REQUIREMENTS FOR THE BACHELOR OF SCIENCE IN CONSTRUCTION SCIENCE

COLLEGE OF ARCHITECTURE

THE UNIVERSITY OF OKLAHOMA

For Students Entering the Oklahoma State System for Higher Education **Summer 2015 through Spring 2016**

Credit Hours and Grade Average Requirements

Total Credit Hours. **129**
Minimum Upper-Division Hours Required **48**
Minimum Retention/Graduation Grade Point Averages:
Minimum OU Retention GPA **2.50**
Minimum Combined Retention GPA **2.50**
Minimum GPA on all Required Professional Courses **2.50**

Construction Science

B250

Bachelor of Science in Construction Science

OU encourages students to complete at least 32-33 hours of applicable coursework each year to have the opportunity to graduate in four years.

Year	FIRST SEMESTER	Hours	SECOND SEMESTER	Hours
FRESHMAN	**CNS 1112**, Cultures of Collaborating, Creating & Constructing	2	**ENGL 1213**, Principles of English Composition (Core I), **or**	3
	COMM 1113, Principles of Communication	3	**EXPO 1213**, Expository Writing (Core I)	
	ENGL 1113, Principles of English Composition (Core I)	3	§**MATH 1823**, Calculus I (Core I)	3
	HIST 1483 or 1493, U.S. History (Core IV)	3	**P SC 1113**, American Federal Government (Core III)	3
	PHIL 1213, Introduction to Ethics	3	**GEOL 1114**, Physical Geology (Core II)	4
			CNS 1212, Computers in Construction	2
	TOTAL CREDIT HOURS	**14**	**TOTAL CREDIT HOURS**	**15**
SOPHOMORE	**ACCT 2113**, Fundamental Financial Accounting	3	**ACCT 2123**, Fundamental Managerial Accounting	3
	B C 2813, Business Writing	3	**ECON 1123**, Principles of Economics—Micro (Core III)	3
	ECON 1113, Principles of Economics—Macro (Core III)	3	**PHYS 1311**, General Physics Lab I (Core II)	1
	CNS 2714, Materials & Methods I	4	**PHYS 2414**, General Physics for Life Science Majors (Core II)	4
	ARCH 2243 or 2343, History of Architecture I (Core IV) or II	3	**CNS 2813**, Construction Documents & Quantity Surveying	3
			CNS 2812, Construction Fundamentals Lab	2
			CNS 2822, Materials and Methods II	2
	TOTAL CREDIT HOURS	**16**	**TOTAL CREDIT HOURS**	**18**

A minimum 2.50 OU and combined retention GPA is required for admission to Construction Science program. Admission is limited to the top 40 students with the required GPAs based on all courses listed above. All courses listed above must be completed before applying for admission to the junior year.

JUNIOR	**CNS 3103**, Construction Surveying	3	**CNS 3223**, Structures I	3
	CNS 3123, Statics & Strengths of Materials	3	**CNS 3443**, Mechanical, Electrical & Plumbing Systems II	3
	CNS 3433, Mechanical, Electrical & Plumbing Systems I	3	**CNS 3824**, Project Controls Management	4
	CNS 3512, Cost Estimating	2	**CNS 3821**, Project Controls Lab II	1
	CNS 3612, Project Controls Lab I	2	**ECON 2843**, Elements of Statistics (Core I)	3
	CNS 3812, Project Planning & Scheduling	2	**L S 3323**, Legal Environment of Business	3
	MGT 3013, Principles of Organization & Management	3		
	TOTAL CREDIT HOURS	**18**	**TOTAL CREDIT HOURS**	**17**
	SUMMER		**CNS 3943**, Field Work	3
SENIOR	**CNS 4112**, Understanding Design Services	2	**CNS 4153**, Legal Issues in Construction	3
	CNS 4113, Structures II	3	**CNS 4881**, Construction Safety Management	1
	CNS 4122, Building Information Modeling for Construction	2	**CNS 4993**, Construction Science Capstone (Capstone)	3
	CNS 4523, Pre-Construction Services	3		
	CNS 4613, Soils and Foundations	3	Construction Science Elective (upper-division)	2
	Understanding Artistic Forms Elective (Core IV)	3	**Non-Western Culture Elective** (Core IV)—**Upper-Division**	3
	TOTAL CREDIT HOURS	**16**	**TOTAL CREDIT HOURS**	**12**

§ May substitute MATH 1914 for MATH 1823.

A minimum grade of C is required in all CNS courses.

CNS students are strongly encouraged to obtain a minor in Architecture, Business, or Communication.

University-Wide General Education Requirements (minimum 40 hours)

Courses designated as Core I, II, III, IV, or Capstone are part of the General Education curriculum. Students must complete a minimum of 40 hours of General Education courses, chosen from the approved list, including at least one upper-division Gen. Ed. course outside of the student's major. Courses graded S/U or P/NP will not apply.

Core I	**Symbolic and Oral Communication (9–19 hours, 3–5 courses)** •English Composition–6 hours, 2 courses •Mathematics–3 hours, 1 course •Foreign Language–0–10 hours, 2 courses in the same language, (which can be met by successfully completing two years of the same foreign language in high school) •Other (courses such as communication, logic or public speaking)
Core II	**Natural Science (7 hours, 2 courses)** •Courses must be taken from different disciplines in the biological and/or physical sciences; one of which must include a laboratory.
Core III	**Social Science (6 hours, 2 courses)** •One course must be P SC 1113, "American Federal Government"
Core IV	**Humanities (12 hours, 4 courses)** •Understanding Artistic Forms–3 hours, 1 course •Western Civilization and Culture–6 hours, 2 courses, including HIST 1483 or HIST 1493 •Non-Western Cultures–3 hours, 1 course
Senior Capstone Experience (3 hours, 1 course)	

COURSES IN ACCOUNTING (ACCT)

2113 Fundamental Financial Accounting. Prerequisite: Business Administration 1001 or concurrent enrollment. Basic principles of financial accounting. Emphasis on the preparation and use of the income statement, balance sheet and statement of funds flow for corporations. Coverage includes the analysis and recording of transactions involving cash, inventories, fixed assets, bonds and capital stock as well as closing, adjusting and reversing entries for revenue and expense items. (F, Sp, Su)

2123 Fundamental Managerial Accounting. Prerequisite: 2113. Introduction to managerial accounting. Analysis of cost behavior and the use of this knowledge for both short- and long-term decision. An introduction to budgeting and the accumulation of product costs for planning and performance evaluation. Specific coverage includes cost-volume-profit analysis, capital budgeting, allocations, variances from standard costs and the measurement of divisional performance. (F, Sp, Su)

COURSES IN ARCHITECTURE (ARCH)

2243 History of Architecture I. Prerequisite: majors only or permission of instructor. Corequisite: ARCH 2323, ARCH 2354; for Interior Design majors: completion of A HI 2213 and A HI 2223. A theoretical investigation of the cultural, political, and aesthetic values of diverse Western and non-Western cultures and how these affect the built environment from pre-history through the Renaissance. This course continues the development of critical writing skills and further develops analytic skills that act to inform design decisions related to studio projects. (F) [IV-WC]

2343 History of Architecture II. Prerequisite: ARCH 2323, 2354, 2243; Corequisite: ARCH 2423, 2454. An investigation of the cultural, political, and aesthetic values of diverse Western and non-Western cultures and how these have affected the built environment from the Renaissance through the 19th Century. A continuation of the development of critical writing skills and analytic skills that act to inform design decisions related to studio projects. (Sp)

COURSES IN BUSINESS COMMUNICATION (B C)

2813 Business Writing. Prerequisite: English 1213 or EXPO 1213 or equivalent; COMM 1113 or 2613, and B AD 1001 or concurrent enrollment. Business Writing introduces the strategies, processes, and resources necessary for writers in business and professional contexts. Students practice informative and analytical business genres while gaining expertise in research, writing, and revision. (F, Sp, Su)

COURSES IN CONSTRUCTION SCIENCE (CNS)

1112 Cultures of Collaborating, Creating and Constructing. Prerequisite: Construction Science major. Introduction to the foundations of the various planning, design, and construction disciplines. Focus on the collaborative process for creating and constructing the built environment. Histories of expertise areas such as planning, architecture, landscape architecture, interior design, construction science, engineering, and graphic environmental design will be explored and related to how these have evolved to their contemporary conditions. (F)

1212 Computers in Construction. Introductory course providing students with basic computer application knowledge. Familiarizes students with current applications of spreadsheet, 2D and 3D CAD software for use in the construction industry. (Sp)

2714 Materials and Methods I. Prerequisite: 1212. Focuses on materials and methods used to construct a commercial building through the exterior wall system and roof. Content includes field management basics, the submittal process, product and process sustainability, quality basics, inspections and building permitting, inspecting and basic commissioning. Building processes include mobilization, heavy earth moving and excavating equipment selection and use, concrete, steel, masonry and wood building, frame and exterior wall construction, and roof system types and installation. (F)

2812 Construction Fundamentals Lab. Prerequisite: 1212, 2714; corequisite: 2813. Practical exercises reinforce concepts discussed in CNS 2714 and 2813 to improve students' understanding and ability to interpret construction drawings and specifications, use drawing and modeling techniques and understand actual installation of common materials and systems used in buildings. (Sp)

2813 Construction Documents and Quantity Surveying. Prerequisite: 2714. Develops students' ability to understand and interpret the construction drawings and specifications commonly encountered in building construction. Reinforces visual communication skills through sketching and computer graphics to develop the ability to visualize a set of 2D drawings as a 3D building. Drawings, specifications, and sketching are used to learn basic material takeoff processes. (Sp)

2822 Materials and Methods II. Prerequisite: 2714. Corequisite: 2812 an 2813. Focuses on materials and methods used to construct a building from the roofed frame to flooring installation. Content includes exterior cladding, finishes and waterproofing, exterior glazing systems, electrical, plumbing and mechanical system installation basics and above the ceiling installation, interior walls and finishes, interior doors and hardware, dropping ceilings and flooring. (Sp)

3103 Construction Surveying. Prerequisite: Construction Science major or special permission. The practical application of taping, differential, profile, trigonometric leveling, angle measurement, traversing, and other instrument layout techniques for vertical and horizontal construction project control and layout. (F)

3123 Statics and Strengths of Materials. Prerequisite: Math 1823, Physics 2414, and Physics 1311. Provide an understanding of concepts, knowledge and methods of statics and strengths of materials for constructors and architects. (F)

3223 Structures I. Prerequisite: 3123 or special permission. The study of structural design including simple building frames, simple structural systems for gravity, lateral and seismic loads in steel, wood and masonry; basic structural detailing. (Sp)

3433 Mechanical, Electrical and Plumbing Systems I. Prerequisite: Construction Science major. Introduces basic mechanical, electrical, and plumbing (MEP) terminology, concepts and systems. Building systems are related to the constructed building and the required relationships with the skilled trades for the construction of the MEP systems. (F)

3443 Mechanical, Electrical and Plumbing Systems II. Prerequisite: 3433. Course requires a basic understanding of building mechanical, electrical and plumbing (MEP) systems. Content includes advanced evaluation of different building systems — including site utilities, temperature controls, fire protection, fire alarms, security/signal systems, elevators/transportation/conveyance and acoustics for mechanical and electrical systems. Course includes guest presentations on particular aspects of the topics covered. (Sp)

3512 Cost Estimating. Prerequisite: 2813. Content is designed to familiarize students with the estimating process, including coordinating the quantity survey with the estimate, quantitative elements of both direct and indirect cost, price loading, bid preparation, and the ability to visualize the project. Students will perform cost estimates with estimating software. (F)

3612 Project Controls Lab I. Prerequisite: 1212, 2714 and 2813. Applies the concepts in cost estimating and project planning and scheduling to a construction project. (F)

3812 Project Planning and Scheduling. Prerequisite: 2813. Corequisite: 3512 and 3612. Application of scheduling techniques in an integrated construction planning, scheduling and control system. Students will gain knowledge of scheduling theory scheduling options, legal implications and practical applications of scheduling software. Students will schedule a building project using computer software. (F)

3821 Project Controls Lab II. Prerequisite: 3512, 3612 and 3812; corequisite: 3824. Lab applies the concepts learned in project management and controls to a construction project. (Sp)

3824 Project Controls Management. Prerequisite: 3512 and 3812; Corequisite: 3821. Examines how basic accounting principles and procedures relate to the construction project budget and cost reporting after the contract is awarded. Focus on project cost classification, cost codes, logs and cost reports required to maintain a cost control system. Students prepare required project communication and documentation, and set-up and use of a system to track and manage the project including field productivity, work sequence, cost and variance, earned value and profitability, payment and cash flow, schedule compression, change and closeout. (Sp)

3943 Field Work. Prerequisite: junior standing and permission. Utilize a construction work experience to prepare for construction management functions. Student is responsible for finding the construction-related activity and proposing a work-related project. Written and oral presentation is required. (F, Sp, Su)

4112 Understanding Design Services. Prerequisite: 3824. Course explores the roles and responsibilities of the owner, architect/engineer, design consultants and their interface with the constructor from project conception to completion. (F)

4113 Structures II. Prerequisite: 3223. Extension of the study of building structures through structural design of continuous building frameworks; loads, concrete structural systems, foundations, connections, and structural detailing. (F)

4122 Building Information Modeling for Construction. Prerequisite: 3824. Emphasizes the skills and knowledge required by the constructor to participate in the creation, projection, and execution of a project using BIM. Students combine knowledge of materials, methods, drafting, estimating and scheduling with BIM computer applications. (F)

4153 Legal Issues in Construction. Prerequisite: 4523 and Legal Studies 3323. An examination of current construction law as it pertains to the day-to-day management of the construction contract. Includes legal ramifications of construction bidding, contracts, changes, delays anddispute resolution. Emphasis is on the reduction of dispute through knowledge. (Sp)

4523 Pre-Construction Services. Prerequisite: 3824. Explores the role of the constructor, the services they offer during the design process, and their collaboration with design professionals and owners during the pre-construction phase of a project. (F)

4613 Soils and Foundations. Prerequisite: 3223. Content includes identification and classification of soil properties as they pertain to a construction project, the role of the geotechnical engineer, soils reports, soil preparation, foundation design, soil testing, and the causes of building settlement. Practical exercises are emphasized. (F)

4881 Construction Safety Management. Prerequisite: 4523. Emphasizes the importance of safety in the construction industry through guest speakers, readings and other safety materials. Emphasis will be placed on safety as it relates to entry-level management positions and the professional's responsibility in creating a safe jobsite. (Sp)

4993 Construction Science Capstone. Prerequisite: 4112, 4113, 4122, 4523, 4613. All CNS classes in the CNS curriculum prior to the final semester of the senior year must be successfully completed before enrolling in the CNS capstone class. The capstone course is the culmination of the construction science undergraduate experience. Students apply all aspects of the construction project management process in an integrated manner to a single construction project. Class interaction requires participants to utilize and extend knowledge of all areas of expertise used by construction managers. Teamwork, interdisciplinary collaboration and cooperation is emphasized. (Sp) [V]

COURSES IN ECONOMICS (ECON)

1113 Principles of Economics—Macro. Prerequisite: Satisfactory score on the Math placement test, or, for incoming freshmen direct from high school, satisfactory score on the ACT/SAT. The functioning and current problems of the aggregate economy: determination and analysis of national income, employment, inflation and stabilization; money and banking, monetary and fiscal policy; and aspects of international interdependence. **Laboratory** (F, Sp, Su) [III-SS]

1123 Principles of Economics—Micro. Prerequisite: Satisfactory score on the Math placement test, or, for incoming freshmen direct from high school, satisfactory score on the ACT/SAT. Goals, incentives and allocation of resources resulting from economic behavior with applications and illustrations from current issues: operation of markets for goods, services and factors of production; the behavior of firms and industries in different types of competition and income distribution. **Laboratory** (F, Sp, Su) [III-SS]

2843 Elements of Statistics. Prerequisite: a grade of C or better in Mathematics 1503 or 1743 or 1823. Basic statistical techniques emphasizing business and economic applications. Topics covered include data summary techniques, elementary probability theory, estimation, hypothesis testing, simple regression, time-series and index numbers. **Laboratory** (F, Sp, Su) [I-M]

COURSES IN GEOLOGY (GEOL)

1114 Physical Geology for Science and Engineering Majors. Prerequisite: equivalent knowledge of high school chemistry, algebra and trigonometry. Laboratory included. Plate tectonics, the makeup of continents and mountain building. Heat flow, magnetism, gravity, rock deformation, earthquakes and the earth's interior. Surface processes including weathering, erosion, transport and deposition. Landforms, rivers, groundwater, glaciers, ocean processes, and volcanoes. Minerals and rocks. Application of geology to land-use, groundwater, mineral and fossil fuel exploration. **Laboratory** (F, Sp) [II-LAB]

COURSES IN LEGAL STUDIES (L S)

3323 Legal Environment of Business. Prerequisite: junior standing. The legal environment of business organizations with ethical considerations and the social and political influences affecting such environments. (F, Sp, Su)

COURSES IN MANAGEMENT (MGT)

3013 Principles of Organization and Management. Prerequisite: junior standing. An introductory course presenting the basic concepts and practices of management, both private and public. Historical development of management; basic definitions and philosophy; fundamental managerial functions, including planning, organizing, staffing, directing, and controlling; a survey approach to quantification in organizational life; current trends in management; possible future developments in organization and administration. (F, Sp, Su)