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# Chemical and Biomolecular Engineering Collection Development Policy

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## I. GENERAL ACADEMIC PROGRAM INFORMATION

The Chemical & Biomolecular Engineering Department offers the Bachelor of Science degree, the Master of Science Chemical Engineering (M.S.Ch.E) degree and the Doctor of Philosophy in Engineering with Specialization in Chemical and Biomolecular Engineering (Ph.D.) degree. The Ph.D. is offered through the Unified Ph.D. Program in Engineering.

Graduate courses include transport phenomena and operations, separation, thermodynamics and kinetics, diffusion, chemical engineering design, chemical processes, process control, automated operations, polymers, biochemical engineering, air pollution assessment and control, membrane principles and control, and system analysis. Research emphasis of the Department include absorption studies, distillation, applied thermodynamics, crystallization from solution, polymerization kinetics, heat and mass transfer, phase equilibrium, direct energy conversion, reaction kinetics, computer-aided design, process economics, and alcohol blended fuels.

No significant overlap occurs within UNL. The Department cooperates with other departments to reduce overlap and duplication. The Department seeks to strengthen its relationship with UNMC.

The Department of Chemical and Biomolecular Engineering offers a course of study designed for students who plan careers in a wide variety of industries, ranging from the chemical and process industries to biotechnology, electronics, and the environment. Students receive training in the basic subjects of mathematics, English, and physics in common with other students in engineering, but in addition receive extensive training in chemistry. In various courses the emphasis is placed on the fundamental principles of fluid mechanics, heat transfer, mass transfer, separation processes, thermodynamics, kinetics, and process dynamics, as well as process economics and design of chemical processes.

Graduates are qualified to undertake work in research, design, development, production, maintenance, and technical sales in a wide variety of industries including chemicals, petroleum, petrochemicals, rubber, plastics, agricultural chemicals, food, biotechnology, pharmaceuticals, paper, fabrics, aircraft, automotive, electronics, energy conversion, and environmental pollution prevention and control. The Department of Chemical and Biomolecular Engineering is located in Othmer Hall. A state-of-the-art unit operations laboratory used to give hands-on chemical process experience is located there. Laboratory equipment is provided for the study of fluid mechanics, heat transfer, mass transfer, staged operations, process control, thermodynamics, reaction kinetics, and polymerization. The department operates its own microcomputer facility. Additional research equipment is available for independent and graduate study in several areas.

Some Important Research Areas:

- Developing new regenerative medical materials and therapies using bio- and nanotechnologies to speed the repair and regrowth of bone, blood vessels and soft tissues in vivo
- Developing cutting edge genomic techniques like ultra-fast polymerase chain reaction (PCR) to search for emerging disease threats such as antibiotic-resistant tuberculosis
- Using proteomic instruments like a specialized mass spectrometer designed to search for new genetically engineered protein medicines
- Developing a new pliable bandage that can stop fatal bleeding from trauma in civilian and military applications
- Partnering with international healthcare systems to develop abundant supplies of hemophilia medicines from the milk of genetically engineered livestock to treat 80% of the world's hemophilia patients
- Discovering a device to give robots a human sense of touch using nanotechnology
- Developing a process for sustainable biofuels production.

CHME 453, Chemical Engineering Process Design, has been designated as an ACE (Achievement-Centered Education) course.

The accrediting body for the Department is the Accreditation Board for Engineering and Technology.

## II. GEOGRAPHICAL COVERAGE

There are no geographical limitations at the research level. Emphasis is upon U.S. and British works at the basic and minimal levels.

## III. CHRONOLOGICAL COVERAGE

No time limitations exist at the research level. The study level emphasizes materials since 1875 to date.

## IV. IMPRINT DATE

Primary emphasis is on current materials. Retrospective materials are obtained to complete backfiles, strengthen areas of research activity, and replace worn items.

## V. FORMAT/TYPE AND LEVEL OF MATERIALS

Reference materials collected for the Department include dictionaries, encyclopedias, handbooks, indexes and abstracts. Primary indexing and abstracting services are *SciFinder Scholar (includes Medline), Biological Abstracts, and Compendex.* Conference and symposium are actively collected at the research level.

## VI. LANGUAGES

Materials are collected in English at the research level. European languages are collected upon special request.

## VII. SPECIAL FACTORS

Publications of the following organizations and agencies are acquired: American Institute of Chemical Engineers and American Chemical Society. Other organizations publishing literature useful to chemical engineers are the American Society for Testing and Materials, the National Bureau of Standards, International Standards Organization, American National Standards Institute, and the U.S. Patent and Trademark Office. The Engineering Library is a U.S. Patent and Trademark and Depository Library Program Library and the publications of the U.S. Patent and Trademark Office are included in the Engineering Library collection. All patent search aids that are provided by the U.S. Patent and Trademark Depository Library Program are retained.

Works by and about authors and field authorities are collected at the research level. The chemical and biomolecular engineering literature is maintained in the Engineering Library where the ASTM and ANSI standards are housed. The C.Y. Thompson Library contains materials related to pesticide manufacture and use and pollution control. Other related material are available in Love Library.

Online access to the *CRC Handbook of Chemistry and Physics* is maintained permanently in updated version. Many of the CRC handbooks are housed in the Engineering Library collection and are updated as appropriate.

## VIII. CLASSIFICATIN AND INTENSITY LISTING

(The following are listed by LC Class, Subject, and then by Intensity Level)

Materials excluded from collection are laboratory manuals, poplar and juvenile works, catalogs, and undergraduate textbooks.

QC 176.8 Nanostructures

QH 345 Biochemistry RESEARCH

QP 91-99.5 Blood RESEARCH

RB 145 Hematology RESEARCH

R856-857 Biomedical Engineering, Tissue Engineering RESEARCH

T174.7 Nanotechnology

TA 418.9 Nanostructured materials
TP 1-151 Chemistry, technical periodical, serial, general, history, and reference literature RESEARCH

TP 155-157.75 Chemical Engineering, plants, processes, environmental chemistry – industrial applications RESEARCH

TP 156-159 Apparatus and supplies STUDY

TP 187-197 Government ad industrial laboratories STUDY

TP 200-210 Chemical industry RESEARCH

TP 213-217 Inorganic acids RESEARCH

TP 222-223 Alkalies RESEARCH

TP 230-240 Salts RESEARCH

TP 242-244 Gases RESEARCH

TP 245 Other inorganic chemicals RESEARCH

TP 247-248 Organic chemicals and preparations, recombinant blood proteins RESEARCH

TP 249-261 Industrial radiochemistry RESEARCH Industrial photochemistry RESEARCH Industrial electrochemistry RESEARCH

TP 259-263 Water in chemical industry. Water softening RESEARCH

TP 265 Chemistry of fire and fire prevention RESEARCH

TP 267 Fireproofing of fabrics RESEARCH

TP 268-299 Explosives and pyrotechnics RESEARCH

TP 315-360 Fuel RESEARCH

TP 339. Biomass energy RESEARCH

TP 361-365 Inflammable liquids and gases RESEARCH

TP 368-482 Food processing and manufacture, low temperature engineering STUDY

TP 490-497 Refrigeration and icemaking RESEARCH

TP 493.5 Thermoelectric cooling (freezing food) BASIC

TP 500-517 Fermentation industries STUDY

TP 544-565 Wine and winemaking BASIC

TP 569-588 Brewing and malting BASIC

TP 589-617 Distilling BASIC

TP 620-659 Nonalcoholic beverages BASIC

TP 670-684 Oils, fats, and waxes BASIC

TP 685-699 Mineral oils and waxes RESEARCH

TP 700-746 Illuminating industries (non-electric) STUDY

TP 751-770 Gas industry RESEARCH

TP 785-823 Clay industries STUDY

TP 825-842 Architectural ceramics BASIC

TP 845-869 Glass and glassmaking BASIC

TP 870-873.5 Artificial minerals, stone, and gems BASIC

TP 875-889 Cement industries RESEARCH

TP 890-933 Textile processing BASIC

Tp 934-944 Paints, pigments, varnishes, etc. STUDY

TP 946-949.5 Ink manufacture BASIC

TP 950-994 Miscellaneous organic chemical industries STUDY

TP 995-996 Utilization of waste STUDY

TP 997 Wood distillation RESEARCH

TP 1001-1114 Plastics periodicals, serial, general, and reference literature RESEARCH

TP 1116-1122 History. Biography. Gneral works. General special STUDY

TP 1127 Study and teaching STUDY

TP 1130-1132 Handbooks, manuals, tables, etc. RESEARCH

TP 1133 Plastics plants and equipment RESEARCH

TP 1140-1175 Manufacturing processes RESEARCH

TP 1177-1185 Plastics types and forms RESEARCH