Wedderburn, MPA, Professional Academic
Advisor

Lu Zhang, Ph.D., Assistant Professor

Bachelor of Science in Construction Management

Degree Program Hours: 121

The undergraduate program in Construction Management is nationally accredited by the American Council for Construction Education. Its goal is to provide students with the knowledge and skills required for entry level supervisory or managerial positions in the construction industry. Graduates usually find employment as project managers, project schedulers, cost estimators, quality controllers or in managing their own construction firms.

Opportunities for employment or advancement exist in all areas of the construction industry including land development, home building, public building, industrialized building systems, commercial, industrial, marine and highway heavy construction, underwater and space age facilities, material and equipment sales and installations, and construction product research, development and sales.

Honorary and Professional Organizations

Sigma Lambda Chi: Sigma Lambda Chi is the national honor society for students in Construction. The purpose of Sigma Lambda Chi is to recognize students in Construction Management for outstanding scholastic achievement. The organization provides a service to the students by inviting guest lecturers, sponsoring student tutoring and undertaking a variety of service projects.

Student Chapter of the Associated General Contractors of America: The AGC is a national student organization sponsored by the Associated General Contractors. Its purpose is to increase student awareness of the construction industry, promote fellowship and professionalism and to provide service to the School, University and Community. Membership is open to all Construction related majors. Activities include sponsoring guest lecturers, attendance at local, regional and national AGC meetings and conferences, and undertaking a variety of service projects.

Student Chapter of the Associated Builders and Contractors: The ABC is a national student organization sponsored by the Associated Builders and Contractors. Its purpose is to increase student awareness of the construction industry, promote fellowship and professionalism and to provide service to the School, University and Community. Membership is open to all Construction related majors. Activities include sponsoring guest lectures, attendance at local, regional and national ABC meetings and conferences, and undertaking a variety of service projects.

Student Chapter of the National Association of Women in Construction: This national student organization is sponsored by the National Association of Women in Construction. Its purpose is to promote knowledge of the construction industry and fellowship within the student body. Activities include monthly meetings with guest lecturers, field trips and a variety of service projects. The FIU student chapter of NAWIC was the first such chapter established in the United States. Membership is open to all construction related majors.

Program of Study

The four year program leading to a Bachelor of Science in Construction Management is for students who are interested in preparing for professional careers in construction management, operations, and related areas in the construction industry.

The Lower Division courses, i.e. Freshman and Sophomore levels, are selected to provide easy transfer for community college graduates. With proper planning, full time transfer students with an A.A. degree are able to complete the four year degree program in four remaining semesters at the University. Prospective community college transfer students should contact an advisor for program information and Lower Division transfer requirements.

Students already working full or part time, many with trades or construction licenses, are generally able to plan their program around job commitments and responsibilities. Faculty advisors are on hand days and evenings to assist students in course selection and scheduling.

Admission

The Moss School of Construction, Infrastructure and Sustainability encourages applications for admission from qualified students from all cultural, racial, religious or ethnic groups, regardless of gender.

Grade Point Average

Admission into the undergraduate program requires a minimum 2.0 grade point average. Students transferring from another university or community college should review the Florida International University Undergraduate Catalog for university policies, application procedures, and financial aid information. Prior to or upon admission, transfer students should also contact a Construction Management advisor to review transcripts and determine allowable transfer credits.

Transfer Credits

No grade below a 'C' in any required course is acceptable for transfer into the program. Lower Division courses (courses at the 1000 or 2000 level) designated as

equivalent by the statewide course numbering system will be accepted by the School as fulfilling the Upper Division requirements. Credits from these Lower Division courses may be used to offset Upper Division core credit requirements. Other 1000 and 2000 level courses designated as equivalent by a School advisor may be accepted by the School as fulfilling Upper Division requirements. When equivalent Lower Division courses are used to fulfill Upper Division course requirements a student will be required to complete an equal number of 3000 level (or above) credits from approved Departmental electives. Transfer credits above the 60 semester credit hours accepted from the community college system will not reduce the number of credit hours to be completed in the Upper Division, including electives, to earn a degree.

University Core Curriculum Requirements

Students entering the University with less than 36 semester credit hours will be required to meet the requirements of the University Core Curriculum, in addition to the School Lower Division Core. Students should review the General Core Requirements in the undergraduate catalog.

Non Degree-Seeking

Students wishing to enroll in courses during the application process may do so as a non-degree seeking, special student. Students must consult an advisor for approval and complete a non-degree seeking enrollment waiver. Without this waiver and advisor approval, there is no guarantee that the courses taken will subsequently be accepted for graduation. No more than 15 semester credits of work taken as a non-degree seeking can be applied towards graduation. Students taking courses under the special student designation should consult other sections of this catalog for their pertinent regulations concerning the special student status.

General Regulations

Normal Loads

Students taking a minimum of 12 semester credit hours per semester are considered full time students. Students taking under 12 hours are considered part time and should be aware that certain University privileges and benefits may not be applicable to part time students. It is not recommended that students take more than 18 credit hours per term. Special exceptions may be made, at the option of the School, in the case of students with a grade point average of 3.0 or greater. Students that meet this criteria wishing to take over 18 semester credit hours must have the approval of both the Director of the School and the Dean of the College of Engineering and Computing prior to registering.

Grades

The Moss School of Construction, Infrastructure and Sustainability requires a minimum grade of 'C' or better in all required courses and electives. This includes those required courses transferred from other institutions.

Grade of Incomplete

A grade of 'I' (Incomplete) may be granted, at the option of the Instructor, to a student who, due to serious, documented, and verifiable extenuating circumstances

beyond his/her control is unable to complete the work required to obtain a grade for a course. Students wishing to receive an incomplete must meet with their professor and sign an agreement outlining what work must be completed to receive the final grade and when this work is due. Failure of the student to either complete the work required by the agreement or not meet the deadline prescribed in the agreement will result in the grade reverting to a grade of "F" (failing grade).

Independent Study

Students who wish to enroll in an independent study course must have the prior written approval of both the instructor and the School Director. Independent Study courses can not be substituted for required Lower or Upper Division departmental core courses or for elective courses.

Minor in Business

Construction Management students take courses in the College of Business Administration that may be applied towards a minor in Business, Marketing, or Entrepreneurship. Students interested in pursuing one of these options should consult the appropriate section of the catalog for details.

Credit By Examination

The School does not generally offer credit by examination. A student with outstanding, exceptional and documented skills in a particular subject as well as an outstanding academic record may request credit by examination, and it is the option of the School Faculty and the School Director whether to grant the request.

Credit For Non-College Learning

The School does not award credit for non-college learning (life work experience).

Student Work

The School reserves the right to retain any and all student work for the purposes of record, exhibition or instruction.

Normal Academic Progress

The student will have maintained normal academic progress when the student earns a minimum grade point average of 2.0 for all work attempted during a term, and an overall minimum of 2.0.

Course Sequence and Prerequisites

Course prerequisites are clearly indicated in this catalog and on the Undergraduate Program sheets, available in the School office. In the event of a conflict between the program sheet and the catalog, the catalog requirements will prevail. It is the student's responsibility to ascertain that required prerequisites have been taken and passed prior to registering for a course. Failure to comply with prerequisite requirements may result in the student being dropped from a class.

Probation or Dismissal

Students who do not make satisfactory academic progress may be excluded from further registration. Students dismissed from the University for academic reasons will normally not be allowed to re-enroll for one year.

Class Attendance

Class attendance may be required and may be used for grade determination at the option of the instructor.

Graduation

In order to be eligible to graduate, the student must meet all University and School requirements. The program of studies consists of a minimum of 45 Lower Division semester credit hours, including 21 semester credit hours that can be used to satisfy the University Core Curriculum, and 60 Upper Division semester credit hours for a minimum total of 121 semester credit hours. The waiving of any required course shall not reduce the minimum of 121 semester credit hours required for graduation. A student entering as a freshman or with less than 36 transfer credit hours must have successfully completed the University Core Curriculum with minimum acceptable grades as determined by Undergraduate Studies (see catalog for additional information). In addition, all required Lower Division and Upper Division Construction Management courses and electives must be completed with a grade of 'C' or better. In order to graduate, a student must also have a minimum grade point average of 2.0, and have met the foreign language requirement.

Students should contact an advisor at least one semester prior to their projected graduation and request a review of his or her file. At the start of the final semester the student is required to complete an Application for Graduation. (See catalog for additional information on graduation procedures and scheduling.) If for any reason a student fails to graduate in the semester after applying for graduation, they must reapply.

It is the student's responsibility to ascertain that all requirements for graduation have been met.

Foreign Language Requirement

Students must meet the University Foreign Language Requirement. Refer to the appropriate sections in the Catalog's General Information for Admission and Registration and Records.

Undergraduate Curriculum

The following courses comprise the undergraduate curriculum leading to a degree of Bachelor of Science in Construction Management. Except for the Environmental Control courses, those numbered 'I' shall be taken before courses numbered 'II'. Some credits of the Lower Division Core can be used to satisfy University Core requirements.

University Requirements

First time students or transfer students with less than 36 credit hours must meet the University's core requirements as outlined in this catalog.

Common Prerequisite Courses and Equivalencies

<u>FIU Course(s)</u>	<u>Equivalent Course(s)</u>
GLY 1010/GLY 1010L	GLYX010/GLYX010L or GLYX030C
BCN 2210	BCNX210
BCN 2253	BCNX253
BUL 4320	BULX320 or BULX241
MAC 2233	MACX233 or MACX311
PHY 2053, PHY 2048L	PHYX053/X048L or

ECO 2013 or ECO 2023	PHYX005/X005L
ACG 3024	ECOX013 or ECOX023
	ACGX021 or ACGX024
	ACGX001
STA 2023	STAX023
BCN 2280	BCNXX280 or SURX101
SPC 2608	SPCX600 or COMX000 or SPCX608

Courses which form part of the statewide articulation between the State University System and the Florida College System will fulfill the Lower Division Common Prerequisites.

For generic course substitutions/equivalencies for Common Program Prerequisites offered at community colleges, state colleges, or state universities, visit: <http://www.flvc.org>. Search Program Listing in Alphabetic Order.

Departmental Lower Division Courses

GLY 1010	Physical Geology	3
GLY 1010L	Physical Geology Lab	1
BCN 2210	Construction Materials and Methods	3
BCN 2253	Building Informatics	3
BUL 4320	Business Law I	3
MAC 2233	Calculus For Business	3
PHY 2053	Physics without Calculus	4
PHY 2048L	Physics Laboratory	1
ECO 2013	Principles of Macroeconomics	3
	or	
ECO 2023	Principles of Microeconomics	3
ACG 3024	Accounting For Managers	3
STA 2023	Statistics for Business and Economics	3
BCN 2280	Construction Surveying	3
SPC 2608	Public Speaking	3

Additional courses required for the degree:

BCN 1272	Plans Interpretation	3
BCN 2402	Structural Design I	3

Upper Division Courses

BCN 1013	Principles of Construction Management	3
BCN 3730	Construction Safety	3
BCN 3740	Legal Aspects of Construction	3
BCN 3761	Construction Documentation and Communication – GL	3
BCN 3762	Building Codes	3
BCN 4431	Structural Design II	3
BCN 3611	Construction Cost Estimating I	3
BCN 4612	Construction Cost Estimating II	3
BCN 3720	Construction Scheduling I	3
BCN 4724	Construction Scheduling II	3
BCN 3753	Financial Management of Construction Organizations	3
BCN 3727	Construction Sitework and Equipment	3
BCN 4465	Temporary Structures in Construction	3
BCN 4561	Environmental Control in Buildings I	3
BCN 4570	Sustainable Approach to Construction	3
BCN 4794	Quality Control in Construction	3
BCN 4564	Environmental Control in Buildings II	3
BCN 4703	Management of Construction Projects	3
BCN 4910	Senior Project	3
MAN 3022	Introduction to Management	3
XXX XXXX	Elective	3

Elective

One 3 credit construction management or 3000-4000 level business/management elective, selected in consultation

with the Undergraduate Advisor of the School department, is required.

Sample Program of Study

The following is a sample program of study for a student seeking to earn a degree of Bachelor of Science in Construction Management. The reader is reminded that all students entering a university in the State University System with fewer than 60 credit hours are required to earn at least nine credit hours prior to graduation by attending one or more summer terms at a state university.

Bachelor of Science in Construction Management

Degree Program Hours: 121

Undergraduate Program

The following analysis assumes that the student enters the university from high school or with less than 36 credits and no foreign language experience.

First Semester: (16)

ENC 1101	Writing and Rhetoric I	3
SLS 1501	First Year Experience	1
MAC 2233	Calculus For Business	3
ECO 2013	Principles of Macroeconomics	3
	or	
ECO 2023	Principles of Microeconomics	3
SPC 2608	Public Speaking	3
	Social Science (Group One or Two)	3

Second Semester: (10)

ENC 1102	Writing and Rhetoric II	3
GLY 1010	Physical Geology	3
GLY 1010L	Physical Geology Lab	1
	Humanities (Group One or Two)	3

Third Semester: (18)

ACG 3024	Accounting for Managers	3
BCN 1013	Principles of Construction Management	3
BCN 1272	Plans Interpretation	3
BCN 2210	Construction Materials and Methods	3
	Humanities (Group One or Two)	3
BCN 3761	Construction Documentation and Communication – GL	3

Fourth Semester: (17)

PHY 2053	Physics w/o Calculus	4
PHY 2048L	General Physics Lab	1
STA 2023	Statistics for Business and Economics	3
BCN 2253	Building Informatics	3
BCN 2280	Construction Surveying	3
BUL 4320	Business Law	3

Fifth Semester: (15)

BCN 2402	Structural Design I	3
BCN 3762	Building Codes	3
BCN 3730	Construction Safety	3
BCN 3611	Construction Estimating I	3
BCN 4570	Sustainable Approach to Construction	3

Sixth Semester: (18)

BCN 3720	Construction Scheduling I	3
BCN 3727	Construction Sitework and Equipment	3
BCN 3740	Legal Aspects of Construction	3
BCN 3753	Financial Management of Construction Organizations	3

BCN 4612	Construction Estimating II	3
BCN 4431	Structural Design II	3

Seventh Semester: (15)

BCN 4465	Temporary Structures	3
BCN 4703	Management of Construction Projects	3
BCN 4724	Construction Scheduling II	3
BCN 4561	Environmental Control in Buildings I	3
BCN 4794	Quality Control in Construction	3

Eighth Semester: (12)

BCN 4564	Environmental Control in Buildings II	3
BCN 4910	Senior Project	3
MAN 3022	Introduction to Management	3
XXX XXXX	Elective	3

Minor in Construction Management

The School offers an undergraduate minor in Construction Management for students in other disciplines. For admission to the minor, students need to be fully admitted to their major and must have a 2.25 GPA.

Students opting for a minor in Construction Management must complete the following courses:

BCN 1272	Plans Interpretation
BCN 3611	Construction Estimating I
BCN 3720	Construction Scheduling I
BCN 3730	Construction Safety
BCN 3762	Building Codes
BCN 4703	Management of Construction Projects

Note: Required prerequisites must be taken for all courses in the minor.

Course Descriptions

Definition of Prefixes

BCN-Construction.

Courses that meet the University's Global Learning requirement are identified as GL.

BCN 1013 Principles of Construction Management (3).

Covers the construction industry with emphasis on the principles of construction management.

BCN 1251 Building Construction Drawing (3).

The laboratory application of Methods and Materials of Construction I. Students study plans, elevations, sections, and details appropriate to light construction.

BCN 1272 Plans Interpretation (3).

Building construction plans interpretation of working drawings for residential, commercial building, and civil construction.

BCN 1520 Practical Electricity and Electrical Circuits (1-5).

Basic concepts of electricity. D.C. and A.C. sinusoidal sources. Resistance. Ohms Law. Analysis of simple resistive circuits. Kirchhoff's Laws. True R.M.S. Values. Power in resistive circuits. Complex nos. Impedance. Basic instrumentation.

BCN 1522 Electrical Wiring in Residential Construction (1-5).

Introduction to residential wiring. Conductors, insulators. Color code. Safety. Ground. National Electrical Code. South Florida Building Code. Practical applications. Measurement devices.

BCN 2210 Construction Materials and Methods (3). A study of the origins, production and uses of construction materials such as concrete, steel, aluminum, wood, brick, and stone. A combination of structural and non-structural, interior and exterior materials and assemblies will be examined.

BCN 2253 Building Informatics (3). Principles and practices of computer assisted building information modeling employed in the construction industry. Prerequisite: BCN 1272.

BCN 2280 Construction Surveying (3). Principles and practices of surveying as it applies to building construction.

BCN 2402 Structural Design I (3). Applications of the principals of statics and strength of materials to engineering problems of equilibrium, strength and stiffness. Topics include equilibrium of forces, stress, strain, beams and col. Prerequisites: MAC 1147 or MAC 1114, PHY 2053, 2048L.

BCN 3240 Construction Equipment (3). Methods, procedures, and equipment used in residential, commercial, and heavy construction. Equipping the construction plant. Production value analysis. Work effectiveness studies.

BCN 3441C Fundamentals of Concrete Properties and Testing (4). This course examines effects of concrete-making materials on the properties of fresh and hardened concrete. Topics include: cement and aggregates properties and testing; analysis of concrete strength. Prerequisites: BCN 3443 or departmental approval.

BCN 3442C Concrete Construction Methods (3). This course covers forming, shoring, placing and reinforcing operations. Cast-in-place foundations, pavements, slabs, structural frames, and others. Prerequisite: BCN 3441C.

BCN 3443 Introduction to the Concrete Industry (3). Overview of the history, careers, job functions, and professional organizations in the concrete industry. Topics include: overview of the concrete industry, history, components, production and uses.

BCN 3444 Applications of Concrete in Construction (3). A detailed study of the many uses of concrete in the construction of buildings, and other facilities. Unique problems faced by materials suppliers, contractors and design professionals. Prerequisite: BCN 3442C.

BCN 3445 Management of Concrete Products I (3). This course provides student with a basic understanding of managing the ordering and delivery process common to all concrete products including planning, organizing and controlling schedule. Prerequisites: BCN 3444 or departmental approval.

BCN 3446 Management of Concrete Products II (3). This course provides basic understanding of managing the manufacturing process common to all concrete products production facilities including planning, organizing, and controlling production. Prerequisites: BCN 3444 or departmental approval.

BCN 3447 Concrete Problems: Prevention, Diagnosis and Resolution (3). Course involves preventing and diagnosing problems related to concrete production, testing, construction and performance. Identification of causes of concrete problems, and resolution methods. Prerequisites: BCN 3444 or departmental approval.

BCN 3611 Construction Cost Estimating I (3). Principles and practices of estimating providing application and drill in surveying quantities of labor and materials for general construction projects: excavation, concrete and formwork, carpentry, masonry, structural steel, lath and plaster, interior finishes. Prerequisites: BCN 1272 and BCN 2210.

BCN 3640 Economic Planning for Construction (3). Nature of construction costs, funding sources and arrangements, capital requirements, bonding, insurance, risk and contingency evaluation, general office operations, and bidding procedures.

BCN 3720 Construction Scheduling I (3). Critical Path and Precedence Diagram Methods in construction planning and scheduling, including: resource management, cashflow, PERT, time compression and scheduling updating. Prerequisite: STA 2023.

BCN 3727 Construction Sitework and Equipment (3). Exposition and critical analysis of practical and sequential aspects of converting raw land to finished product. Course will define various steps and discuss equipment and techniques of accomplishment. Prerequisites: GLY 1010, GLY 1010L, BCN 2210.

BCN 3730 Construction Safety (3). Introduces occupational safety hazards associated with the construction industry. Emphasis placed on recognition, evaluation, and control of safety hazards particularly as they relate to the Occupational Safety and Health Act.

BCN 3740 Legal Aspects of Construction (3). Legal and business aspects of engineering contracts and specifications in the construction industry. Analysis, study of precedents, and application of contract clauses, including changes, changed conditions, termination, disputes, payments, risk and insurance, inspection, liquidated damages, and technical requirements. Prerequisites: BUL 4320 and BCN 1013.

BCN 3753 Financial Management of Construction Organizations (3). Accounting for construction operations; labor, materials, equipment, and overhead costs. Money management, depreciation, taxes, loans, profit/losses analysis. Prerequisites: ACG 3024 or equivalent.

BCN 3761 Construction Documentation and Communication – GL (3). Writing and transmitting construction documentation for technical and legal requirements for construction projects in a global context. Stresses development of verbal and written communication skills. Prerequisite: MAC 2233 or equivalent.

BCN 3762 Building Codes (3). Study of building codes required by local, county, and state levels and their relation to quality control. Prerequisite: BCN 1013, BCN 2210.

BCN 3949 Industry Internship (1). This course provides an opportunity for students to gain supervised, practical work experience in their particular field of interest within the industry. Prerequisites: Consent of advisor and School Director.

BCN 4431 Structural Design II (3). Intro to the material properties, allowable stresses, codes and standards for the design of reinforced concrete, pre-stressed concrete, reinforced masonry structures and the design of steel structures. Prerequisites: BCN 2210, BCN 2402, PHY 2053, PHY 2048L.

BCN 4462 Structural Design III (3). Introduction to the material properties, allowable stresses, applicable codes and standards for the design of reinforced concrete, prestressed concrete and reinforced masonry structures. Prerequisites: BCN 4431.

BCN 4465 Temporary Structures in Construction (3). Material properties, allowable stresses, applicable codes and standards for timber structures and the theory and practice of the planning, design, erection and maintenance of temporary structures. Prerequisites: BCN 4431.

BCN 4561 Environmental Control in Buildings I (3). A study of the concepts of thermal and plumbing systems in residential and commercial buildings, including code provisions and cost estimates. Prerequisite: BCN 2210.

BCN 4564 Environmental Control in Buildings II (3). Concepts and practices of electrical systems in the construction of residential and commercial buildings, including code provisions and cost estimates. Prerequisites: PHY 2053 and PHY 2048L.

BCN 4570 Sustainable Approach to Construction (3). This course presents a study of the concepts and techniques of sustainable construction. An in depth review of sustainable materials and construction techniques will be covered. Prerequisite: BCN 4561.

BCN 4612 Construction Cost Estimating II (3). Quantity take-offs and pricing, and the application of computing techniques in construction estimating. Prerequisites: BCN 3611 and BCN 3727.

BCN 4703 Management of Construction Projects (3). Management of construction project field operations and procedures as they relate to contract management, planning, control, coordination, quality, safety, documentation, and resource management. Prerequisites: BCN 3720, BCN 3730, BCN 3740, BCN 3611.

BCN 4724 Construction Scheduling II (3). The application of advanced computerized planning, scheduling, and simulation techniques to construction operations, processes, and control. Prerequisites: BCN 3720 and BCN 3611.

BCN 4794 Quality Control in Construction (3). Quality control as governed by the job inspector, contractor superintendent, architect-engineer, building official, and governmental agencies and requirements. Prerequisites: BCN 3762 or equivalent.

BCN 4905 Directed Independent Studies (VAR). Specialized intensive study in an area of special interest to the student. Prerequisites: Permission of the instructor and the School Director.

BCN 4906 Special Topics (3). For a group of students who wish an intensive study of a topic not otherwise offered in the University. Prerequisites: Permission of the instructor and the School Director.

BCN 4910 Senior Project (3). This course requires the senior level construction management student to work on a project designed to integrate the knowledge acquired in multiple topics within the undergraduate curriculum. Prerequisites: All BCN courses except BCN 3753 and BCN 4564.