THE FACULTY SENATE

December 9, 1997

Dr. Ray M. Bowen
President
Texas A&M University

Dear President Bowen:

At its regular meeting held December 8, 1997 the Faculty Senate considered and approved the following proposal from the University Curriculum Committee:

Changes in Curriculum: College of Architecture
Department of Construction Science
B.S. in Construction Science

Enclosed is the information considered by the Senate. Please inform me of your decision on this recommendation.

Sincerely yours,

Wayne E. Wylie
Speaker, 1997-98

Enclosure
pc: Dr. Ronald G. Douglas, Executive Vice President & Provost
    Dr. James C. Smith, Head, Department of Construction Science
    Dr. R. Bruce Simpson, Chair, Curriculum Committee
    Ms. Linda F. Lacey, Director of Academic Support Services

APPROVED

DATE

1/7/98

FACULTY SENATE RECEIVED

JAN 09 1998
Report of the University Curriculum Committee
November 14, 1997

The University Curriculum Committee recommends approval of the following:

Change in Curriculum

College of Architecture
Department of Construction Science
B.S. in Construction Science
TO: Walter V. Wendler  
Dean, College of Architecture

THROUGH: Academic Affairs Committee  
College of Architecture

FROM: James C. Smith  
Head, Department of Construction Science

DATE: September 8, 1997

SUBJECT: Construction Science Curriculum Changes

The purpose of this memorandum is to request your approval for certain curriculum changes to the Construction Science program. These changes reduce the total required hours for the degree from 137 to 135. Attached please find:

Attachment A. Summary of proposed changes to the Undergraduate program.
Attachment B. New course forms and syllabi for new or revised Construction Science undergraduate courses.
Attachment C. Revised catalog program and course descriptions for the undergraduate program.
Attachment D. Departmental approval for new required course.

Approved:  

[Signature]  
Committee on Academic Affairs  
Ward Wells, Chair

Approved:  

[Signature]  
Walter Wendler, Dean

9.11.97  
Date

9.11.97  
Date
SUMMARY OF PROPOSED 1998-99 CATALOG CHANGES
FOR THE
CONSTRUCTION SCIENCE UNDERGRADUATE CURRICULUM
IN THE
DEPARTMENT OF CONSTRUCTION SCIENCE
COLLEGE OF ARCHITECTURE

I. COSC Courses with Number Changes. Since substantial changes are being proposed to the curriculum, several course numbers are being changed to fit existing COSC courses into the following numbering system:

<table>
<thead>
<tr>
<th>Course Grouping</th>
<th>COSC Number</th>
</tr>
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<tbody>
<tr>
<td>Structure, Soils, Mech./Elec.</td>
<td>X20-X29</td>
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<tr>
<td>(Design concepts):</td>
<td>X40-X49</td>
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<tr>
<td>Emphasis Courses:</td>
<td>X50-X59</td>
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<tr>
<td>Materials and Methods:</td>
<td>X60-X69</td>
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<tr>
<td>Regulatory/Law:</td>
<td>X70-X79</td>
</tr>
<tr>
<td>Project Controls:</td>
<td>X80-X99</td>
</tr>
</tbody>
</table>

Proposed course numbering changes are:

- From COSC 335 to COSC 325 Environmental Control Systems I
- From COSC 336 to COSC 326 Environmental Control Systems II
- From COSC 429 to COSC 421 Structural Systems II w/steel & masonry emphasis
- From COSC 430 to COSC 422 Structural Systems III w/reinforced concrete & formwork emphasis
- From COSC 453 to COSC 375 Estimating
- From COSC 461 to COSC 441 Residential Construction
- From COSC 470 to COSC 460 Construction Labor and Safety

II. COSC Courses with Content Changed.

- Combine COSC 255 Construction Methods and Documents Laboratory (0-3) Credit 1 into COSC 254 Construction Materials and Methods II and change this course from (3-0) Credit 3 to (3-3) Credit 4.
  Reason: To better integrate construction document reading with study of construction methods.
- Combine COSC 329 Structural Systems I (2-2) Credit 3 and COSC 330 Structural Systems II (2-2) Credit 3 into COSC 321 Structural Systems I (3-2) Credit 4.
  Reason: To reduce hours devoted to structural systems as a result of incorporating latest computer applications.
- Change COSC 353 Construction Operations and course content to COSC 353 Managing Construction Operations which contains a portion of the deleted COSC 454.
- Change content of COSC 475 from Scheduling and Cost Control to Scheduling and Mobilization.
III. COSC Courses to be Deleted from Catalog.

COSC 102 Construction Problems and Analysis. (2-3) Credit 3.
Reason: Core curriculum requirement offers several options.
COSC 255 Construction Methods and Documents Laboratory (0-3) Credit 1.
Reason: Combined into revised COSC 254.
COSC 329 Structural Systems I (2-2) Credit 3.
Reason: Combined into new COSC 321.
COSC 330 Structural Systems II (2-2) Credit 3.
Reason: Combined into new COSC 321.
COSC 454 Contracts and Subcontracts (3-0) Credit 3.
Reason: Covered in COSC 353, 455, and 463.
COSC 476 Mobilizing Building Construction Projects (3-0) Credit 3.
Reason: Combined with new COSC 475.
COSC 479 Being incorporated into new course COSC 463

IV. COSC Courses to be added to the Catalog.

COSC 321 Structural Systems I (3-2) Credit 4.
Reason: Consolidates COSC 329 and COSC 330.
COSC 455 Alternate Construction Delivery Systems (3-0) Credit 3.
Reason: To prepare students for non-traditional construction delivery systems.
COSC 463 Construction Law and Ethics (3-0) Credit 3.
Reason: Combines previous contemporary construction law and ethics issues in a new course offering.
COSC 477 Construction Project Controls (3-0) Credit 3.
Reason: A capstone course to provide exposure to construction related financial documents.
COSC 482 Construction Industry Career Options (1-0) Credit 1.
Reason: To provide an introduction to industry options.
COSC 483 Construction Industry Contemporary Issues (1-0) Credit 1.
Reason: To expose students to special topics of current interest to the construction industry.

The following new courses are career track offerings of which a student must select one. These courses will greatly increase the flexibility of the construction science program.

COSC 442 Commercial Construction (3-0) Credit 3.
Reason: To provide a commercial construction area of emphasis.
COSC 443 Industrial Construction (3-0) Credit 3.
Reason: To provide an industrial construction area of emphasis.
COSC 444 Highway/Heavy Construction (3-0) Credit 3.
Reason: To provide a highway/heavy construction area of emphasis.
COSC 445 Facilities Management (3-0) Credit 3.
Reason: To provide a facilities management area of emphasis.
V. Other Changes.

Change SCOM Elective to a SCOM/Writing Elective (3-0) Credit 3.
Reason: To enhance student communication capabilities.

Add STAT 302 Statistical Methods (3-0) Credit 3.
Reason: To better equip students to grasp modern statistical concepts.

Delete the following courses or electives to make room for the proposed construction emphasis areas.
- Writing Elective Credit 3. (To be combined with SCOM Elective.)
- Finance Elective Credit 3.
- Business/Management Elective Credit 3.
- General Elective Credit 3.
- Technical Elective Credit 3.

Move the following courses as indicated to better reflect desired learning sequence:
- COSC 253 from second semester freshman year to first semester sophomore year.
- Am./TX History from second semester freshman to last semester senior year.
- ECON 202 from first semester sophomore year to second semester sophomore year.
- ENDS 249 from second semester sophomore year to second semester freshman year.
- MGMT 212 from second semester sophomore year to first semester sophomore year.
- COSC 373 from second semester junior year to first semester junior year.
- COSC 375 (was COSC 453) from first semester senior year to second semester junior year.
- Social Science Elective from first to second semester of senior year.
- COSC 475 from second to first semester of senior year.
- Humanities Elective from last semester senior year to first semester junior year.
CATALOG PROGRAM AND COURSE DESCRIPTIONS

CURRICULUM IN CONSTRUCTION SCIENCE

The construction industry is the largest industry in the nation with more than 4.5 million employees who produce more than eight percent of the nation's Gross Domestic Product annually. Managing the construction process requires a broad understanding of the principles of construction science as well as leadership skills in motivating teams and integrating a wide range of tasks to produce a completed project.

The Construction Science Program administered by the Department of Construction Science prepares graduates for a career in Construction or a construction-related industry. Courses taught by the Department include construction materials and methods; fundamental design courses in soils and foundations, mechanical and electrical systems and structures; project control systems; construction law, labor, and contracts; and industry emphasis courses. In addition related courses from other Colleges are included to insure a broad base of knowledge in business, engineering, and construction fundamentals.

The Construction Science program is accredited by the American Council for Construction Education. Strong ties are maintained with the construction industry via the Construction Industry Advisory Council, an organization of construction and construction-related companies and individuals committed to supporting the Construction Science program at Texas A&M University. Student chapters of industry professional associations offer students the opportunity for leadership roles and foster strong industry ties. Student chapters of Associated Builders and Contractors (ABC), Associated General Contractors (AGC), National Association of Home Builders (NAHB), American Institute of Constructors (AIC), National Association of Women in Construction (NAWIC), and Sigma Lambda Chi (the national honorary scholastic construction society) are sponsored by the Department.

In addition to the academic course work, each student is required to accomplish an internship for a minimum of twelve weeks of practical work experience with a contractor, or in a construction-related work activity. Students may also participate in a cooperative education program with industry which allows qualifying students to gain valuable experience and professional insights and the opportunity to earn money while pursuing the academic program. Students who wish to continue their education beyond the baccalaureate level may apply for graduate study in a master of science program in construction management, which is administered by the Construction Science Department.

FRESHMAN YEAR

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<tr>
<th>First Semester</th>
<th>(Th-Pr)</th>
<th>Cr</th>
<th>Second Semester</th>
<th>(Th-Pr)</th>
<th>Cr</th>
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<tr>
<td>COSC 153 Intro to the Const. Ind.</td>
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<td>3</td>
<td>Computer Elective(^2)</td>
<td>(3-0)</td>
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<tr>
<td>ENGL 104 Comp. And Rhetoric</td>
<td>(3-0)</td>
<td>3</td>
<td>CHEM 101 Fund of Chem</td>
<td>(3-3)</td>
<td>4</td>
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<tr>
<td>MATH 141 Bus Math I</td>
<td>(3-0)</td>
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<td>MATH 142 Bus Math II</td>
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<tr>
<td>American History(^1)</td>
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<td>ENDS 249 Hist of Bldg Tech</td>
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<td>ENDS 115 Design Comm Foundations</td>
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<td>KINE/ROTC</td>
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\(^1\)American History includes World History, American History, and US History.
\(^2\)Computer Electives include Programming, Computer Science, and Systems Design.

17

18
**SOPHOMORE YEAR**

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<tr>
<td>COSC 253 Const Mats &amp; Meth I</td>
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<td>COSC 254 Const Mats &amp; Meth II</td>
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<td>MGMT 212 Business Law</td>
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<td>ACCT 209 Survey of Acct Prin</td>
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<td>PHYS 201 College Physics</td>
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<td>CVEN 201 Plane Surveying</td>
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<td>POLS 206 American Natl Govt</td>
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<td>3</td>
<td>POLS 207 State &amp; Local Govt</td>
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<tr>
<td>Speech/Writing Elective¹</td>
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<td>ECON 202 Prin of Economics</td>
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<td>KINE/ROTC</td>
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**JUNIOR YEAR**

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<tr>
<td>COSC 353 Managing Construction Operations</td>
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<td>COSC 321 Structural Systems I</td>
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<td>COSC 326 Env Control Systems II</td>
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<td>GEOL 320 Geology for Civil Engrs</td>
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<td>3</td>
<td>CVEN 365 Intro Geotech Engr</td>
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<td>MGMT 363 The Mgmt Process</td>
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<td>STAT 302 Statistical Methods</td>
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<td>COSC 373 Subdiv &amp; Quant of Work</td>
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<td>COSC 375 Estimating</td>
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<td>Humanities Elective¹</td>
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**SUMMER WORK**

COSC 400 Co-op or internship (Report required) - 12 weeks

**SENIOR YEAR**

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<td>COSC 475 Scheduling &amp; Mobilization</td>
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<td>COSC 477 Const Project Controls</td>
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<tr>
<td>COSC 460 Const Labor &amp; Safety</td>
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<td>Social Science Elective¹</td>
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<td>3</td>
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<tr>
<td>COSC 463 Const Law &amp; Ethics</td>
<td>(3-0)</td>
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<td>COSC Technical Elective¹</td>
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<td>COSC 482 Const. Inds. CareerOpts.</td>
<td>(1-0)</td>
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<td>COSC 483 Const Inds Contemp Issues</td>
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<td>COSC 455 Alt Const Delivey Systems</td>
<td>(3-0)</td>
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<td>History Elective¹</td>
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**NOTES:**

1. Must meet Core Curriculum requirements for history.
2. Must meet Core Curriculum requirements for computer usage.
3. Must meet Core Curriculum requirements for speech and writing skills.
4. Must meet Core Curriculum requirements for humanities.
5. Must meet Core Curriculum requirements for social science.
6. Technical elective will be chosen from one of the following emphasis areas:
   - COSC 441 - Residential Construction
   - COSC 442 - Commercial Construction
   - COSC 443 - Industrial Construction
   - COSC 444 - Highway/Heavy Construction
   - COSC 445 - Facilities Management
DEPARTMENT OF CONSTRUCTION SCIENCE (COSC)


153. Introduction to the Construction Industry. (3-0). Credit 3. I, II Intended for the beginning student of Construction Science, or the interested student from another discipline. Characteristics and functioning of the construction industry and the construction contracting process; types of construction companies; types of projects; forms of contractors; roles of participants in a company, and on a construction project; evolution of a project; definition and examination of contract and bid documents; construction bonds and insurance.

253. Construction Materials and Methods I. (3-0). Credit 3. I, II For the beginning student of building design or construction, or the interested student from another discipline. No prerequisite and no prior knowledge of construction contracting or construction materials is assumed. Materials basic to the construction process, understanding their properties and characteristics, materials quality determination, and proper specification; depiction of materials and specification in construction documents; proper methods of design and construction. Primary focus upon concrete, wood and wood products, and masonry materials. Prerequisite: COSC 153.

254. Construction Materials and Methods II. (3-3). Credit 4. I, II Continuation of materials and methods of construction including the documents lab; emphasis upon plan reading, metals utilized in design and construction; structural steel; foundation materials and methods; controls on the design and construction process; pre-cast and tilt wall; concrete reinforcement; wood dimension lumber framing, and heavy timber framing. Prerequisite: COSC 253.

321. Structural Systems I. (3-2). Credit 4. I, II. Introduction to the physical principles that govern classical statics and strength of materials through the design of timber and steel components of architectural structures with computer applications. Prerequisites: MATH 142, PHYS 201 and COSC upper division classification.

325. Environmental Control Systems I. (3-0). Credit 3. I, II Environmental control parameters with emphasis on the thermal environment; preparation of design and drawings of heating, ventilating, and air conditioning (HVAC) systems for residential and/or small commercial buildings; site planning with an emphasis to develop passive programs for buildings; computer applications for preparation of drawings and schedules. Prerequisite: ENDS 211.

326. Environmental Control Systems II. (3-0). Credit 3. I, II Environmental control parameters with an emphasis on electrical, lighting, and plumbing (water supply and drainage) systems; preparation of design and drawings of electrical, lighting, and plumbing systems for residential and/or small commercial buildings; computer applications for preparation of drawings and schedules; introduction to acoustical and fire protection systems. Prerequisite: COSC 325.

353. Managing Construction Operations. (3-0). Credits 3. I, II Managing construction operations from concepts of project selection, estimating, bidding, scheduling, sub contracting practices, cost tracking, project documentation, construction bonds, insurance, payments, and the elements of close out; special emphasis placed on the development of professional communication skills through student prepared multi-media presentations. Prerequisite: COSC upper division classification.

373. Subdivision and Quantification of Work. (2-3). Credit 3. I, II Construction project planning with emphasis on subdivision and quantification of work; quantity take-off using plans and specifications. Prerequisite: COSC 254.


400. Summer Practice. Twelve weeks required. No Credit. Summer practice to familiarize the construction student with practices of the construction industry. Advisor approval required.


422. Structural Systems III. (3-0). Credit 3. I, II Structural principles applied to the design and construction of architectural reinforced concrete structures, formwork, reinforced masonry and trenched safety and shoring; computer application on selected topics. Prerequisite: COSC 421.

441. Residential Construction. (3-0). Credit 3. I, II Residential construction processes, scheduling, subcontracting, financing, estimating, project control and current trends in site selection, design and energy efficiency. Prerequisite: COSC 460, 463, 475 and 482.

442. Commercial Construction. (3-0). Credit 3. I, II Focus on the project management of commercial construction projects ranging from high rise office buildings to small tilt-wall and pre-engineered buildings; topics include project acquisitions, mobilization, management, and close out. Prerequisites: COSC 460, 463, 475 and 482.

443. Industrial Construction. (3-0). Credit 3. I, II. Introduction to industrial construction with an emphasis on process and power plant construction from a field office management perspective. Prerequisites: COSC 460, 463, 475 and 482.

444. Highway/Heavy Construction (3-0). Credit 3. I, II Focus on the various aspects of highway/heavy construction; topics include earthmoving and paving equipment and utilization principles, pavement design and placement methods, unit price bidding methods, and a project case study. Prerequisites: COSC 460, 463, 475 and 482.

445. Facilities Management (3-0). Credit 3. I, II Focus on the various aspects of facilities management; includes budgeting for operations and management, energy management, change management, design-build changes, in house versus out source maintenance, and contracting options. Prerequisites: COSC 460, 463, 475 and 482.

455. Alternate Construction Delivery Systems. (3-0). Credit 3. I, II Introduce students to non-traditional construction delivery systems; includes design-build, job order contracting, performance based procurement and public private partnerships. Prerequisites: COSC 375 and 353.

460. Construction Labor and Safety. (3-0). Credit 3. I, II Constitutional and legal basis of labor relations in the construction industry; craft and trade unions; dual and merit shop operations; contractor-union agreements; safety on the job site; OSHA and related regulations. Prerequisite: COSC 353.

463. Construction Law and Ethics. (3-0). Credit 3. I, II. Delineation of contracts used in the construction industry; emphasis on understanding the functions and interrelationships of documents; review of law applied to the industry; application of the contract, and law, to case studies; introduction to resources and analytical processes used by construction professionals; ethics in the construction industry. Prerequisite: COSC 353.

475. Scheduling and Mobilization. (2-3). Credit 3. I, II. Project scheduling procedures to include computer applications and resource leveling; project types, office and field planning required to initiate the work; equipment and construction methods selection processes and an examination of contractual mandates specified. Prerequisite: COSC 375.

477. Construction Project Controls. (3-0). Credit 3. II. Introduce students to construction related financial documents; includes schedule of values, labor and operations cost reports, and construction budgets, trace construction dollar flow from time sheet to balance sheet. Prerequisite: COSC 475.

482. Construction Industry Career Options. (1-0). Credit 1. I. Graduating senior seminar for Construction Science majors to provide an introduction to industry options. Prerequisite: COSC senior classification.

483. Construction Industry Contemporary Issues. (1-0). Credit 1. II. Graduating senior seminar for Construction Science majors to expose students to special topics of current interest to the construction industry. Prerequisite: COSC 482.

485. Problems. Credit 1 to 5 each semester. I, II. Special problems in building construction. Prerequisite: Senior classification in building construction.

489. Special Topics in Building Construction. Credit 1 to 4. I, II. Selected topics in an identified field of building construction. May be repeated for credit.
TO:                   Dr. H. Joseph Newton  
                     Department Head, Department of Statistics

THROUGH:            Walter V. Wendler  
                     Dean, College of Architecture

FROM:               James C. Smith  
                     Head, Department of Construction Science

DATE:               August 12 1997

RE:                  STAT 302

The purpose of this memo is to request your approval to require Construction Science students to take STAT 302.

The Department of Construction Science, College of Architecture, is submitting certain curriculum changes to improve its undergraduate curriculum. Proposed curriculum changes are summarized in the attachment.

One of the proposed changes is to require STAT 302 of all Construction Science students. We feel strongly that our students need to understand the fundamentals of Statistics because of the many applications in construction management. The American Council for Construction Education, our accrediting body, has placed increased emphasis on Statistics. We would anticipate that 100-150 COSC students would take the course each year.

APPROVED:  
Professor H.J. Newton  
Department Head

8/14/97
Date