350R. *Signs and Sign-Behavior II*

Fall, Winter, Spring, Summer. 1 credit. Majors. 350 concurrently.

In-depth consideration of signs and sign behavior.

351. *Message Analysis*

(440.) Winter. 4(4-0) 350.

Methods of describing messages and message codes, with emphasis on the concept of information.

352. *Non-Verbal Communication*

(320.) Spring. 4(4-0) 350.

Continuation of 351, with emphasis on nonverbal codes: gesture, expression, time and space, light.

360. *Critical Perspectives on Communication*

Fall, Winter, Spring. 4(3-0) 100.

Interdependence of communication and other societal factors, emphasizing criteria for ethical and social appropriateness.

399. *Seminar*

(400.) Fall, Winter, Spring, Summer. 4(4-0) Majors only. 360.

Contemporary issues in communication.

405. *Research in Communication Strategies and Styles*

Fall, Spring, Summer. 5(5-0) Seniors. 300.

Research literature in communication strategies and styles.

413. *Seminar in Communication Education*

Fall, Winter, Spring, Summer. 4(4-0) ED 436.

Philosophies of curricular and co-curricular programs in communication education. Internship experience in those programs.

420. *Message Design*

Winter. 4(4-0) 101.

Principles and practice in message-media construction and selection.

499. *Special Projects*

Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 15 credits. Approval of project proposal by department.

Independent research, group research, student-directed group projects.

805. *Communication Research*

Fall. 5(4-2) Majors.

Communication research strategy and methodology. Scientific process, bases for derivation and verification of hypotheses, and basic methods of designing research in communication.

806. *Communication Research*

Winter. 5(4-0) 805.

Continuation of 805.

815. *Organizational Communication*

Winter, Spring. 4(4-0)

Structure and function of communication in organizations, with emphasis on concepts and principles needed for effective management of organizational communication processes.

820. *Communication Theory and Process*

Fall, Summer. 3(3-0)

Theoretic models of communication, with emphasis on the applications of communication theory to various professional communication areas.

821. *Behavioral Research in Mass Communication*

(921.) Fall, Spring. 4(4-0)

Current behavioral science theories and research, e.g., media institutions, decision-making, mass media exposure patterns, diffusion of news and influence, effective message strategies, political communication, and mass media in socialization.

822. *Interpersonal Communication*

(920.) Winter, Summer. 4(3-0)

Current theories and research in interpersonal communication with emphasis on persuasion. The role of interpersonal communication in such processes as conflict resolution and information exchange will be considered.

828. *Cross-Cultural Communication*

(428.) Winter, Spring, Summer. 4(4-0)

Role of communication in the economic, social and political development of less developed countries. Problems in communicating across cultural boundaries.

830. *Nonverbal Communication*

Fall. 4(4-0)

A review of theory and empirical research on nonverbal communication with implications for application.

850. *Seminar in Research Utilization*

(950.) Winter, Summer. 4(3-0) May re-enroll for a maximum of 8 credits. Approval of department.

Applications of communication research to professional practice in such areas as teaching, change agencies, information system management, etc.

870. *Communication and Change: The Diffusion of Ideas and Information*

(470.) Fall, Spring. 4(4-0)

Research traditions underlying the diffusion of ideas and information, and acceptance of innovation and change. Strategic principles for introduction of change through the use of communication.

890. *Special Problems*

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

Special problems as arranged with instructor.

899. *Research*

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

905. *Communication Research Design*

Fall, Winter, Spring. 4(4-0) May re-enroll for a maximum of 12 credits. 806.

Methods of data collection and analysis in communication research. Designing exploratory studies of the communication process. Interviewer training and bias. Content analysis of the mass media. Writing and critiquing research reports.

940. *Seminar in Communication Theory and Research*

Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 45 credits. Approval of department.

Theoretic and research issues in communication.

990. *Special Problems*

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

COMMUNICATION ARTS CAC (COLLEGE OF)

999. *Research*

(COM 999) Fall, Winter, Spring, Summer. Variable credit. Approval of department.

COMMUNITY MEDICINE* C M

College of Osteopathic Medicine

510. *Health Behavioral Science I*

Fall. 2(1-3)

Relationship of the basic concepts of the social behavioral and behavioral sciences that influence health and medical care. Consideration is given to the impact of social and cultural factors on health behavior.

511. *Health Behavioral Science II*

Winter. 2(1-3) 510 or approval of department.

Continuation of 510. The mental health issues of today in relation to the dynamics of change and resistance. Concepts of personality development, equilibrium, reaction to stress, reaction to authority, and dependency Communication and patient education; the art of communication and interviewing; physician-patient relationships; integration of patient education with medical care services.

512. *Health Behavioral Science III*

Spring. 2(1-3) 511 or approval of department.

The diagnosis and treatment of various forms of deviant behavior, i.e. alcoholism, neuroses, character disorders, sexual deviations, schizophrenia, affective psychoses, organic and psychosomatic conditions, and mental subnormality. Preceptorship in community mental health.

513. *Health Behavioral Science IV*

Summer. 2(1-3) 512 or approval of department.

Community-based health surveys. Continuation of preceptorship in community mental health.

514. *Health, Medical Care, and Society I*

Fall. 2(1-3) 510, 511, 512, 513 or approval of department.

A historical review of medical care programs in the United States. Introduction to health care organization and delivery; health care facilities and financing of medical care; comparative health care systems. Manpower development and utilization; politics of health care; elements of community health planning. Practica on health care agencies and programs.

515. *Health, Medical Care, and Society II*

Winter. 2(1-3) 514 or approval of department.

Continuation of 514. Medical economics and finance for the general practitioner. Principles of medical management. Field placements with health care agencies and programs.

516. *Health, Medical Care, and Society III*

Spring. 2(1-3) 515 or approval of department.

Clerkship in community medicine. Consideration is also given to patient care issues. Practical problems of health care delivery are analyzed which occur in clerkship. Some issues are explored directly with the principal parties involved.

*Established July 1, 1972.

517. *Health, Medical Care, and Society IV*

Summer. 2(1-3)

Community-based studies of health care delivery systems.

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.

FORTRAN 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.

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

255. *Computer Models in Science and Engineering*

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

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.

290. *Special Problems*

Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 9 credits. Approval of department.

Independent undergraduate research in computer science.

300. *Computer Programming*

Fall, Winter, Spring, Summer. 3(2-1) 110 or 120; MTH 108 or 111.

Development and implementation of numeric and non-numeric algorithms using FORTRAN. 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*

(301.) Fall, Winter. 4(3-1) 300.

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*

(302.) Winter, Spring. 4(3-1) 311.

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

313. *Introduction to System Programming*

(303.) 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 multiprogramming.

321. *Introduction to Discrete Structures*

Fall, Winter. 3(3-0) 300, MTH 113.

Set operations, relations and functions. Deductive and mathematical proofs. Algebraic systems. Applications to computer science.

322. *Introduction to Theory of Computing*

Winter, Spring. 3(3-0) 321.

Finite-state machines, Turing machines. Effective procedures and algorithms. Symbol manipulation systems.

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.

421. *Combinational Circuits*

Fall. 3(3-0) 300, 321; 322 desirable; MTH 215.

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

422. *Sequential Circuits*

Winter. 3(3-0) 311, 421.

Synchronous and asynchronous machines. State minimization, flip-flops, Boolean equations, races and hazards.

423. *Computer Architecture*

Spring. 3(3-0) 422.

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

451. *Mechanical Language I*

Fall. 3(3-0) 311; MTH 215; 321 or PHL 337 and MTH 324; 322 recommended.

Classification of grammars and their properties. BNF, trees, relations, top-down parsing. Simple precedence grammars using matrix techniques.

452. *Mechanical Language II*

Winter. 3(3-0) 451.

Floyd-Evans productions. Assignment of a two-term project on compiler writing. Lexical analysis, semantics, register allocation, code of optimization. Hashing and other searching techniques. Dynamic storage techniques.

453. *Mechanical Language III*

Spring. 3(3-0) 452.

Finite state automata; pushdown automata. Extended precedence grammars. Precedence functions. LR(K) grammars; LL(K) grammars. Bounded context techniques.

490. *Special Problems*

Fall, Winter, Spring, Summer. 1 to 5 credits. May re-enroll for a maximum of 9 credits. Advanced standing and approval of instructor.

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.

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.

817. *Parametric Pattern Recognition*

Winter. 3(3-0) STT 441, computer programming.

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

818. *Nonparametric Pattern Recognition*

Spring. 3(3-0) 817.

The non-statistical approach to pattern recognition. Discriminant functions, clustering, nonparametric learning, and algorithms for 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.