

COMMUNITY MEDICINE C M

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.

511. Interpersonal Relationships in Health Care

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

Developing the communication and interpersonal skills needed in health care delivery. Emphasis on the doctor-patient relationship. Use of videotaped interactions among students, and between students and simulated patients.

512. Epidemiology and Biostatistics

Winter. 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

Spring. 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 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 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 516 field experiences and seminars.

590. Special Problems in Community Medicine

Fall, Winter, Spring, Summer. 1 to 8 credits. May re-enroll 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.

620. Directed Studies in Community Medicine

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

Individual projects on special problems related to community medicine.

COMPUTER SCIENCE CPS

College of Engineering

110. Introduction to Computer Programming

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

FORTTRAN programming, number systems and basic computer structure. Applications from various areas including business and social science.

120. Computer Programming for Engineers and Scientists

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

FORTTRAN 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) LBC 112 or concurrently. Interdepartmental with and administered by Lyman Briggs College.

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.

255. Computer Models in Science and Engineering

Spring. 3(3-0) 110 or 120 or equivalent FORTTRAN. Interdepartmental with and administered by the Department of Mechanical Engineering.

Problem-solving; development of student's ability to formulate computable models based on finite physical elements, examples from statics, dynamics, electrical resistance, and conduction heat transfer.

295. Independent Study

(290.) Fall, Winter, Spring, Summer. 1 credit. May re-enroll for a maximum of 4 credits in 295 and 495 combined. Approval of department.

Independent undergraduate research in computer science.

300. Computer Programming

Fall, Winter, Spring, Summer. 3(3-0) 110 or 120; MTH 108 or 111.

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

305. List Processing Languages

Winter. 3(3-0) 300 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) 110 or 120.

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

311. Assembly Language and Machine Organization

Fall, Winter. 4(3-1) 300, MTH 113 or concurrently, or approval of department.

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(3-1) 311, MTH 214 or concurrently or approval of department.

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(3-1) 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) 300, MTH 113.

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) 321, MTH 215 or 334.

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

341. Computer Aided Manufacturing

Spring. 4(3-2) 110 or 120. Interdepartmental with and administered by the Department of Mechanical Engineering.

Numerical control, Computer-Aided Numerical Control, Direct Numerical Control, and adaptive control applied in present day manufacturing. Use of the APT language to control NC machines.

**Descriptions — Computer Science
of
Courses**

411. Information Theory

Winter. 3(3-0) 110 or 120; 322 recommended; STT 351 or 441.

Measures of information content and flow. Channel capacity and theoretical limits on information transmission. Applications to coding and computer related studies.

414. Interactive Computer Graphics

Summer. 3(3-0) 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.

421. Combinational Circuits

Fall. 3(3-0) 311 and 321 or approval of department.

Combinational circuits. Minimization, multiple output, NAND-NOR implementation and iterative circuits.

422. Sequential Circuits

Winter. 3(3-0) 322 or approval of department, 421.

Synchronous and asynchronous machines. Boolean equations, state minimization, races and hazards. Regular expressions, Moore and Mealy models.

423. Computer Architecture

Spring. 3(3-0) 422.

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

447. Digital Filtering

Spring. 3(3-0) 300, 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) 313 or concurrently, 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.

452. Design of Language Processors II

Winter. 3(3-0) 451.

Continuation of 451. Semantics and generation of intermediate code. Pragmatics of code optimization, register allocation and machine code generation. Macro facilities, compiler generators and interpreters. Implementation of designed compiler.

453. Design of Language Processors III

Spring. 3(3-0) 452.

Continuation of 452. Readings from the current literature. Completion of compiler project.

490. Selected Topics

Fall, Winter, Spring, Summer. 3(3-0) May re-enroll for a maximum of 9 credits if a different topic is taken. Approval of department.

A new developing area of computer science selected by the department.

495. Independent Study

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

Independent undergraduate research in computer science.

801. Special Problems

Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 8 credits. Approval of department.

805. Clustering and Scaling Algorithms

Fall. 3(3-0) 300, STT 441 or approval of department.

Algorithms that organize large amounts of data. Includes metric clustering, hierarchical clustering and multi-dimensional scaling.

810. Introduction to Linear System Theory

(812.) Fall. 3(3-0) MTH 214. Interdepartmental with Systems Science and Social Science (College of) and administered by Systems Science.

A first course in system theory for students from a range of disciplines. Mathematical representation of system variables, transform and state space method of analysis, introduction to control theory, applications to physical, economic and social systems.

811. System Methodology and Simulation

Winter. 3(3-0) 810, STT 441. Interdepartmental with Systems Science and Social Science (College of) and administered by Systems Science.

Problem definition, design of abstract models for system design and control, simulation of systems described by differential and difference equations, generation of random variables, simulation of discrete object stochastic systems, simulation languages, applications to physical, economic and social systems.

813. System Project

Spring. 3(1-6) 811. Interdepartmental with Systems Science and Social Science (College of) and administered by Systems Science. Individual or team application of simulation methods to system design and/or management.

814. Advanced System Methodology and Simulation

Spring. 3(3-0) SYS 811. Interdepartmental with and administered by Systems Science.

Simulation of a class of time-varying distributed parameter processes; organization and design of large simulation models; optimization and parameter estimation in large simulation models; applications to economic, social and biological systems; other topics of current interest.

817. Nonparametric Pattern Recognition

Winter. 3(3-0) 300, STT 441, MTH 334.

Nonstatistical approach to pattern recognition. Discriminant functions, optimization techniques, feature extraction, non-parametric learning and algorithms for recognition. Error analysis.

818. Parametric Pattern Recognition

Spring. 3(3-0) STT 442, MTH 334.

Decision-theoretic approach to pattern recognition using decision rules, parameter estimation, suboptimum strategies, optimum strategy without learning, learning and sequential recognition.

825. Theory of Combinational Circuits

Fall. 3(3-0) 423 or approval of department.

Switching algebra and related group and lattice theory; decomposition; the synthesis of multiple-output switching functions using multi-level combinational circuits.

826. Theory of Digital Machines

Winter. 3(3-0) 825.

Sequential machines; machine specification in terms of states and transitions; decomposition; state minimization and assignment.

827. Switching Theory

Spring. 3(3-0) 826.

Asynchronous and speed independent circuits; static and dynamic hazards; use of race conditions.

831. Theory of Formal Languages I

Fall. 3(3-0) 322 or approval of department.

Definition of formal languages; acceptors and grammars; regular, linear and context free languages; closure properties.

832. Theory of Formal Languages II

Winter. 3(3-0) 831.

Context sensitive languages; derivation restricted grammars; semantics of formal languages.

841. Artificial Intelligence and Adaptive Systems I

Winter of odd-numbered years. 4(4-0) 300, STT 441.

Foundations of heuristic methods; syntactic means-end analysis; semantic means-end analysis; adaptive systems.

842. Artificial Intelligence and Adaptive Systems II

Spring of odd-numbered years. 4(4-0)

841. Computer representation of information from natural languages; representation of two and three dimensional environments; theory of design of robots; future trends.

861. Structured Programming

Fall. 3(3-0) 322; 313 or concurrently.

Block structured languages, control structures and mathematical foundations of structured programming; program development by stepwise refinement; proving program correctness; extensive readings from the current literature.

862. Advanced Data Structures

Winter. 3(3-0) 313; 322 or concurrently.

Structured data types; recursive and structured data structures and semantics; hierarchical program structures; models for programming languages; extensive readings from the current literature.

863. Structured Multiprogramming Systems

Spring. 3(3-0) 313; 322 or concurrently.

Advanced software techniques for computer operating systems. Term project to design, implement and analyze an operating system using quality structured program construction.

- 876. Performance Measurement Techniques**
Fall. 3(3-0) 313, 322, STT 441.
Performance evaluations on computer systems, evaluation of the central processor. Systems analysis, simulation, programmed measurement, and instrumental measurement techniques. Case studies.
- 884. Large Data Base Theory**
Summer. 3(3-0) 313, 452, or approval of department.
Data base management constituent parts; data definition, data manipulation, data retrieval and report generation. Hierarchical, network and relational data base models. Schemas, sub-schemas and access methods. Analytic and theoretical treatment.
- 899. Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of department.
- 911. General Automata Theory I**
Fall of odd-numbered years. 3(3-0) 423 or SYS 827 or approval of department. Interdepartmental with Electrical Engineering. Characterization of machines and programs as automata; mathematical decomposition of finite automata.
- 912. General Automata Theory II**
Winter of even-numbered years. 3(3-0) 911. Interdepartmental with Electrical Engineering.
Reliability and redundancy of finite automata. Probabilistic sequential machines. Languages definable by probabilistic and deterministic automata. Axioms for equivalence of regular expressions.
- 913. General Automata Theory III**
Spring of even-numbered years. 3(3-0) 912. Interdepartmental with Electrical Engineering.
Degrees of difficulty of computation. Models of parallel computation. Iterative automata.
- 944. Theory of Algorithms**
Summer. 3(3-0) 832 or 912.
Formulation of computation concept and algorithm verification. Topics included are finite and infinite acceptors, recursive functions, program verification, decision problems, flowchart schemas, and fixpoint theory of programs.
- 999. Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

CRIMINAL JUSTICE C J
College of Social Science

- 110. Introduction to Criminal Justice**
Fall, Winter, Spring. 3(3-0)
Survey of agencies that compose the system: primarily the police, courts and corrections. Also, the processes of these components and their relationships, as well as related agencies involved are examined.

- 235. Criminology**
Winter, Spring. 4(4-0) SOC 241 or C J 110 or approval of school. Interdepartmental and jointly administered with the Department of Sociology.
Crime analysed from sociological perspective: meaning of "crime", crime statistics, and measurement, theories of crime causation, crime typologies, e.g., professional organized, violent, sex, white-collar crimes, juvenile delinquency.
- 315. Criminal Investigation**
(395.) Winter, Spring. 4(4-0) 375.
Theory of investigation, crime scene conduct, collection and preservation of physical evidence and methods used in scientific interpretation of evidence.
- 318. Community Relations in Criminal Justice**
Fall, Winter, Spring. 4(4-0) 235.
Interdisciplinary survey of community relations in police and other criminal justice processes; theory and case studies. Emphasizes problem solving, conflict management, and community action in the prevention of civic disorder.
- 330. Organizational Theory in Criminal Justice**
Fall, Winter. 4(4-0) 110, 235.
A historic and a comparative overview of the principles of organization used by criminal justice agencies. Current theories and research on organization, with focus on the needs of the criminal justice process.
- 335. Police Process**
Fall, Winter, Spring. 4(4-0) 235.
Functional role of law enforcement within the criminal justice system. Law enforcement organizations and the function of operational units. Role of law enforcement in a democracy; service, crime deterrence, discretion, enforcement policies and evaluation of effectiveness.
- 355. Juvenile Justice Process**
Fall, Winter, Spring. 4(4-0) 235.
Prevalent interdisciplinary issues, ideas, principles and assumptions pertaining to delinquency phenomena; an overview of variables related to delinquency, duties, and responsibilities.
- 365. Corrections Process**
(368.) Fall, Winter, Spring. 4(4-0) 235.
The correctional modes applied to juvenile and adult offenders. Theoretical approaches to changing and controlling criminal behavior and practical limitations. Impact of methods on past correctional behavior.
- 375. Criminal Law Process**
Fall, Winter, Spring. 5(5-0) 235.
Administration of criminal justice: investigation, detection, arrest, search, seizure, charging, adjudication, sentencing, probation, corrections, parole. Constitutional safeguards and legal controls on official action emphasized.
- 392. Criminal Justice Research and Innovation**
Fall, Winter, Spring. 5(4-1) 110 and 235.
The utilization of research in planned change. Problems in conducting and interpreting research concerned with decision-making. The limitations of research and selected alternative strategies in bringing about change.
- 400H. Honors Study**
Fall, Winter, Spring, Summer. 1 to 3 credits. May re-enroll for a maximum of 6 credits. Seniors or approval of instructor.
Individually selected programs of supervised group or individual study dealing with some phase of the criminal justice system.

- 401. Independent Study**
Fall, Winter, Spring, Summer. 1 to 3 credits. May re-enroll for a maximum of 6 credits. 318, 335, 355, 365, 375, 392 or approval of instructor.
Individual study of the various fields of emphasis in criminal justice, under direct supervision of appropriate faculty member.
- 409. Issues in Criminal Justice**
Fall, Winter, Spring, Summer. 3 or 4 credits. May re-enroll for a maximum of 15 credits when different topics are taken. 318, 335, 355, 365, 375, 392.
Forum for course offerings on special issues in criminal justice, by visiting instructors or regular faculty.
- 429K. Fundamentals of Traffic Law**
Fall, Summer. 3(3-0) Interdepartmental with and administered by the College of Education.
Nature, function and application of traffic law as it applies to the safe and efficient movement of people and goods in a broadly conceived traffic accident prevention program.
- 433. Alcohol and Drugs: A Social Dilemma**
(425.) Winter. 3(3-0) Seniors or approval of school. Interdepartmental with the College of Education.
An overview investigation of the substance abuse phenomena with emphasis on alcohol. Sociological, psychological and medical aspects are discussed with implication for prevention, treatment and rehabilitation.
- 435. Analysis of Police Operations**
Winter, Spring. 4(4-0) 318, 335, 355, 365, 375, 392 or approval of school.
Organization and administration of line and staff functions of police units. Interrelationships of components. Analysis of total operations of the police, including personnel, budgeting, manpower allocation, enforcement policies and specialization.
- 440. Introduction to Highway Traffic Administration**
Fall. 4(4-0) Approval of instructor.
Systems approach to highway traffic administration emphasizing the interrelationships among agencies having management responsibilities and their accident prevention and loss reduction countermeasures to combat system failures. Future needs and alternatives.
- 441. Police and Court Traffic Administration**
Spring. 4(4-0) Approval of instructor.
Police and court traffic functions relative to other police and court functions in the criminal justice system. Systems approach to managing traffic accident prevention programs. Weaknesses, future needs and alternatives.
- 455. Analysis of Delinquency Programs**
Winter, Spring. 4(4-0) 318, 335, 355, 365, 375, 392 or approval of school.
Complexity of delinquency phenomena; evolution of programs and organizations which prevent, evaluate and treat specific youth problems.
- 465. Analysis of Correctional Operations**
Fall, Winter, Spring. 4(4-0) 318, 335, 355, 365, 392 or approval of school.
A critical analysis of existing institutions and community corrections programs; administrative methods of program implementation and evaluation. Prevalent correctional operational policies. Problems of effecting change.