

Civil, Construction, and Environmental Engineering Collection Development Policy Iowa State University Library

I. General Purpose

This policy provides a general and detailed description of the educational and research programs of the department of Civil, Construction, and Environmental Engineering (CCEE) and its affiliated programs. Within this context, the document describes the overall as well as the short and long-term efforts to support the library material and resource needs of the department and its programs.

In general, a systematic effort has been made to acquire major monograph works, core journals, and relevant conference proceedings that support the primary and secondary research needs of the department and its instructional programs. Among the factors that influence the selection of monographic works are their overall relevance to department programs, potential usage, and state, regional, and national availability. Potential usage is informed by a title-by-title systematic review of Horizon circulation data for works with previous editions and publications with similar subject coverage. Availability is determined by reviewing the holdings of candidate publications by our state and regional interlibrary loan partners in the OCLC *WorldCat* database. In addition, ISU interlibrary loan reports are systematically reviewed on a semi-annual basis to identify the current and emerging needs and interests of faculty and staff associated with the department.

A conscious effort has been made to provide access to electronic forms of key indexes and abstracts and core journals relevant to the educational and research foci of the department.

II. History

On July 2, 1862, President Abraham Lincoln signed into law a measure to establish one college in each state on federal land. Two months later, Iowa became the first state to accept the terms of the new law called the Morrill Land Grant College Act. Iowa Agricultural College - later renamed Iowa State College - opened less than five years later, offering degrees in agriculture and "mechanics." From the mechanics course, the school began almost immediately to develop programs in several branches of engineering.

The civil engineering curriculum was established in 1871, and the 26 members of Iowa State's first graduating class included four civil engineers. Civil Engineering officially attained departmental status in 1898. The first Masters and Ph.D. degrees in Civil Engineering were conferred in 1924 and 1927 respectively.

The building then known as Engineering Building #2 (now Town Engineering) was built during the years 1969-1971 to house the Civil Engineering and Aerospace Engineering Departments. The name of the Department was changed to Civil and Construction Engineering in 1988. Previously, Construction Engineering was a unit under Civil Engineering.

The Department's most recent self-study reports for Civil Engineering and for Construction Engineering were completed in June 2000.

Note: A comprehensive history of the department thorough 1955 was written by A.H. Fuller, professor and chair from 1920 to 1938 is available [<http://www.ccee.iastate.edu/fileadmin/www.ccee.iastate.edu/who-we-are/history.pdf>].

III. Iowa State University program

Profession

“Civil engineers plan, construct, and maintain fixed structures, or public works, related to roads, structures, water supply, sewer, flood control, and traffic.

Environmental engineers improve society's well-being through water purification, flood control, water quality monitoring, and waste renewal.

Geotechnical and materials engineers determine that the foundations and materials for buildings and roads are stable.

Structural engineers design buildings, bridges, and other structures that are subject to extreme temperatures, earthquakes, hurricane-level winds, and other severe environments.

Transportation engineers use statistical data and computer mapping to move people and goods more efficiently, safely, and comfortably—on land, air, and water” [<http://www.ccee.iastate.edu/fileadmin/www.ccee.iastate.edu/who-we-are/Recruitment/CCEE-brochure-06.pdf>].

Currently, approximately 780 undergraduate students are enrolled in Civil, Construction, and Environmental Engineering at ISU, including about 110 full-time graduate students. In 2006/2007 the department had 29 faculty members (ISU 2006-2007 Fact Book: 103) [http://www.public.iastate.edu/~inst_res_info/FB07files/pdf07/FB07all.pdf].

The department is the 7th largest in the country and routinely ranks among the nation's top engineering programs [<http://www.ccee.iastate.edu/>]. In 2004, the department awarded the 5th highest number of bachelor's degrees in the U.S. (American Society of engineering Education, 2004). In 2006, it was ranked as among the top 25 civil engineering departments (of 124 evaluated) U.S. News & World Report [<http://www.ccee.iastate.edu/who-we-are/its-a-fact.html>]

The department name was changed from the Civil and Construction Department to Civil, Construction, and Environmental Engineering with the approval of the Iowa Board of Regents in March 12, 2003 to reflect departmental emphases and priorities [<http://www.public.iastate.edu/~nscentral/releases/2003/mar/engnames.shtml>].

Research

The department specializes in five broad areas:

- Construction engineering
- Environmental engineering
- Geotechnical engineering
- Structural engineering
- Transportation engineering

[<http://www.ccee.iastate.edu/research.html>]

Construction Engineering

Current research projects seek solutions to the three functional areas of construction engineering and management: management techniques, construction operations, and construction methods.

Current research interests:

- Construction administration improvement
- Construction method improvement
- Asset management
- Training programs for Hispanic construction workers
- Laser scanning
- Object-oriented specifications
- Field data collection and analysis
- Machine control using global positioning systems
- Sustainable development
- Design-build / alternative contracting
- Engineering management and decision-making

- Construction technology to increase profitability
- Alternative energy sources

[\[http://www.ccee.iastate.edu/research/construction-engineering-research.html\]](http://www.ccee.iastate.edu/research/construction-engineering-research.html)

Innovative construction engineering and management research is also conducted at the Construction Management & Technology (CM&T) program at the Center for Transportation Research and Education.

[\[http://www.ccee.iastate.edu/research/construction-engineering-research.html\]](http://www.ccee.iastate.edu/research/construction-engineering-research.html)

Environmental Engineering

Research conducted by environmental engineering faculty is geared toward understanding the fundamental physical, chemical and biological principles of engineered and natural systems. The research has a strong emphasis on practical applications as demonstrated by bench-scale experimentation, pilot- and field-scale demonstration projects, and computer modeling and simulations.

Specifically, the faculty and staff research the following topics (researchers in parentheses):

— Environmental Engineering

- Physical-chemical treatment processes for drinking water and water reuse
- Municipal wastewater and biosolids treatment, and nutrient removal
- Anaerobic treatment of industrial and agribusiness wastewater
- Physical-chemical and aerobic biological treatment processes for industrial wastewater
- Resource recovery from waste and wastewater
- Energy recovery from animal wastes and agricultural products
- Fate of xenobiotics in engineered and natural systems
- Site remediation technologies for contaminated sites
- Pollution prevention and waste reduction

— Water Resources Engineering

- Surface water hydrology, quality monitoring and modeling
- Turbulence and mixing in lakes and rivers

[\[http://www.ccee.iastate.edu/research/environmental-engineering-research.html\]](http://www.ccee.iastate.edu/research/environmental-engineering-research.html)

A listing of research in Environmental Engineering is available
[\[http://www.ccee.iastate.edu/research/environmental-research.html\]](http://www.ccee.iastate.edu/research/environmental-research.html)

Geotechnical and Materials Engineering

Geotechnical faculty and research staff continue the legacy of cutting-edge research, investigating issues related to soil mechanics, geomaterials behavior and stabilization, in situ testing environmental geotechnology, and materials.

Their specialized areas of interest include:

- nondestructive testing and evaluation of transportation infrastructure
- analysis and design of pavement systems
- transportation soils and pavement materials engineering
- use of neural networks in engineering
- smart engineering systems design
- landslides and slope instability
- ground improvement
- numerical applications to geotechnical engineering
- foundation engineering
- supplementary cementitious materials
- concrete chemistry and microstructure
- pavement concrete mix design and durability
- self-consolidating concrete
- pervious concrete
- soil compaction
- soil-structure interaction
- in-situ testing
- asphalt materials characterization
- asphalt design, performance, and construction

- asphalt rheology
- pavement design

[\[http://www.ccee.iastate.edu/research/geotechnical-and-materials-engineering-research.html\]](http://www.ccee.iastate.edu/research/geotechnical-and-materials-engineering-research.html)

A listing of recent research in available Geotechnical and Materials Engineering is available [\[http://www.ccee.iastate.edu/research/geotechnical-research.html\]](http://www.ccee.iastate.edu/research/geotechnical-research.html).

Structural Engineering

Current research projects seek solutions to both safety and cost-related problems and have been the basis for setting industry standards and design criteria.

Specifically, their research focuses on the following areas:

- Bridges
- Composite Structures
- Condition Assessment
- Buildings
- Seismic Design
- Masonry
- Timber
- Transmission Towers

A listing of recent Structural Engineering research projects is available [\[http://www.ccee.iastate.edu/research/structural-research.html\]](http://www.ccee.iastate.edu/research/structural-research.html)

Transportation Engineering

Faculty researching transportation work closely with hundreds of transportation professionals at local, regional, state, and federal transportation agencies. They are active in both transportation engineering research and outreach, conducting more than \$6 million of projects annually.

They specialize in the following areas:

- **Transit and transportation policy**
- **Portland cement concrete pavement design, construction, and pavement rehabilitation**
- **Transportation applications of GIS, air quality issues, highway safety and modeling, remote sensing, vehicle activity modeling and traffic engineering**
- **Planning and managing dynamic high growth rate areas, adapting and blending technologies, and creating tools to improve transportation operations**
- **Photogrammetry, surveying, GPS, and GIS**
- **Transportation systems planning, safety, and traffic safety**
- **Applications of system analysis to transportation problems, transportation policy and economic analysis, and safety**
- **Transportation policy, new transportation technologies, telecommunications and the Internet**
- **Traffic engineering and geometric design**
- **Asset management, nondestructive pavement evaluation, decision support tools, and infrastructure management**
- **Transportation applications of GIS, transportation planning and modeling, safety/infrastructure management systems, remote sensing**

A listing of recent Transportation Engineering research projects is available [<http://www.ccee.iastate.edu/research/transportation-research.html>]

In addition to their teaching positions, several of the faculty hold positions with the Center for Transportation Research and Education (CTRE) [<http://www.ctre.iastate.edu/>] and ISU Extension.

Most transportation graduate research assistants hold appointments with CTRE. With a staff of 25 technical and support staff, CTRE maintains an impressive portfolio of transportation research projects

[<http://www.ctre.iastate.edu/research.htm>].

<http://www.ccee.iastate.edu/research/transportation-engineering-research.html>

The departmental facility Town Engineering is a modern building that houses faculty and departmental offices, classrooms, and research laboratories.
<http://www.ccee.iastate.edu/research.html>

Several laboratories provide hands-on experience practical education as well as support for faculty and student research. These include:

- **Environmental Engineering Research Laboratory (EERL)**

Geotechnical Engineering Labs

- **Mobile Concrete Laboratory**
- **Geotechnical Mobile Laboratory**
- **Asphaltic Cement Concrete (ACC) Laboratory**
- **Gerald and Audrey Olson Soil Mechanics Laboratory**
- **Materials Analysis and Research Lab (MARL)**
- **Portland Cement Concrete (PCC) Pavement and Materials Research Laboratory**
- **Spangler Geotechnical Laboratory**

Structural Engineering

- **Wallace W. and Julia B. Sanders Structures Laboratory**
- **Structural Engineering Research Laboratory**
- **Livesay Structural Materials Testing Facility (LSMTF)**

Transportation Engineering

- **Iowa Pavement Management Program (IPMP) Laboratory (CTRE)**
- **Iowa Traffic Safety Data Service (ITSDDS) Laboratory (CTRE)**
- **Remote monitoring Laboratory (CTRE)**
- **Systems development Laboratory (CTRE)**

CCEE Centers and Programs

- **Construction engineering**

- Geotechnical engineering
- Structural engineering
- Transportation engineering

[\[http://www.ccee.iastate.edu/research.html\]](http://www.ccee.iastate.edu/research.html)

Instruction

For Undergraduate Students, the department offers two undergraduate majors: Construction engineering and Civil Engineering, each with several emphasis areas. In addition, a concurrent degree program is available that allows a student to obtain a master's degree or MBA while pursuing an undergraduate degree [<http://www.ccee.iastate.edu/academics/concurrent-bsms.html>] [<http://www.bus.iastate.edu/MBA/FT/prospective/engineering.asp>].

The department offers graduate (M.S. and Ph. D.) programs in the following specializations: Construction Engineering and Management Environmental Engineering; Geotechnical and Materials Engineering; Structural Engineering; and Transportation Engineering. There are also two interdepartmental graduate programs – Environmental Science [<http://www.ensci.iastate.edu/grad/homepage.html>] and Transportation [<http://www.ctre.iastate.edu/mstrans/>], certificate and non-degree programs, and distance education graduate programs.

[\[http://www.ccee.iastate.edu/students/undergraduate-majors.html\]](http://www.ccee.iastate.edu/students/undergraduate-majors.html)
[\[http://www.public.iastate.edu/~catalog/2005-07/courses/ce.html\]](http://www.public.iastate.edu/~catalog/2005-07/courses/ce.html)

Select Courses (ISU Catalog 2005-2007)

- C E 111. Fundamentals of Surveying I
- C E 170. Graphics for Civil Engineering
- C E 203/204. Civil Engineering Synthesis I/II
- C E 304. Civil Engineering Project Management
- C E 326. Principles of Environmental Engineering
- C E 332. Structural Analysis I.
- C E 333. Structural Steel Design I.
- C E 334. Reinforced Concrete Design I.
- C E 355. Principles of Transportation Engineering.
- C E 360. Soil Engineering
- C E 372. Engineering Hydrology and Hydraulics
- C E 382. Design of Concretes.
- C E 420/520. Environmental Engineering Chemistry
- C E 428. Water and Wastewater Treatment Plant Design
- C E 446. Bridge Design
- C E 447. Building Design
- C E 460. Foundations

C E 473. Groundwater Hydrology
C E 485/486 Civil Engineering Design I/II
C E 502. Construction Project Engineering and Management.
C E 503. Construction Management Functions and Processes.
C E 510. Information Technologies for Construction
C E 513. Geodetic and Satellite Surveying
C E 517. Analytical Photogrammetry and Geographic Information Systems
C E 521. Environmental Biotechnology.
C E 522. Water Pollution Control Processes
C E 523. Physical-Chemical Treatment Process
C E 524. Air Pollution
C E 525. Industrial Wastewater and Resource Recovery
C E 527. Solid Waste Management
C E 529. Hazardous Waste Management
C E 532. Structural Analysis II.
C E 533. Structural Steel Design II.
C E 534. Reinforced Concrete Design II.
C E 535. Prestressed Concrete Structures
C E 536. Masonry and Timber Design.
C E 541. Dynamic Analysis of Structures
C E 547. Analysis and Design of Plate and Slab Structures
C E 550. Advanced Highway Design
C E 551. Urban Transportation Planning Models
C E 552. Traffic Safety, Operations, and Maintenance
C E 554. Advanced Technology in Transportation.
C E 560. Fundamentals of Soil Mechanics
C E 561. Applied Foundation Engineering
C E 562. Site Evaluations for Civil Engineering Projects.
C E 564. Application of Numerical Methods to Geotechnical Design
C E 565. Fundamentals of Geomaterials Behavior.
C E 567. Geomaterials Stabilization
C E 569. Environmental Geotechnology
C E 570. Applied Hydraulic Design
C E 571. Surface Water Hydrology
C E 572. Analysis and Modeling Aquatic Environments.
C E 573. Groundwater Hydrology.
C E 574. Environmental Impact Assessment.
C E 582. Advanced Pavement Analysis and Design.
C E 586 .Applied Concretes and Pavement
C E 587. Applied Portland Cement Concretes and Pavements

<http://www.public.iastate.edu/~catalog/2005-07/courses05-07.pdf>

The undergraduate programs of the Civil, Construction, and Environmental Engineering department are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET)

The programs were re-evaluated and reaccredited in 2006.

[\[http://www.ccee.iastate.edu/assessment.html\]](http://www.ccee.iastate.edu/assessment.html)

IV. Subject Boundaries

This collection includes materials classed in the Library of Congress call number ranges listed in Section XII below. Additional materials are chosen for the collection as needed to support teaching and research in the Department of Civil, Construction, and Environmental Engineering. Select publications within the LC call number ranges may be more appropriate for other subject collections, notably Agricultural and Biosystems Engineering, Architecture, Environment, General Engineering, or Reference.

V. General Collection Guidelines

A. Linguistic

English is the primary language of the collection, though works in other languages may be selected if they are of sufficiently high quality or interest.

B. Geographical Areas

No geographical areas are excluded, though primary emphasis is on literature from English-speaking countries. Works which emphasize the law, regulations or standards that apply in the United States are collected more comprehensively than those emphasizing the law, regulations or standards specific to any other country or group of countries not including the United States.

C. Types of Materials Collected.

Monographs, monographic series, journals, proceedings, society publications, and handbooks are purchased to support research, teaching and learning. Societies publications are well represented. Periodicals represent a large part of the collection. Theses and dissertations produced at Iowa State University are comprehensively collected under an arrangement between the ISU Library and the Thesis Office. Indexes, abstracts and other reference materials are collected under a separate policy for Reference.

D. Format of Materials Collected

No format is excluded except in cases when special equipment not owned by the Library would be needed to use the work in question. For example, floppy disks formatted for Commodore 64 computers would not be collected.

VI. Specific Collection Guidelines

Works on building construction are frequently purchased for this collection, however, works which deal primarily with the artistic rather than the structural design of buildings should be referred to the bibliographers for Architecture.

Some works in the areas of structural engineering, soil mechanics, environmental technology, or building construction may more closely fit the current research interests of faculty or students in Agricultural and Biosystems Engineering, and should be referred to the consideration of the bibliographer for that area.

Works dealing with policymaking and environmental engineering should be considered closely to determine whether or not they fit most appropriately in the collection for Civil and Construction Engineering.

VII. Other Resources Available

American Society of Civil Engineers

Founded in 1852, ASCE represents more than 123,000 civil engineers worldwide, and is America's oldest national engineering society. ASCE advances professional knowledge and improves the practice of civil engineering as the lead professional organization serving civil engineers and those in related disciplines; the focal point for development and transfer of research results, and technical, policy and managerial information; and the catalyst for effective and efficient service through cooperation with other engineering and related organizations. More than 6,200 civil engineers serve on over 600 national committees that produce the Society's annual convention, specialty conferences, publications, policies, building codes and standards, and other services.

Northwestern University Transportation Library

The Northwestern University Transportation Library was founded in 1955 to support the curricula and research programs of the Transportation Center and the Center for Public Safety of Northwestern University. With over 400,000 volumes, the Transportation Library of Northwestern University is one of the largest transportation information centers in the world, encompassing information on all forms of transportation, including: air, rail, highway, pipeline, water, urban transport and logistics. It includes a significant collection on law enforcement, police management and traffic enforcement. Its collection of environmental impact statements is one of the most complete in the world.

The Transportation Library's staff produce two major bibliographic resources, Current Literature in Traffic and Transportation, published quarterly,

and TRAN, a web based periodical index of transportation and law enforcement articles and conference proceedings.

National Transportation Library (NTL)

U.S. Department of Transportation's Bureau of Transportation Statistics (BTS) created the National Transportation Library (NTL), a collection of electronic full-text documents available via the Internet and CD-ROM, as one response to the needs of the planners of the transportation system. The National Transportation Library contains documents and databases provided from throughout the transportation community. All material in the National Transportation Library is in the public domain or provided by the authors free of any restriction on reproduction. One component of the NTL is TRIS Online, a collaborative effort between the Transportation Research Board, National Research Council, National Academies, and the BTS to provide a public-domain, web-based version of the Transportation Research Information Services (TRIS) bibliographic database.

IX. Cross-references to Collection Policies

Agricultural and Biosystems Engineering / Pali Kuruppu)

Art & Design / Ed Goedeken

Architecture / Ed Goedeken

Chemical and Biological Engineering / Gerry McKiernan

Community & Regional Planning / Ed Goedeken

Environment / Gerry McKiernan

General Engineering / Kris Stacy-Bates

Geological & Atmospheric Sciences / Lorrie Pellack

Logistics, Operations & Management Information Systems / Jeff Kushkowski

Mathematics / Kris Stacy-Bates

Natural Resource Ecology and Management / Heather Lewin

Reference / Lorrie Pellack

X. Creation date

2000 (Kristine K. Stacy-Bates)

XI. Revision History

January 30, 2008 (Gerry McKiernan)

XII. LC Classes and Ranges

TA495-1280

TC

TD

TE1-450

TG
TH1-455
TH900-1101
TH1201-1635
TH1715-7975
TN1-257
TN272-380
TN496-580
TN799.5-859
UG330-620
VM1-965

XIII. Bibliographer name

Gerry McKiernan (current)

Kristine K. Stacy-Bates (former)