990. *Special Problems*

Fall, Winter, Spring, Summer. 1 to 6 credits. Approval of department.

999. *Doctoral Dissertation Research*

Fall, Winter, Spring, Summer. 1 to 36 credits. Approval of department.

COMMUNICATION ARTS AND SCIENCES (COLLEGE OF) CAS

492. *Special Topics*

Fall, Winter, Spring, Summer. 1 to 6 credits. Approval of department.

Varied topics pertaining to the study of communication processes.

892. *Special Topics*

Fall, Winter, Spring, Summer. 1 to 6 credits. Approval of department.

Varied topics pertaining to advanced study of communication processes.

999. *Doctoral Dissertation Research*

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

Dissertation research for the doctoral program in Mass Media.

COMMUNITY HEALTH SCIENCE CMS

College of Human Medicine
College of Osteopathic Medicine

510. *Health, Medical Care and Society*

Summer. 2 to 5 credits. Admission to a college of medicine or approval of department.

The role of social, cultural and psychological variables in health and illness and in health care delivery. Special attention to patient/physician behavior and health maintenance, health education and patient compliance.

512. *Epidemiology and Biostatistics*

Fall. 2 to 5 credits. Admission to a college of medicine or approval of department.

Epidemiology and biostatistics in clinical medicine and health care delivery. Evaluation of medical investigations. Applicability to preventive medicine and health maintenance. Field experiences and seminars in community medicine.

513. *Medical Jurisprudence*

Fall. 2 to 5 credits. Admission to a college of medicine or approval of department.

Basic concepts of the legal process and the health care system. Law suits, malpractice, statutory and case law. Insurance and tax consideration. Continuing field experiences and seminars in community medicine.

514. *Topics and Issues in Health Care Delivery I*

Summer. 2 to 5 credits. Admission to a college of medicine or approval of department.

Medical economics, health care financing and organization, manpower utilization, resource allocation, health services administration, patterns of medical practice, politics of health care. Continuing field experiences and seminars in community medicine.

515. *Topics and Issues in Health Care Delivery II*

Fall. 2 to 5 credits. Admission to a college of medicine or approval of department.

Continuation of CMS 514.

516. *Field Experience in Community Medicine I*

Winter. 1 to 5 credits. Admission to a college of medicine or approval of department.

Continuation of CMS 515 field experiences and seminars.

517. *Field Experience in Community Medicine II*

Spring. 1 to 5 credits. Admission to a college of medicine or approval of department.

Continuation of CMS 516 field experiences and seminars.

518. *Aging: Clinical and Community Perspectives*

(H M 534.) Spring. 4(3-3) Medical student or approval of instructor.

Multi-dimensional aspects of aging and their application to long-term, continuing care of the chronically ill older adult.

519. *Health Education in Clinical Settings*

Spring. 3(2-3) Approval of instructor.

Application of concepts from social and behavioral sciences to clinical health education through laboratory and classroom experiences including development of a model educational plan for a specific health problem.

520. *Biostatistical and Epidemiological Reasoning*

Fall. 4(4-0) Approval of instructor. Interdepartmental with the Department of Statistics and Probability.

Concepts and principles from biostatistics and epidemiology to facilitate critical reading literature relevant to clinical medicine and community health. Emphasis on design and interpretation.

521. *Evaluation of Health Services*

Spring. 2 to 4 credits. Approval of instructor. Interdepartmental with the College of Nursing.

Use of experimental and quasi-experimental designs. Cost benefit and efficiency models. Assessment of health services delivery.

530. *Care of the Elderly*

Fall, Spring. 3(2-2) Student in H M, OST or other clinical program or approval of instructor. Interdepartmental with and administered by the Department of Family Practice.

Case studies of the care of the elderly based on the physician patient-interaction with elderly persons and their families. Family systems applications to health care. Associated clinical experience.

543. *Health and Adaptation of the Elderly*

Fall. 3(3-0) Baccalaureate degree in health science; approval of instructor. Interdepartmental with and administered by the College of Nursing.

Health and adaptation of the aged individual experiencing the normative biophysiologic and psychodevelopmental changes related to the aging process.

590. *Special Problems in Community Medicine*

Fall, Winter, Spring, Summer. 1 to 8 credits. May reenroll for a maximum of 32 credits. Approval of department.

Each student will work under direction of a faculty member on an experimental, theoretical or applied problem.

600. *Preventive Medicine and Public Health Clerkship*

Fall, Winter, Spring, Summer. 2 to 12 credits. Successful completion of first two years of medical school.

Clinical and community experiences in personal and community health services, environmental health, and other health and medical programs which meet health needs of various population groups.

605. *Occupational Health Clerkship*

Fall, Winter, Spring, Summer. 6 to 12 credits. May reenroll for a maximum of 12 credits. Grade P in all courses offered in terms 1 through 8.

The occupational health program in an industrial setting. Exposure to delivery of medical care to workers, treatment of industrial accident injuries. Review of safety and preventive medicine programs.

607. *Ambulatory Care Clerkship*

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. H M 602. Interdepartmental with the departments of Family Practice, Medicine, and Pediatrics and Human Development. Administered by the Department of Family Practice.

Outpatient experience, lasting an equivalent of 48 half days over a period of six months or more, emphasizing continuous and comprehensive patient care under the supervision of appropriate physicians.

610. *Geriatric Clerkship*

Fall, Winter, Spring, Summer. 2 to 12 credits. Successful completion of first two years of medical school.

Clinical and community experiences including history taking, patient assessment, development and use of management and care plan and use of community resources for the long term care of the aged.

619. *Clinical Health Education Clerkship*

Fall, Winter, Spring, Summer. 6 to 12 credits. May reenroll for a maximum of 12 credits. Grade P in all courses offered in terms 1 through 8.

Clinical experiences for developing and applying skills in patient and family health education. Identification of behavioral components of health care. Assessment of educational needs of patient and family.

620. *Directed Studies in Community Medicine*

Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 24 credits. Approval of department.

Individual projects on special problems related to community medicine.

630. *Alcoholism Clerkship*

Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. COM students: Satisfactory completion of terms 1 through 8. CHM students: Satisfactory completion of Phase II.

Diagnosis, inpatient and outpatient management of alcoholics.

COMPUTER SCIENCE CPS

College of Engineering

115. *Introduction to Computing*

Fall, Winter, Spring, Summer. 3(3-0) Not open to students with credit in CPS 120, LBS 124, CPS 130 or CPS 251.

Applications of computers in business, education, government and industry. Introduction to computing systems and programming in BASIC.

120. *Computer Programming for Engineers and Scientists*

Fall, Winter, Spring, Summer. 3(3-0) MTH 111 or concurrently. Students may not receive credit in both CPS 110 and CPS 120.

FORTRAN programming, number systems and basic computer structure. Applications from engineering, mathematics and physical science.

124. *APL-Computer Programming for Scientists*

Fall, Winter, Spring. 3(3-0) LBS 112 or concurrently. Interdepartmental with and administered by Lyman Briggs School.

APL programming; interactive programming techniques; arithmetic, logical, and extended APL operators; functions, applications to concurrent topics in mathematics; principles of operators of time-shared computers.

130. *Computers in Society*

Fall. 3(2-1)

A non-technical introduction to computers, programming, applications and to the computer revolution. Topics: automation, data banks, privacy, the engineered society.

251. *Algorithms and Computing I*

Fall, Winter, Spring. 3(2-3) MTH 112.

Algorithms, numeric and character data, data types, variables, expressions, decision structures, arrays, and procedures. Design and implementation of algorithms in PASCAL.

252. *Algorithms and Computing II*

Winter, Spring, Summer. 3(2-3) CPS 251, MTH 113.

Problem solving methods, numeric computation, string processing, number and character representation, data structures, and programming style. Design and implementation of algorithms in PASCAL.

292. *Selected Topics*

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits when different topics are taken.

Topics selected will in general supplement and enrich existing courses, and lead to the development of new courses.

295. *Independent Study*

Fall, Winter, Spring, Summer. 1 credit. May reenroll for a maximum of 4 credits in CPS 295 and CPS 495 combined. Approval of department.

Independent undergraduate research in computer science.

300. *Computer Programming*

Fall, Winter, Spring, Summer. 3(3-0) CPS 120 or approval of department; MTH 111.

Development and implementation of numeric and non-numeric algorithms using FORTRAN. Number systems and representations of data. Concepts of storage, processors and compilers.

301. *FORTRAN Laboratory*

Fall, Winter, Spring, Summer. 1(0-3) CPS 252 or concurrently. Students may not receive credit in CPS 301 and in CPS 120.

Programming laboratory using FORTRAN.

304. *PASCAL Programming*

Fall, Summer. 2(1-3) CPS 300, MTH 113. Students with credit in CPS 251 may not receive credit in CPS 304.

Programming style, problem solving methods, linear data structure, trees. Design and implementation of algorithms in PASCAL.

305. *List Processing Languages*

Winter. 3(3-0) CPS 300 or CPS 301 or approval of department.

Development and implementation of computer programs in string and list processing languages. Emphasis upon non-numeric applications. Structure of a simple list processing language. Comparison of list processing languages.

306. *COBOL Programming*

Spring. 3(3-0) CPS 115 or CPS 120 or CPS 251.

The mechanics of COBOL, a business data processing language; presented with illustrative problems.

311. *Assembly Language and Machine Organization*

Fall, Winter. 4(3-2) CPS 252, CPS 301 or CPS 300, CPS 304, MTH 214 or LBS 216.

Machine structure, registers and operations. Programming in assembly language. Discrimination of assembler, loader and execution tasks. Comparison with interpretive processing. Introduction to program and data structures. Subprogram linkage.

312. *Generative Coding and Information Structures*

Winter, Spring. 4(3-2) CPS 311.

Macro facilities, conditional assembly, interaction with monitor, assembly language I/O. Use of buffer, stack, queue, deque, tree and list data structures. Interpreters, recursive routines.

313. *Introduction to System Programming*

Fall, Spring, Summer. 4(3-2) CPS 312.

Loaders and operating systems. Study of existing batch and time-sharing systems. Design and implementation of part of an operating system. Segments, overlays, multi-processing and multi-programming.

321. *Introduction to Discrete Structures*

Fall, Winter. 3(3-0) CPS 252 or CPS 300, MTH 214 or LBS 216.

Set operations, relations, functions and mappings. Boolean algebra, Boolean matrices, truth tables, minimization. Propositional and predicate calculus, well formed formulas, precedence relations, quantifiers. Applications to computer science.

322. *Introduction to Theory of Computing*

Winter, Spring. 3(3-0) CPS 321, MTH 215 or LBS 217.

Finite-state machines, stack automata. Turing machines. Effective procedures and computability. Introduction to recursive functions. Symbol manipulation systems.

340. *Computer Aided Manufacturing*

(341.) Spring. 4(3-2) CPS 115 or CPS 120 or CPS 251 or LBS 124. Interdepartmental with and administered by the Department of Metallurgy, Mechanics and Materials Science.

APT and COMPACT numerical control languages. Group technology and computer-aided process planning. Introduction to manufacturing robotics.

412. *Computer Communications*

Winter. 3(3-0) CPS 300 or CPS 301; STT 351 or STT 441.

Computer networks; analysis by queueing theory; network design algorithms, routing and flow.

414. *Interactive Computer Graphics*

Summer. 3(3-0) CPS 312, matrix algebra.

Design of interactive graphics systems including display devices, processors, data structures, interrupt processing and graphical techniques. Two and three dimensional transformations, perspectives, hidden surface removal, shading. Graphics languages.

416. *Digital Design*

Fall, Spring, Summer. 3(3-0) CPS 311, CPS 322.

Combinational logic with MSI, LSI (medium-scale and large-scale integrated circuits) and microprocessors. Synchronous and asynchronous machines. Processor and control logic design.

417. *Digital Design Laboratory*

Fall, Winter, Summer. 2(1-3) CPS 416 or concurrently.

Designing, constructing and testing computer related circuits using discrete logic, MSI, LSI and microprocessors.

423. *Computer Architecture*

Fall, Winter, Spring. 3(3-0) CPS 416 or E E 430 or approval of department.

Computer arithmetic algorithms, memory systems, computer design, input-output system design, digital system simulation.

447. *Digital Filtering*

Spring. 3(3-0) CPS 300 or CPS 301, MTH 310.

Background. Sampling theorems. Discrete linear systems. The digital filter. Digital filter design. Discrete Fourier transforms. Applications and generalizations.

451. *Design of Language Processors I*

Fall. 3(3-0) CPS 313 or concurrently, CPS 322.

Relation between languages and automata. Properties of grammars. Lexical analysis and symbol-table management. Syntactic analysis using top-down parsing, precedence, LR(k) and LL(k). Preliminary design of a compiler.