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Department of Anthropology

(716) 395-2682

Acting Chairperson and Associate Professor: Charles R. Edwards, PhD, SUNY Buffalo; Professors: Margaret B. Blackman, PhD, Ohio State University; Jack R. Rollwagen, PhD, University of Oregon; Associate Professors: LouAnn Wurst, PhD, Binghamton University.

While the Department of Anthropology does not have a graduate degree program, its graduate course offerings may be applied as requirements and/or electives in degree programs as determined through the advisement process.

Anthropology Courses

ANT 501 Native-American Art and Culture. Prerequisite: ANT 100 or ARH 201 or instructor's permission. Provides a survey of Native-American visual arts (north of Mexico) viewed within the context of Native-American cultures and through the framework of anthropology. Considers Native-American arts by culture area: their roots, traditional expressions, changes with European contact, and contemporary expressions. Relies heavily upon the use of audiovisual material. 3 Cr. Spring.

ANT 503 Biography and Life History (A). Prerequisite: ANT 100 or other cultural anthropology course or instructor's permission. Studies the expression of life stories, their collection and recording, and their presentation in written format. Includes the evolution of the life history in anthropology and oral history; genres of life history; gender and life stories; the life history as an expression of the self vs. the life history as a window on culture; and the limitations of life history research. 3 Cr. TBA.

ANT 505 Applied Anthropology. Prerequisite: ANT 100, 300 or 321. Examines applied anthropology as the subfield of anthropology that uses anthropological perspectives to analyze and provide solutions for societal problems in the U.S. and globally. Using case studies and hands-on projects, explores the theoretical, practical and ethical implications of applied anthropology. Primarily for students who will ultimately need to address a variety of applied problems in multicultural or nonwestern settings. 3 Cr.

ANT 541 Archaeological Analysis. Prerequisite: ANT 110 or 442, or instructor's permission. Involves analysis of artifacts recently excavated from an archaeological site in Western New York. Examines theoretical aspects of contemporary laboratory methods in archaeology. 3 Cr. Spring.

ANT 590 Topics in Anthropology. An advanced course addressing current topics, issues, controversies, etc. of anthropological significance. Specific topics vary from semester to semester and may address issues in physical anthropology, archaeology, cultural anthropology, or applied/developmental anthropology. Descriptions of specific topics courses offered in any particular semester may be obtained through the department. May be taken more than once for credit if topics differ. 3 Cr.

ANT 599 Independent Study in Anthropology. Established in consultation between student and instructor. 1–6 Cr. Upon Special Arrangement.

ANT 699 Independent Study in Anthropology. Established in consultation between student and instructor. 1–6 Cr. Upon Special Arrangement.

ANT 642 Field Methods in Archaeology (A). Studies the principal methods and theories of contemporary archaeology. Involves survey and excavation of an archaeological site, expose and document prehistoric artifacts, and use of their distribution to interpret patterns in human behavior and cultural adaptation. 6 Cr. Summer Session.

Board of Study for the Teaching of Science and Mathematics

(716) 395-5576

Chairman: Richard V. Mancuso, PhD, SUNY Buffalo. Members: Betsy C. Balzano, PhD, Florida State University; Walter F. Brautigan, PhD, Cornell University; Charles Kiehl, EdD, SUNY Buffalo; Kenneth D. Schlecht, PhD, University of Iowa.

The Board of Study was created in natural and mathematical sciences to work for the improvement of science and mathematics teaching. Its intent is to supplement departmental efforts and to carry out functions and programs not within the interest of a single department or appropriately administered through one department.
Graduate-level subject-matter courses emphasizing the fundamental principles of the sciences and mathematics are scheduled by the Board of Study. Advisement services and courses specifically designed for teachers at the elementary and secondary school levels are available on a regular basis. Acceptability of natural science courses toward a graduate degree is determined in consultation with the student's major advisor.

NAS 586 Lab Science Safety. Prerequisite: Instructor's permission. Covers safe lab teaching practices for science teachers with no prior safety instruction. Emphasizes hazard potential in biology, chemistry, earth science/geology, and physics, especially when working with chemicals. Includes three hours of lecture/lab per week. 3 Cr.

NAS 599 Independent Study in the Natural Sciences. Arranged in consultation with the instructor sponsor prior to registration. 1–6 Cr.

NAS 611 Science for Elementary Teachers. Designed for elementary teachers with little formal science background. Investigates selected major concepts through the lab approach using simple, easily obtainable materials that can be used by teachers in the classroom. 3 Cr.

NAS 663 Field Natural History. Studies the principles of ecology and conservation in actual field locations. Uses taxonomy and field recognition of common species to develop an understanding of natural relationships. Requires students to develop individual projects related to their interests. 3 Cr.

NAS 673 Physics for Teachers I. Covers selected topics in kinematics and mechanics. Gives considerable attention to student participation in planning and performing experiments and demonstrations. Eighty hours of workshop. 4 Cr. Summer.

NAS 678 Astronomy for Teachers. Studies the solar system, interrelationships of its members, and its place in the cosmos; of the sun as a star; and of theories of the origin and evolution of stars, systems, and of the universe. Stresses the evaluation of evidence; and through lab, field, and planetarium work, emphasizes familiarity with the sky. Requires a project. 4 Cr. Summer.

NAS 683 Physics for Teachers II. Covers selected topics in optics and electromagnetism. Gives considerable attention to student participation in planning and performing experiments and demonstrations. Eighty hours of workshop. 4 Cr. Summer.

NAS 693 Physics for Teachers III. Covers selected topics in modern physics. Gives considerable attention to student participation in planning and performing experiments and demonstrations. Eighty hours of workshop. 4 Cr. Summer.

NAS 695 Chemical Lecture Demonstrations. Prerequisite: 12–15 credits in chemistry. Helps teachers use, develop, and practice chemistry lecture demonstrations. Participants obtain detailed instructions and practice several demonstrations and present them to their classmates. 1 Cr.

NAS 698 Research for Teachers. Enables students to participate in research projects in the natural sciences. May consist of construction of electronic and/or mechanical devices, computations, data collection and analysis and interpretation of results. 1–6 Cr.

Department of Computer Science

(716) 395-2194

Chairperson and Professor: Kadathur B. Lakshmanan, PhD, Ohio State University. Professors: Kulathur S. Rajasethupathy, PhD, Tata Institute, Bombay, India; Thambrahalli M. Rao, PhD, Indian Institute of Science, Bangalore, India. Assistant Professors: Joan M. Lucas, PhD, Princeton University; Sandeep Mitra, PhD, SUNY Binghamton; Anthony Scime DA, George Mason University.

Computer science is the study of theory and practice of computation. It incorporates aspects of several other fields: mathematics, to analyze the properties of algorithms and data structures; engineering, to design and construct practical programs and machines; the experimental sciences, both to investigate the behavior of programs running on real machines and to use programs for modeling scientific phenomena; and the cognitive sciences, to develop “intelligent” programs and to study computation in relation to human intelligence.

Computer science is a young and rapidly developing field. Its chief areas of specialization, reflected in regular course offerings at SUNY Brockport, are: programming methodology; design
and analysis of algorithms, software engineering, and programming languages; database systems; graphics; computer architecture; systems programming; modeling and simulation; artificial intelligence; and networking. Other areas are covered in independent-study and topics courses. Although the department does not offer a graduate degree program, a variety of courses are offered at the graduate level.

**Computer Science MS—Agreement with SUNY Binghamton**

The Department of Computer Science at SUNY Brockport, under an agreement with SUNY Binghamton, offers master's-level courses in computer science that can be counted towards fulfilling the requirement for an MS in Computer Science from SUNY Binghamton. This agreement between the two public institutions of higher learning provides an opportunity to the residents of the greater Rochester area to pursue their interests in graduate education at minimal cost. Details about admission and course requirements are briefly summarized below. For more information contact:

Dr. Kadathur B. Lakshmanan, Chair  
Department of Computer Science  
SUNY Brockport  
Tel: (716) 395-2194  
e-mail: kraja@brockport.edu

Dr. Kanad Ghose, Chair  
Department of Computer Science  
SUNY Binghamton  
Tel: (607) 777-4803  
e-mail: ghose@cs.binghamton.edu

Information on the program is also available at [www.cs.brockport.edu](http://www.cs.brockport.edu).

Following are the salient features of the program agreement:

1. Prospective students will have to apply to and satisfy the admissions requirements of SUNY Binghamton. Applicants will have to indicate on their application that they are candidates under the MS program agreement with SUNY Brockport.

2. Up to four courses can be taken at SUNY Brockport. These will be taught by the computer science faculty at SUNY Brockport. Courses taken at Brockport will be automatically accepted for transfer credit at SUNY Binghamton as long as students maintain a “B” average in those courses.

3. Students entering the program will have the choice of pursuing either the thesis or the non-thesis option. The course requirements for each of the options are:

   **Non-thesis option:**
   a. Three required courses,
   b. Seven elective courses selected with the approval of the student’s faculty advisor, and
   c. Passing a comprehensive examination.

   **Thesis option:**
   a. Three required courses,
   b. Five courses selected with the approval of the student’s faculty advisor, and
   c. A written and defended thesis.

4. Additional courses may be taken at SUNY Brockport through EngiNet, a distance-learning facility that connects Brockport and SUNY Binghamton.

5. Depending on student enrollment, the Department of Computer Science at SUNY Brockport may offer additional courses during summer, with the potential of increasing the number of courses that can be taken at SUNY Brockport to more than six.

6. Students choosing the thesis option will be allowed to pursue their thesis work with SUNY Brockport faculty. This is equivalent to two additional courses.

7. The degree will be conferred by SUNY Binghamton.
Course Requirements

1. Complete at least one course in each of the following core areas.
      CS-552: Operating Systems
   b. Programming Languages and Software Design *CS-571: Programming Languages
      CS 572: Computer Construction
   c. Theoretical Computer Science *CS-573: Automata Theory and Formal Languages
      CS-575: Design and Analysis of Computer Algorithms

   *Course numbers used are from the SUNY Binghamton catalog.

2. Complete one of the following options:
   a. Seven courses approved by the student’s faculty advisor, and passing a comprehensive examination or
   b. Five courses approved by the student’s faculty advisor; and written and defended a thesis.

Admissions Policies and Requirements

For admissions policies and requirements of SUNY Binghamton, please contact its Graduate Admissions Office at (607) 777-2151.

CSC 501 Theory of Programming Languages. Prerequisite: CSC 311. Covers programming language concepts, description, design, and evaluation. Includes these topics: language families and history; design principles; BNF and other syntax notations; compilation vs. interpretation; implementation concepts; comparison of features and conventions of various languages, including: data types, structures, declaration, abstraction, binding, scope, conversion, and protection; computational primitives; control structures; sub-programs; I/O; exceptions; concurrency; preprocessors; and programming environments. Requires extensive programming. 3 Cr. Every Semester.

CSC 506 Algorithms and Data Structures. Prerequisites: CSC 205 and MTH 481. Covers the design and analysis of data structures and associated algorithms. Includes these topics: arrays, strings, stacks, linear and generalized lists, multilists, multitings, queues, sets, hashing, trees, graphs, recursion, searching and sorting, and applications such as text processing, polynomials, sparse matrices, storage management, and unlimited-precision arithmetic. Requires extensive programming. 4 Cr. Every Semester.

CSC 511 Computer Architecture. Prerequisites: CSC 303 and 311. Covers the design and organization of digital computers. Includes these topics: digital logic and circuit design, data representation, registers, memories and memory management, CPU and ALU architectures, instruction sets, busses and I/O systems, interrupt structure, and microprogramming. Also includes virtual machines, parallelism, pipelining and data flow machines. 3 Cr. Every Semester.

CSC 512 Operating Systems. Prerequisites: CSC 303 and 311. Recommended: CSC 319 or knowledge of C and UNIX. Covers basic principles of operating systems. Includes these topics: file systems, CPU scheduling and context switching, memory management and virtual memory, disk scheduling, deadlock, concurrent processes and programming, protection mechanisms, design principles, and attempts at standardization. Also includes an in-depth study of the UNIX operating system. Requires extensive programming. 3 Cr. Spring.

CSC 519 Computer Networks. Prerequisites: CSC 303, 311 and 319. Offers a comprehensive study of the field of computer communications, with emphasis on theoretical aspects of local area networks. Compares specific LANs. Includes these topics: the ISO model, protocols, topologies, error detection and correction, routing, packet switching, virtual circuits, and datagrams. 3 Cr. Fall.

CSC 522 Relational Database Design. Prerequisite: CSC 205. Examines the theory and practice of the relational approach to database design. Includes these topics: DBMS vs. a traditional file processing; relational algebra; normalization; lossless and/or dependency preserving decomposition; query languages such as SQL; query optimization; integrity and security; and database project design. 3 Cr. Fall.

CSC 527 Software Engineering. Prerequisites: CSC 311 and instructor’s permission. Introduces software engineering and programming-in-the-large. Includes these topics: life cycle models, development standards, project organization, requirements engineering, configuration management, quality assurance, cost and manpower estimates, specification techniques, design methods and representations, human factors,
structured programming, object-oriented programming, testing and integration, validation, maintenance, and documentation. Allows students to work as a project team in class developing a system for an actual customer. Requires communication and writing skills, and extensive programming. 3 Cr. Fall.

CSC 529 Object-Oriented Programming. Prerequisite: CSC 205. Introduces basic concepts in object-oriented programming (OOP) and how to apply OOP techniques using an appropriate OOP language such as Java or C++. Topics include: the OOP programming paradigm, including analysis and design, a survey of related languages, data hiding and encapsulation, inheritance, and polymorphism. Entails implementation of these concepts using appropriate programming language constructs. Requires extensive programming. Spring Semester.

CSC 532 Simulation. Prerequisites: CSC 203 and MTH 281. Covers computer modeling of complex systems with an emphasis on discrete stochastic models. Includes these topics: brief review of random variables, distributions and statistical tests, random number generation, mathematical model of a simple queue, simulation of discrete systems (with SIMSCRIPT), and continuous system simulation. 3 Cr. Fall.

CSC 533 Computer Graphics. Prerequisite: CSC 311. Provides a hands-on approach to computer graphics, emphasizing interactive 2D raster techniques. Includes these topics: graphics models, drawing primitives and clipping, color models, user interaction, 2D geometrical transformations, animation, curve and surface representations, introduction to 3D projections, solid modeling and rendering. Requires extensive programming. 3 Cr. Spring.

CSC 534 Artificial Intelligence. Prerequisite: CSC 205. Introduces artificial intelligence and its languages. Includes these topics: history and state of the art in AI; programming techniques in the languages LISP and PROLOG; fundamental methods in AI, including heuristic search; knowledge representation using predicate logic and production systems; and classic basic problems involving games, graphs, theorem proving, symbolic algebra, expert systems, natural language, etc. Requires extensive programming. 3 Cr. Fall.

CSC 537 Computer-Human Interface Design. Prerequisite: CSC 205. Provides a hands-on introduction to design and implementation of software for streamlined computer-human interaction, emphasizing graphical user interfaces. Includes these topics: theoretical models; design guidelines; implementation and evaluation methodologies; interaction paradigms, e.g., command-line, menus, hypertext, multimedia; case studies of graphical environments, e.g., Microsoft Windows, Macintosh, X-Windows; application areas, e.g., on-line help, data entry/editing, query processing, programming, instruction, process control, and communication. Requires extensive programming. 3 Cr. Spring.

CSC 544 Introduction to Parallel Computing. Prerequisites: MTH 481 and CSC 406. Deals with design and analysis of parallel algorithms. Includes these topics: parallel models of computation; measures of complexity; parallel algorithms for selection, searching, sorting, and merging; matrix algorithms; transitive closure; connected components; and shortest path, minimum spanning tree and routing algorithms. Provides hands-on experience in a parallel programming environment. 3 Cr. Spring.

CSC 583 Theory of Computation. Prerequisites: CSC 203 and MTH 481. Studies formal languages and theory of automata with an emphasis on Church's thesis, "algorithm equals machine." Includes these topics: regular expressions and context-free languages, finite and pushdown automata, Turing machines, computability, undecidability, and complexity of problems. 3 Cr. Spring.

CSC 595 Topics in Computer Science. Prerequisite: Instructor’s permission. An advanced course. Addresses current topics in the field. Each offering is motivated by the expertise of the instructor and students’ interests. Expects students to complete a major research, design, or development project. Descriptions and prerequisites are published prior to the registration period for the course. Past topics covered included: networking, human factors, computational linguistics, advanced architecture, software engineering, logic programming, program validation, object-oriented programming and parallel algorithms. 3 Cr.

CSC 599 Independent Study in Computer Science. Prerequisite: Instructor’s permission. Arranged in consultation with the instructor-sponsor prior to registration. 1–3 Cr.

CSC 601 Theory of Programming Language. Prerequisites: MTH 481, and CSC 401 and 406. Presents an advanced mathematical treatment of the underlying principles of programming languages and comparison of the issues as they relate to the main language paradigms: procedural, object oriented, declarative, functional and concurrent. Covers: lexical vs. syntactic vs. semantic structures of languages; objects and classes, inheritance, dynamic binding, and implementation issues; Lambda calculus and recursive functions; logic resolution and unification; and parallel
CSC 611 Advanced Computer Architecture. **Prerequisites:** Graduate standing and equivalent of MTH 346 and 481, and CSC 411. Advanced course in architecture of high-performance computer systems. Emphasizes quantitative analysis. Includes: measuring performance, cost trends, CISC versus RISC, pipelined processors, branch penalties and prediction, memory hierarchy, cache organization, virtual memory, parallel processors, SIMD/MIMD systems, interconnection networks, and distributed computing. 3 Cr.

CSC 683 Automata Theory and Formal Languages. **Prerequisite:** MTH 481. Provides an advanced treatment of the mathematical foundations of computer science, including the theories of automata, formal languages, computability and computational complexity. Includes some of the fundamental material regarding finite automata and context-free grammars as part of regularly accredited undergraduate programs, covering the material more quickly in this course. 3 Cr.

CIS 504 Multimedia Applications (A). **Prerequisites:** CIS 303 and 304. Studies multimedia systems and applications in business world. Includes: multimedia applications, hypertext and hypermedia, audio, graphics, images, and full-motion video; multimedia-ready personal computers and workstations, storage devices, operating systems and graphical user interfaces; communication and networking requirements, and multimedia applications on the Internet; file formats, data compression and streaming audio/video; and multimedia authoring tools. 3 Cr.

CIS 519 Computers Networks and Internet Applications (A). **Prerequisites:** CIS 304 (or BUS 317) and CSC 203. Studies data communication, computer networks, and Internet applications. Includes: Data communication; LAN and WAN applications; Internet and Intranet; e-mail; FTP and Web applications; distributed systems and standards; communication concepts, media, coding of data, and error control; LAN topologies and protocols; bridges, routers and gateways; TCP/IP; client server paradigm; network configuration; performance monitoring; and management, security, and reliability. 3 Cr.

CIS 522 Physical Design and Implementation of DBMS (A). **Prerequisite:** CIS 317 (or BUS 417). Covers information systems design and implementation within a database management system environment. Requires students to design and construct a physical system using database software to implement the logical design. Stresses basic knowledge of normalization of data, data modeling, database methods, database design, and the use of databases in business. 3 Cr. Spring.

CIS 527 Project Management and Practice (A). **Prerequisite:** CIS 317 (or BUS 417). Introduces software development and management of the development process. Includes: managing the software life cycle; requirements definition, logical design; physical design, implementation, testing, system integration, and maintenance; design techniques (structured, event-driven and object-oriented); implementation; testing and software quality assurance; delivery and user training; metrics for project management and system performance evaluation; management expectations; personnel management, cost analysis and change management; and management of behavioral and technical project aspects. Is placed in framework of client-server systems. 3 Cr. Spring.

CIS 595 Topics in Information Systems (A). **Prerequisite:** Published prior to registration each semester. An advanced course that addresses current topics in the field. Each offering of the course is motivated by the expertise of the instructor and by students’ interests. Expects students to complete a major research, design, or development project. Descriptions are published prior to the registration period. 3 Cr.

CIS 599 Independent Study in Information Systems (A). **Prerequisite:** Instructor’s permission. Arranged in consultation with the professor/sponsor prior to registration. 1–3 Cr.

**Developmental Disabilities Certificate Program**

(716) 395-2355

The purpose of the Developmental Disabilities Certificate Program is to provide education for persons planning to work or already working with children and adults who are developmentally disabled. It affords the opportunity for those who have already completed baccalaureate programs to broaden their knowledge and expertise in providing for the needs of this population. The certificate program can also be integrated with an existing master's program.

The curriculum consists of 18 credits of courses: nine credits of core courses, a three-credit internship, and six elective credits. To be eligible for the internship, students must have
completed a minimum of two core courses and one elective course or receive permission of the instructor. The internship consists of six hours at the internship site and one hour of classroom time per week.

Courses are offered at a variety of sites and times suited to adult learners. Sites include SUNY Brockport, the SUNY Brockport MetroCenter, Finger Lakes Developmental Disabilities Service Office, Lifetime Assistance, Inc., and Continuing Developmental Services, Inc.

**Core Courses**

**PRO 550 Developmental Disabilities: A Lifespan Perspective (A).** Examines the human lifespan on an age continuum with an emphasis on developmental disabilities. Explores theories of development during nine stages of the human lifespan, each stage covering social, psychological, physiological, and spiritual development of both normal development and that of people with developmental disabilities. 3 Cr.

**EDC 518 Conferencing Skills (A).** Explores the knowledge and skills related to conferencing with consumers, families, and others. Includes communication models with an emphasis on applying the knowledge to conferencing skills. Entails demonstrations, simulations, and role-playing activities. 3 Cr.

**SWO 578 Developmental Disabilities.** Examines and analyzes developmental disabilities in individual, family and group practice experience; and policy and planning in the development, coordination, and impact on delivery systems. 3 Cr.

**Internship**

**PRO 500 Developmental Disabilities Internship (B).** Affords students the opportunity to apply the knowledge gained in core and elective courses in a setting which serves individuals with developmental disabilities. Coordinates experiences with student’s educational objectives and career goals. 3 Cr.

**Electives**

Courses which are consonant with the student’s educational and professional goals may be chosen in consultation with the student’s advisor.

**Department of the Earth Sciences**

(716) 395-2636, (716) 395-2416 fax

*Chairperson and Associate Professor:* Jose A. Maliekal, PhD, University of Hawaii; *Associate Professors:* Judy A. Massare, PhD, The Johns Hopkins University; Robert Weinbeck, PhD, Iowa State University. *Assistant Professors:* Whitney J. Autin, PhD, Louisiana State University; Mark R. Noll, PhD, University of Delaware; Scott M. Rochette, PhD, St. Louis University; James A. Zollweg, PhD, Cornell University.

*Website:* [www.weather.brockport.edu](http://www.weather.brockport.edu)

*E-mail:* earthsci@weather.brockport.edu

While the Department of the Earth Sciences does not have a graduate degree program, its graduate course offerings may be applied as requirements and/or electives in degree programs as determined through the advisement process.

**Earth Sciences Courses**

**ESC 511 Hydrology Lab (A).** *Prerequisite or corequisite: ESC 512.* Examines measurement of water in streams, stream basins, and other parts of the water cycle, firsthand in the field and laboratory. Provides understanding of the use of hydrologic equipment, measurement techniques and analytical skills through investigation and field trips to evaluate stream discharge, dams and reservoirs, evapotranspiration, snow survey, water quality, and sediment yield. 1 Cr. Fall.

**ESC 512 Hydrology.** *Prerequisite: ESC 350, MTH 201 or instructor’s permission.* Explores the water cycle, including precipitation, runoff, streams and lakes, groundwater, snow and other hydrologic topics. Covers water storage and processes, analytical skills dealing with hydrologic events, and the utilization and conservation of water resources in terms of its distribution, quality and flow. 3 Cr. Fall.
ESC 515 Physical Meteorology. Prerequisites: ESC 311 and 350, MTH 201 and PHS 201. Covers atmospheric thermodynamics; physical processes of condensation and radiation; electrical, optical, and acoustical phenomena in the atmosphere; uses of weather radar and meteorological satellites; and methods of probing the atmosphere. 3 Cr. Alternate Fall.

ESC 516 Thermodynamics and the Boundary Layer. Prerequisites: ESC 311 and 350, MTH 201 and PHS 201. Investigates thermodynamic processes and stability in the lower atmospheric layers; transfers of mass, energy and momentum in the boundary layer; and atmospheric dispersion and modeling. 3 Cr. Alternate Fall.

ESC 517 Dynamic Meteorology. Prerequisites: ESC 312 and 350, PHS 201, and MTH 203 or 455 or PHS 301. Covers development of the governing equations of motion, and simplifications, introduction of concepts of divergence, circulation, vorticity; mid-latitude synoptic scale introduction of concepts of divergence, circulation, vorticity; mid-latitude synoptic scale processes and stability in the lower atmospheric layers; transfers of mass, energy and momentum in the boundary layer; and atmospheric dispersion and modeling. 3 Cr. Alternate Fall.

ESC 518 Watershed Sciences. Prerequisites: ESC 350 and 412 or GEL 462 or instructor’s permission. Explores the art and science of evaluating water, air and land resources in a watershed to provide scientific information for management policy decisions. Covers utilization of maps and other physical resources information, sampling, data processing, and analysis. 3 Cr. Fall.

ESC 519 Introduction to Geo Information Systems. Prerequisites: ESC 350, GEL 101 and CHM 205, or instructor's permission. Provides an introduction to the use of computer geographic information systems (GIS). Examines the geographic and information data-processing methods associated with Earth systems sciences studies. Includes topics such as geographic data selection, analysis and presentation using spatial data-processing hardware and software techniques. Uses Earth systems data to develop an individual hands-on study application. 3 Cr. Alternate Spring.

ESC 520 Atmospheric Sensing Methods. Prerequisites: ESC 311 and 350, MTH 201 and PHS 201. Examines theory of atmospheric sensing equipment: conventional environmental instrumentation, traditional radar propagation and interpretation, Doppler and profiler implementations, and satellite imagery interpretation. Emphasizes applications to National Weather Service networks and weather forecasting. 3 Cr. Alternate Spring.

ESC 521 Air Pollution Meteorology. Prerequisites: ESC 211 and 350. Studies the way the atmosphere transports and diffuses pollutants. Lays a groundwork through a study of fundamental meteorology, including stability, turbulence, wind and local circulations. Also studies diffusion through mathematical models of both point sources and area sources. 3 Cr. Alternate Spring.

ESC 522 Geotechniques of Hazardous Wastes Operations (A). Prerequisite: At least one field course in the earth sciences or equivalent. Covers principles and practices of field hydrogeology specializing in hazardous waste-site investigations, monitoring, and remediation including (1) OSHA 40-hour certified training; (2) emergency spill response; (3) personal protection equipment; (4) groundwater sampling design, equipment and procedures; (5) quality control and quality assurance programs; and (6) remediation techniques and equipment. 3 Cr.

ESC 523 Tropical Meteorology. Prerequisites: ESC 311 and 350, MTH 201 and PHS 201. Provides a comprehensive understanding of weather systems and climatic fluctuations of the tropics. Also covers the atmosphere-ocean interaction at various time scales and discusses the possible influence of the tropical tropospheric events on the weather and climate of the middle latitudes. 3 Cr. Alternate Spring.

ESC 524 Marine Geology—Bahamas. Prerequisite: ESC 200 or instructor’s permission. Entails studies of the geology and ecology of San Salvador Island, Bahamas. Topics to be investigated by advisement. Requires a written report. A two-week course off campus during winter intersession. 3 Cr. Winter.

ESC 599/699 Independent Study in Earth Science. Prerequisite: ESC 350. Defined in consultation with the instructor sponsor prior to registration. 1–3 Cr.
ESC 636 Water Resources Topics. Covers the study of selected topics in water dealing with its sensing, analysis, causes, impacts, and prediction. 3 Cr.

ESC 671 Selected Weather Topics. Covers the study of selected topics in weather, dealing with its sensing, analysis, causes, impacts, and prediction. 3 Cr. Fall.

ESC 672 Selected Oceanography Topics (A). Allows for study of selected topics in physical oceanography, dealing with its sensing, analysis, causes, impacts, and prediction. 3 Cr. Fall.

ESC 675 Real-time Weather Studies (A). Develops principles of meteorology from analysis of electronically delivered current environmental data and learning activities. Relies on computer receipt, analysis, and display of geoscience data with classroom applications. A distance-learning course. 3 Cr. Fall, Spring.

Geology Courses

GEL 508 Structural Geology (A). Prerequisites: ESC 350 and GEL 302. Covers the principles of mechanical behavior of rocks during deformation, theories of origin of major and minor rock structures (folds, faults, rock cleavage, etc.) and their relationships to each other. Also covers plate tectonics models for some major crustal structures. Emphasizes laboratory techniques of analyzing and solving three-dimensional problems gathering structural data in the field. Requires a weekend field trip and report. 4 Cr. Alternate Spring.

GEL 511 Stratigraphy and Sedimentology (A). Prerequisites: ESC 350 and GEL 302. Investigates physical, chemical and biological characteristics of sedimentary materials, sedimentary environments and geologic time. Allows for the application of stratigraphic principles to a variety of problems involving sedimentary rocks in the geologic record. Covers techniques and instruments used in stratigraphy and sedimentology. Requires advanced field or laboratory investigation. 4 Cr. Alternate Fall.

GEL 515 Geomorphology (A). Prerequisites: ESC 350 and GEL 101 or equivalent. Explores surface features of Earth and their origin. Emphasizes processes, both internal and external, which interact to produce land forms. Takes an analytical approach stressing formulation of valid inferences based on accurate observations. Requires a weekend field trip, and a term paper based on research of project involving landform recognition, description, and genetic analysis using maps and/or other imagery. Project topic is tailored to student’s specific professional interests. 3 Cr. Fall.

GEL 516 Landform Analysis Laboratory (A). Prerequisite or corequisite: GEL 515. Focuses on the recognition and interpretation of landforms in a variety of geologic and climatic settings. Uses topographic contour maps, air photos, radar and false color images of Earth’s surface obtained from air craft and satellites. Correlates landforms with occurrence of geologic materials. Illustrates applications of geologic principles to human problems. 1 Cr. Fall.

GEL 531 Petrology (A). Prerequisites: ESC 350 and GEL 312. Covers the study of processes by which igneous, sedimentary, and metamorphic rocks form and the principles of rock examination which reveal the operation of those processes. Explores the relationships of rock-forming processes to plate tectonics. Emphasizes recognition, description and interpretation of mineralogic and textural features in hand specimens. Requires a weekend field trip and a library research paper. 4 Cr. Alternate Spring.

GEL 556 Topics in Field Geology of the Northeast (A). Prerequisite: Instructor’s permission. Presents aspects of geology of selected regions of the northeastern U.S. from field observations. Techniques of gathering and recording geologic data in the field, interpretation of topographic and geologic maps, and identification/examination of rocks and structures in the field. Requires a two-week field trip with short field projects. Can be repeated for credit with instructor’s permission. 3 Cr.

GEL 557 Geochemistry (A). Prerequisites: ESC 350, GEL 101 and CHM 205 and 206. Applies basic chemical principles of thermodynamics, kinetics, and equilibrium to the investigation of common geologic problems ranging from the crystallization of silicate melts to surface reactions on soil minerals. Focuses on application of good laboratory practices to wet chemical and instrumental techniques involving geologic materials. 4 Cr. Alternate Fall.

GEL 562 Groundwater (A). Prerequisites: ESC 350 and GEL 101 or equivalent. Studies groundwater, its occurrence, movement and use, and its place in the hydrologic cycle. Examines the origin and analysis of aquifers, use and effects of wells, and water quality and groundwater problems. 4 Cr. Spring.

GEL 599/699 Independent Study in Geology. Prerequisite: GEL 302. Arranged in consultation with the instructor-sponsor prior to registration. 1–3 Cr.
Music

(716) 395-2478

The College offers graduate-level courses in music which may be applied as requirements and/or electives in degree programs as determined through advisement. The College also sponsors music events, Brockport College Community Chorus, Jazz Ensemble and Gospel Music.

Music Courses

MUS 513 American Music. Prerequisite: Instructor's permission. Explores musical styles and idioms of North America from colonial times to the present. Requires visual and aural analysis of structural and stylistic characteristics; and recognition of important composers and musicians. 3 Cr.

MUS 514 American Musical Theatre. Studies American musical theatre, including Broadway shows, by investigating and analyzing its form. Requires students to discuss, view and research selected works; and develop greater awareness in listening. 3 Cr.

MUS 526 Brockport Symphony Orchestra. Prerequisite: Audition. Requires students to perform a standard orchestral repertoire and develop orchestral techniques and an understanding of musical styles. 1 Cr. Every Semester.

MUS 585 American Folk Music. Prerequisite: Instructor's permission. Provides a performance approach to the history, styles and repertoire of North American folk music. Requires a research paper. 3 Cr.

MUS 587 Music and Child (A). Prerequisite: MUS 105 or instructor's permission. Covers methods and approaches in the use of music with children and for the total growth of children. Explores various vocal and instrumental materials suitable for children in creating original songs, rhythmic games, and sound stories. 3 Cr.

MUS 595 Special Topics in Music. Covers topics in music, including special explorations and advanced projects. The exact nature of the topic and instructional methodology are defined by the instructor. 3 Cr.

MUS 599 Independent Study in Music. Prerequisite: Instructor's permission. Defined in consultation with instructor prior to registration. 1–3 Cr.

Department of Philosophy

(716) 395-2420

Chairman and Professor: Georges Dicker, PhD, University of Wisconsin. Professors: Georges Dicker, PhD, University of Wisconsin; Joseph Gilbert, PhD, New York University; Harold Greenstein, PhD, New York University. Assistant Professor: Catherine McKeen, PhD, Rutgers University.

The Department of Philosophy offers graduate courses that may be applied as requirements and/or electives in degree programs as determined through the advisement process.

Philosophy Courses

PHL 528 Philosophy of Art (A). Critically examines competing answers to selected central questions in the philosophy of art using contemporary as well as historical writings. Includes these topics: the definition of art, the nature of artistic expression, validity in interpretation, what makes art representational, and the nature of creativity. 3 Cr.

PHL 591 Seminar on Individual Philosophers. Provides an in-depth study of the writings of one or two major philosophers, such as Descartes, Hume, Kant, Dewey, Sartre and Rawls. Content varies with appropriate subtitles provided. May be repeated as subtitle varies. 3 Cr.
Department of Political Science and International Studies

Chairperson and Professor: Stephen H. Ullman, PhD, University of Minnesota. Distinguished Teaching Professor Emeritus: W. Raymond Duncan, PhD, Fletcher School of Diplomacy. Associate Professors: Walter A. Borowiec, PhD, SUNY Buffalo. Assistant Professors: Mark Chadsey, PhD, SUNY Buffalo; John J. Fitzpatrick, PhD, SUNY Buffalo; Dena Levy, PhD, University of Iowa; Andrea Rubery, PhD, Georgetown University.

While the Department of Political Science and International Studies does not have a graduate degree program, its graduate political science and international studies course offerings may be applied as requirements and/or electives in degree programs as determined through the advisement process.

Political Science Courses

PLS 502 Legal Internship. Provides an experiential learning opportunity. Requires student interns to perform paraprofessional responsibilities in either a public or private law office. 6 Cr. Every Semester.

PLS 520 Civil Liberties, Civil Rights and the Constitution. Examines public policy and constitutional rights. Focuses on controversial constitutional issues such as affirmative action, capital punishment, abortion, and free press/fair trial conflict. Discusses issues in a seminar format. 3 Cr.

PLS 544 National Security. Covers recent changes in national security (military defense) policy perception, and planning and implementation as a result of technological advances. In particular, focuses on military defense policies, including strategies and tactics of the major powers; their principal allies and other powers of military consequence; and weapons proliferation, arms control, limitation, and reduction. 3 Cr.

PLS 545 International Law and Organization. Provides an introduction to modern public international law and to major international organizations such as the United Nations and associated bodies, as well as major regional organizations. 3 Cr.

PLS 548 Leadership. Draws upon recent scholarly studies and biographies to examine the essence of leadership in the modern age. Studies the uses of power that distinguish leaders from mere power holders. 3 Cr.

PLS 566 Environmental Politics. Investigates federal and New York state environmental policies, and the relationship between the two. Focuses first on federal environmental policy, then covers New York environmental policy. Includes topics selected from major environmental issues: air, water, land use, solid waste, hazardous waste, aesthetics and conservation, atomic energy, pesticides, and chemical waste. Requires two field trips. 3 Cr.

International Studies Courses

INS 548 Leadership. Cross-listed as PLS 548. Draws upon recent scholarly studies and biographies to examine the essence of leadership in the modern age. Studies the uses of power that distinguish leaders from mere power holders. 3 Cr.

INS 570 Nationalism (A). Cross-listed as PLS 570. Examines the post-World War II force of nationalism as a driving force in the international system, with special attention to the post-Cold War period. Includes the topics of ethnic nationalism and regional conflicts, multinational states and multistate nations. 3 Cr.

INS 575 Political Geography (A). Cross-listed as PLS 575. Covers key aspects of geopolitics as it affects foreign policy and international politics in the post-World War II period. Examines topics such as resources, environment and human geography as well as issues associated with the study of geography-politics relationships: gateway states, shatter belts, heartland concept, and trade ties. 3 Cr.

INS 599 Independent Study in Political Science. Arranged in consultation with the instructor-sponsor prior to registration. 1–6 Cr. Every Semester.
affects foreign policy and international politics in the post-World War II period. Examines topics such as resources, environment, and human geography as well as issues associated with the study of geography/politics relationships: gateway states, shatterbelts, heartland concept, and trade ties. 3 Cr.

**INS 599 Independent Studies in International Studies.** Permits students to pursue in greater depth topics studied previously in conventional graduate-level courses. Designed through consultation between student and instructor. 1–6 Cr. Every Semester.

**School of Professions**

**Interdisciplinary Courses**
The School of Professions sponsors graduate course whose interdisciplinary content is applicable to students in many programs, in the School of Professions and beyond.

**PRO 507 Transcultural Issues in Health Care.** Examines the issues and implications of health and culture; explores and evaluates social policy issues important to addressing the health needs of specific ethnicultural groups and women; examines a variety of historical and theoretical issues related to health and culture; discusses comparative health issues in developed and developing countries; and compares and contrasts health beliefs, values and practices of a diverse population. There is a major service learning component to this course which provide students with firsthand exposure to a cultural group different from their own. 3 Cr.

**PRO 510 Grants Writing.** A basic, practical, how-to course for the beginning grants writer. Includes types of funding sources, how to identify funding sources, and how to write foundation and government proposals. Requirements include writing a brief sample proposal. Appropriate for all majors. For information, contact Colleen Donaldson, grants development director, (716) 395-5118 or Dean of the School of Professions, 264 Faculty Office Building, (716) 395-2510. 1 Cr. Spring, Summer.

**PRO 552 Spanish for Health Professionals.** Presents basic Spanish language useful for health professionals who work with Spanish-speaking clients. Also examines cultural differences that impact health and health-care decisions. 3 Cr.

**Department of Sociology**

(716) 395-2619

*Chairperson and Professor:* Joan Z. Spade, Ph.D., SUNY Buffalo. *Professor:* Frederic C. Deyo, PhD, University of Chicago. *Assistant Professors:* Jeffrey T. Lashbrook, PhD, University of Rochester; Eileen O’Brien, PhD, University of Florida; Roger K. Steinhauer, PhD, Florida State University; Alan Turley, PhD, University of Texas at Austin. *Visiting Assistant Professor (Great Britain):* John Halsey, PhD, Exeter University. *Distinguished Professor Emeritus:* Edward C. Lehman, PhD, Mississippi State University. *Professors Emeriti:* Frederick S. Halley, PhD, University of Missouri-Columbia; John E. Kramer, Jr., PhD, Yale University; Dorothy A. Mariner, PhD, University of California-Berkeley; Robert J. Potter, PhD, University of Chicago; Robert Rutzen, PhD, Yale University.

While the Department of Sociology does not currently have a graduate degree program, its graduate course offerings may be applied as requirements or electives in degree programs as determined through the advisement process.

**Sociology Courses**

**SOC 512 Schools, Learning, and Society.** Pre-requisite: SOC 100 or 101. Examines the relationships between education and other aspects of society, including social structures and processes through which culture is transmitted from one generation to the next; and possible contributions of education to social and individual order and change. 3 Cr.

**SOC 528 Racial and Ethnic Minorities.** Provides a study of the role of race and ethnicity in social relations. Examines major theoretical orientations toward racial and ethnic stratification, as well as the consequences of inequality for both majority and minority groups. 3 Cr.

**SOC 564 Gender and Social Change.** Examines real and imagined differences between men and women. Reviews the strengths and weaknesses of
various theories explaining gender differences. Explains social and economic consequences of being male or female. Spends time discovering and analyzing social structures and processes contributing to the maintenance of gender patterns. 3 Cr.

**SOC 565 Sociology of Aging.** Provides a survey of social theories and research about older persons in U.S. and other societies. 3 Cr.

**SOC 599 Independent Study.** Prerequisite: Instructor’s permission. Explores various theoretical perspectives on a social phenomenon or sub-area of sociology not covered by other registered courses. Arranged in consultation with the instructor. 3–6 Cr.

### Department of Theatre

(716) 395-2478

Chairperson and Associate Professor: Richard St George, MFA, Illinois State University. Assistant Professor and Set Designer: P. G. Ralph, MA, University of Michigan. Technical Director/Lighting Designer: Gary Musante, MFA, University of Michigan. Costume Designer: Gail Argetsinger, MA, Bowling Green State University; Production Manager: Michael Krickmire, MFA, Illinois State University.

Synthesizing liberal studies with career-oriented theatre and drama training, the Department of Theatre is dedicated to the preparation of students for successful acting and technical theatre careers in professional and semiprofessional venues, while simultaneously enriching the cultural life of the College and surrounding community through the public presentation of quality theatre productions. Theatre education is relevant in many applications and, not surprisingly, a theatre background is useful to and enriching for people in many different occupations.

While the Department of Theatre does not have a graduate degree program, its graduate course offerings may be applied as requirements and/or electives in degree programs as determined through the advisement process.

#### Theatre Courses

**THE 500 Theatre Viewing.** Provides students with the tools and opportunity to critically analyze, evaluate, and appreciate theatre productions. Students view several professional theatre productions and participate in backstage tours and discussion with artistic staff. 3 Cr.

**THE 514 American Theatre.** Covers theatre as an aspect of American culture from 1668 to the present. 3 Cr.

**THE 522 Acting IV.** Prerequisite: THE 323 or 422 or instructor’s permission. Examines specific acting techniques pertaining to various periods, particularly Elizabethan, Restoration, and others selected by the instructor. 3 Cr.

**THE 526 Improvisational Studio.** Covers the development of physical, vocal and improvisational techniques for ensemble playing; and traditional and contemporary techniques of improvisation. Requires experimentation leading to the development of original material; and research and a practicum in the application of dramatic process to a specific learning situation. 3 Cr.

**THE 530 Children’s Theatre Mini-tour.** Prerequisites: THE 281 and 353, and instructor’s permission. Requires students to produce and perform drama in educational settings, and/or community centers on an extended run accompanied by workshops with children. 3 Cr.

**THE 550 Field Experience in Theatre.** Requires students to identify methods, techniques and procedures involved in the project studies; perform these functions and/or observations; and plan a design for implementing the project in a different situation. 3 Cr.

**THE 583 Creative Drama Practicum.** Prerequisite: THE 281 or teaching experience. Focuses on creative drama for children and training leaders to guide youth in informal drama. Requires students to independently guide groups of children in a given dramatic form to ideas and stories. 3 Cr.

**THE 590 Special Topics in Theatre Production.** Prerequisite: Instructor’s permission. Covers advanced directing and advanced problems in scenery, costume and lighting. Topic and instructional methodology is defined by the instructor. 3 Cr.

**THE 599 Independent Study in Theatre.** Designed individually through consultation between the student and instructor to suit the student’s needs and interests and the special competence of the instructor. Additional requirements may be established by the department. 3 Cr.
Women’s Studies

(716) 395-5700

Director: Jennifer M. Lloyd, PhD, University of Rochester.

Graduate work in women’s studies can be undertaken through the Masters of Arts in Liberal Studies (MALS) degree. Utilizing MALS seminars and graduate-level women’s studies courses, students can design a Plan of Study that concentrates on their areas of interest within women’s studies. Because women’s studies courses are cross-listed with their home departments, students have considerable flexibility in course selection. Students may also focus attention on a particular aspect of women’s studies by independent study at two levels (WMS 599 and WMS 699). Graduate courses in women’s studies may also be taken, under advisement, as electives in other MA programs. For information and assistance, please contact the director of the MALS program or the director of women’s studies.

Women’s Studies Courses

WMS 502 (HLS) Women’s Health
WMS 503 (ANT) Biography and Life History
WMS 519 (HLS) Human Sexuality
WMS 527 (ENL) Women in the English Novel
WMS 529 (HST) Women: History and Theory
WMS 538 (HST) Latin-American Women’s History
WMS 541 (ENL) American Literature: 19th-century Women’s Novel
WMS 551 (SOC) Women and Work
WMS 552 (SOC) Women and Health
WMS 557 (ENL) Women and Film
WMS 564 (SOC) Gender Roles
WMS 565 (SOC) Sociology of Aging
WMS 570 (ENL) Women’s Popular Culture
WMS 581 (CRJ) Women and Criminal Justice
WMS 595 (HST) Women, Gender, and Class
WMS 596 (ENL) Sex and Censorship
WMS 599 Independent Study
WMS 699 Independent Study