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1961-62

Undergraduate In
New Mexico State U

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NEW MEXICO STATE UNIVERSITY BULLETIN

PART FOUR

THE COLLEGE OF ENGINEERING

UNDERGRADUATE INFORMATION

A Note for Visitors To the Campus

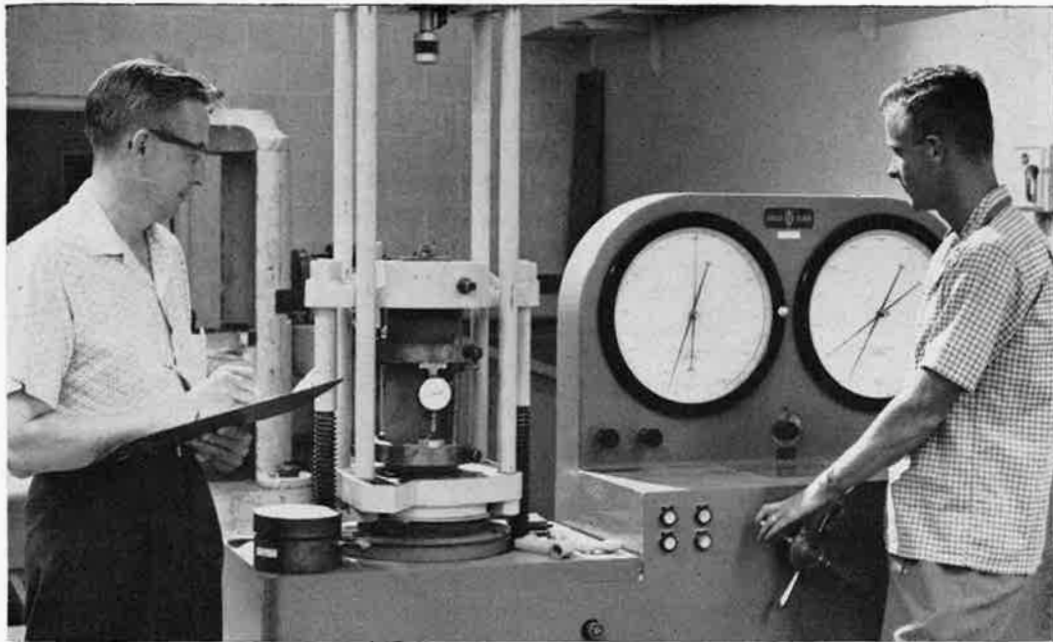
Visitors are welcome to the campus of New Mexico State University. Campus offices are open daily, except for holidays noted in the calendar, Monday through Friday from 8 a.m. to 5 p.m. Saturday hours are 8 a.m. to 12 noon.

How the State University Bulletin Is Organized

This bulletin is printed in five separate sections:
Undergraduate General Information
College of Agriculture and Home Economics
College of Arts and Sciences
College of Engineering
College of Teacher Education

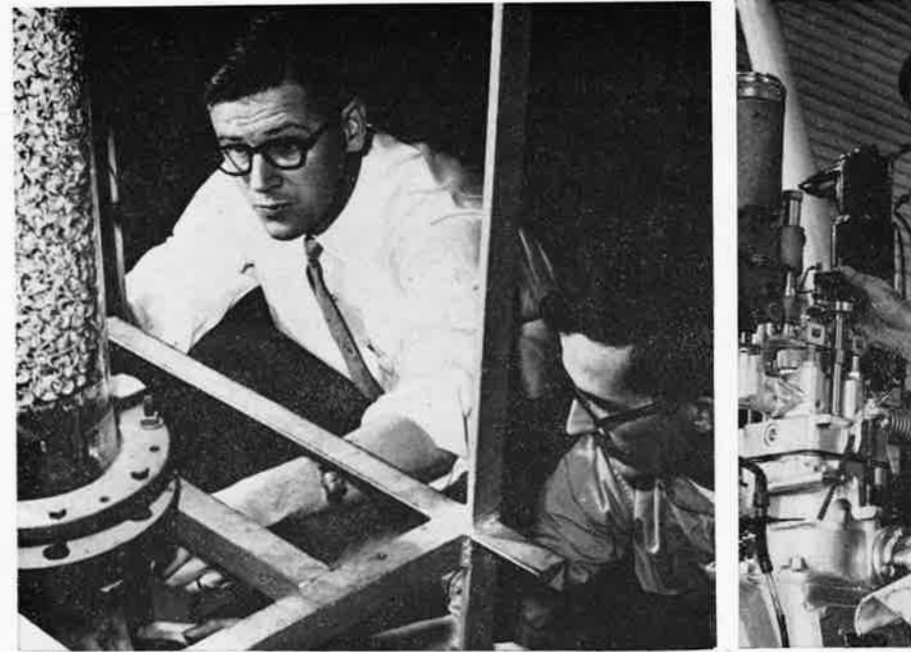
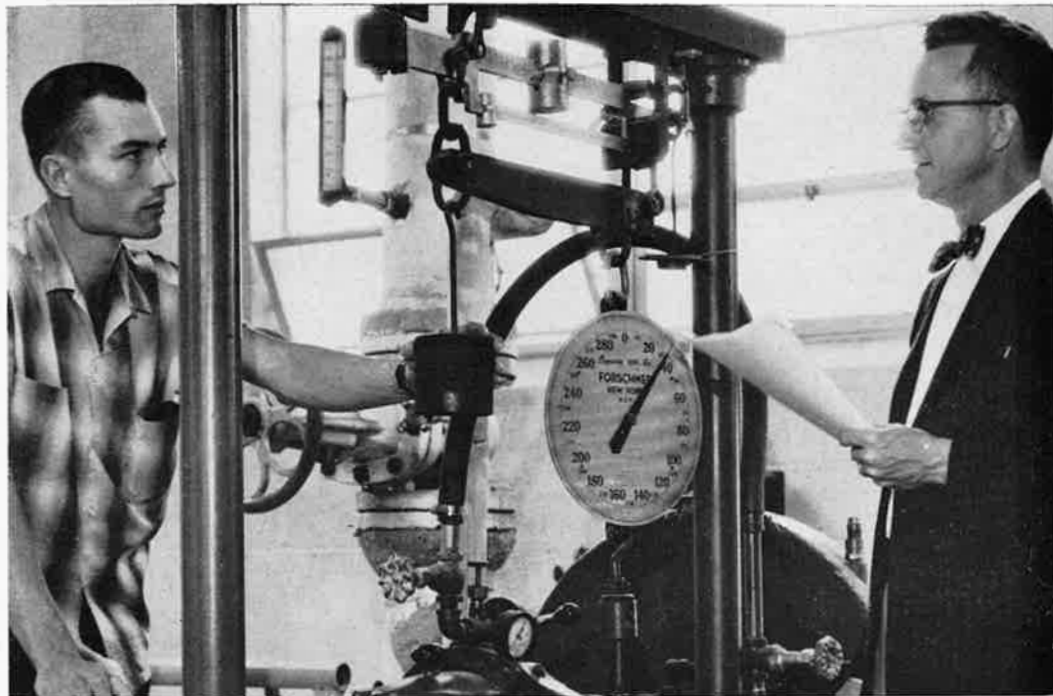
The university also publishes each spring the Graduate Bulletin with a complete description of the university's graduate program.

INFORMATION ABOUT THE COLLEGE
TYPICAL CURRICULUM
DESCRIPTION OF COURSES



Materials testing in civil engineering laboratory uses this modern 60,000-pound hydraulic testing machine. Many different materials can be tested by the device to learn their strengths.

How to conduct hynamometer test measuring output of steam turbine is explained in this mechanical engineering laboratory.



Chemical engineering student and instructor collaborate on study of water flow through packed column, used for testing absorption of gas.

Machine testing in laboratory determines strengths for particular applications.

Huge volumes of water are delivered by this laboratory device to test models of structures used in hydraulics engineering.

Traditional stance of engineer is shown as this student working as a co-op member on a highway department project.



Courses for Majors

316. Agricultural Processing and Utilities 4 credits (3+3P)

Fundamentals of electrical energy and their application to processing of agricultural crops; farm sanitation and water supply. Corequisites: EE 401 and ME 341.

426. Farm Machinery Design 3 credits (2+3P)

Design, development and testing of farm machinery to meet functional and structural requirements of modern farming practices. The emphasis is on component design with respect to each operation. Prerequisites: ME 234 and CE 301.

427. Farm Power 3 credits (2+3P)

A study of design, operation and performance of internal combustion engines and farm tractors. Prerequisites: ME 234, ME 341, and CE 301.

435. Farm and Ranch Structures 4 credits (3+3P)

Environmental and functional requirements of farm and ranch structures; materials of construction and design of structural members. Problems involve planning and design, the preparation of working drawings and specifications with emphasis on economy and efficiency. Prerequisite: CE 301 and ME 341.

440. Agricultural Engineering Problems 2 - 4 credits

Problems involving application of the principles of agricultural engineering. Open to seniors in agricultural engineering only.

445. Engineering for Soil and Water Conservation 4 credits (3+3P)

Survey of causes, kinds, and extent of erosion. Elements of hydrology; design of water control structures such as terraces, outlet channels, drop structures, diversions, reservoirs, spillways; gully erosion control. Uses of vegetation, cultural practices, and land grading in controlling erosion and water loss. Prerequisites: Agron 251 and 252, ME 338.

447. Irrigation and Drainage Engineering 4 credits (3+3P)

A study of irrigation principles and practices and their relation to design of farm irrigation system and structures, the preparation of land for irrigation, measurement of water, laws and institutions, and the design of drainage systems for agricultural purposes. Prerequisites: CE 254, ME 338, CE 431.

449. Seminar 1 credit

Required of seniors majoring in agricultural engineering.

CHEMICAL ENGINEERING

PROFESSOR SHIRES, Head of the Department
ASSOCIATE PROFESSOR HAYES

TYPICAL CURRICULUM

Chemical engineering is concerned with those principles which are basic to the industries concerned with the chemical and physical changes of materials.

The chemical and allied industries rank high in money spent on construction of new and expansion of present plants. They offer to the graduate chemical engineer a large number of outstanding opportunities for employment.

Among the industries using large numbers of chemical engineers are: chemicals, plastics, rubber, petroleum products insecticides, fertilizers, atomic energy, and many others. Chemical engineers are employed in various positions in the field of production, development, research, design, sales and management.

TYPICAL CURRICULA

FRESHMAN PROGRAM

(Common to all Engineering Curricula)

SOPHOMORE YEAR

First Semester		Second Semester	
Ch.E. 215, Fund. Calculations	3	C.E. 225, Ind. Fuels, Water and Lubricants (2+3P)	3
Chem. 321, Quantitative Analysis (2+6P)	4	Ch.E. 350, Indust. Stoichiometry	3
Math. 231, Calculus I	4	M.E. 234, Dynamics	3
C.E. 233, Statics	3	Math. 232, Calculus II	3
Econ. 253, Intro. to Economics	3	Phys. 270, Wave Motion	3
M.S. or A.S. 201, Second Year Basic	2	M.S. or A.S. 202, Second Year Basic	2
			19

JUNIOR YEAR

First Semester		Second Semester	
Ch.E. 440, Unit Operations I	3	Ch.E. 441, Unit Operations II	3
Math. 371, Introduction to Applied Mathematics	3	C.E. 301, Mechanics of Materials	3
Chem. 311, Org. Chem. (3+3P)	4	Chem. 312, Org. Chem. (3+3P)	4
Chem. 433, Physical Chem. (3+3P)	4	Chem. 434, Physical Chem. (3+3P)	4
Chem. 341, Chemical Literature I	1	E.E. 301, Fund. of Elec. Engr.	1
M.E. 341, Thermodynamics	3		
			18

Chemical Engineering

SENIOR YEAR	
First Semester	Second Semester
Ch.E. 430, Chem. Tech. 3	Ch.E. 446, Chem. Engr. Lab. (6P) 2
Ch.E. 447, Chem. Engr. Designs 3	Ch.E. 448, Plant Design (1+6P) 3
Ch.E. 445, Chem. Engr. Lab. (3P) 1	Ch.E. 490, Chem. Engr. Kinetics 3
Ch.E. 488, Chem. Engr. Thermo. 3	Ch.E. 375, Metallurgy 2
Ch.E. 465, Unit Operations III 3	Ch.E. 486, Seminar 1
*Humanistic-Social Study Elective 3	Humanistic-Social Study Elective 3
16	*Electives 3
	17

*Electives must be approved by the head of the Dept.

DESCRIPTION OF COURSES

- 215. Fundamental Calculations** 3 credits
Calculations of material balances involving weight, molar, and volume relationships.
- 225. Industrial Fuels, Water, and Lubricants** 3 credits (2+3P)
Constitution, properties and combustion of solid, liquid, and gaseous fuels. Natural waters, and their treatment for industrial uses. Theory of lubrication as applied to industrial machinery. The evaluation of lubricants based on standard tests.
- 350. Industrial Stoichiometry** 3 credits
Principles of chemical engineering calculations; heat and material balances of typical industrial processes; methods of obtaining data necessary for solving industrial problems.
- 375. Metallurgy** 2 credits
The normal structure of the ferrous, common non-ferrous metals and their alloys. The basic principles of heat treatment and its effect upon structure. Theory of hot and cold metal working. Extraction of metals from their ores is briefly reviewed.
- 380. Unit Operations I** 3 credits
A study of mass transfer and energy transfer involving such operations as transportation and flow of fluids, flow of heat, etc. Prerequisites: Ch.E. 350; Math. 232.
- 381. Unit Operations II** 3 credits
A study of the simultaneous flow of mass and energy involving such operations as distillation, absorption, evaporation, etc. Prerequisite: Ch.E. 440.

430. Chemical Technology 3 credits
A study of the manufacturing methods of heavy inorganic chemical first half; and of the manufacturing processes for organic material second half. Prerequisite: Ch.E. 350.

445. Chemical Engineering Laboratory 1 or 2 credits (3P or 6P)
Heat balances, crushing and grinding, fluid flow involving both friction losses and rate of flow. Prerequisite: Ch.E. 440.

446. Chemical Engineering Laboratory 2 credits (6P)
Laboratory work dealing with the unit operations of heat transfer, filtration, absorption, drying, etc. Prerequisites: Ch.E. 441, 445.

447. Chemical Engineering Design 3 credits
Consideration of the fundamental principles involved in the design of a plant, process, or product. The part played by availability of various raw materials, different methods of manufacturing and plant location. Prerequisite: Ch.E. 440.

448. Chemical Engineering Plant Design 3 credits (1+2P)
A comprehensive problem consisting of general layout, design and arrangement of equipment for some specific plant. Estimated cost of constructing and operating plant. The unit cost of finished product. Prerequisites: Ch.E. 447, Ch.E. 441.

460. Research 1 or 3 credits
The investigation of some problems in chemical engineering. Consent of Department Head. Elective for seniors.

465. Unit Operations III 3 credits
A continuation of Ch.E. 381 Unit Operations II. Prerequisite: Ch.E. 381.

484. Introduction to Nuclear Reactors 3 credits
A study of the basic principles of radioactivity, and their application to some of the chemical and engineering problems arising in the construction and operation of nuclear reactors. Prerequisite: M.E. 341.

488. Chemical Engineering Thermodynamics 3 credits
The application of thermodynamics to the field of chemical engineering. Prerequisites: M.E. 341 or Chem. 481.

486. Seminar 1 credit
A discussion of current topics in chemical engineering. Prerequisite: senior standing.

490. Chemical Engineering Kinetics 3 credits
A study of homogeneous and heterogeneous reaction kinetics with emphasis placed on the application to industrial reactor design. Prerequisites: Ch.E. 488, Math. 371.