ENVI RONMENTAL ENE RGY ENGINEERING
Department of Civil and Environmental Engineering
College of Engineering

427 Environmental Toxicology and Society
Spring of odd years. 3(3-0) Interdepartmental with Animal Science; Sociology. Administered by Department of Animal Science, RB: (ISB 200 or ISB 202 or ISB 204 or ISB 206H or BMB 200 or BS 111 or BS 110) Impact of environmental chemicals on health and modern society. Cellular and organ functions and their interface with the environment. Limitations of scientific investigation and environmental regulations.

300 Environmental Engineering Seminar
Fall, Spring. 1(1-0) R: Open only to Environmental Engineering majors. Current research in environmental engineering.

301 Dynamics of Environmental Systems
Spring. 3(3-0) Principles of mass balance, reaction kinetics, mass transfer, reactor theory in environmental engineering.

302 Physicochemical Processes in Environmental Engineering
Fall. 3(3-0) RB: (ENE 801) Physical and chemical principles of air and water pollution control and environmental contaminants in water, air and soils.

304 Biological Processes in Environmental Engineering
Fall. 3(3-0) RB: (ENE 801 or concurrently) Engineering of microbial processes used in wastewater treatment, in-situ bioreclamation, and solid waste stabilization.

806 Laboratory Feasibility Studies for Environmental Remediation
Spring. 3(2-4) R: (ENE 802 and ENE 804) R: Open only to graduate students in Environmental Engineering, Environmental Engineering-Environmental Toxicology, and Environmental Engineering-Urban Studies. Not open to students with credit in ENE 803 or ENE 805. Analysis and characterization of contaminants in soil or water. Conceptual and preliminary design of treatment systems. Use of treatability studies to evaluate treatment options. Oral presentations and preparation of consulting reports with design recommendations.

807 Environmental Analytical Chemistry
Fall. 3(3-0) R: Open only to Environmental Engineering majors. Techniques for measurement and analysis in environmental engineering. Sample preparation. Quality assurance.

808 Environmental Analytical Chemistry Laboratory
Spring. 1(0-3) RB: (ENE 807) R: Open only to Environmental Engineering majors. Laboratory work in environmental analytical chemistry.

880 Independent Study in Environmental Engineering
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to Environmental Engineering majors. Solution of environmental engineering problems not related to student's thesis.

890 Selected Topics in Environmental Engineering
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to Environmental Engineering majors. Selected topics in new or developing areas of environmental engineering.

892 Master's Research Project
Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 5 credits in all enrollments for this course. R: Open only to master's students in the Environmental Engineering major. Approval of department. Master's degree Plan B individual student research project. Original research, research replication, or survey and reporting on a research topic.

899 Master's Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 24 credits in all enrollments for this course. Master's thesis research.

999 Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 72 credits in all enrollments for this course. Doctoral dissertation research.

ENVIRONMENTAL SCIENCE AND POLICY
College of Social Science

801 Physical, Chemical, and Biological Processes of the Environment
Fall. 3(3-0) RB: Bachelor's or Master's in appropriate discipline for specialization. R: Approval of college. SA: SSC 801 Interdisciplinary concepts in the natural sciences related to environmental problems. Ecology and human health.

802 Human Systems and Environment
Fall. 3(3-0) RB: Bachelor's or Master's in appropriate discipline for specialization. R: Approval of college. SA: SSC 804 Anthropological, economic, geographical, legal, political, and sociological concepts of human systems and environmental change.

803 Human and Ecological Health Assessment and Management
Spring. 3(3-0) R: (ESP 801 and ESP 802) R: Familiarity with the basic concepts of physics, chemistry and biology of environmental processes, and the relationships between human systems and the environment. R: Approval of college. SA: SSC 805 Concepts and techniques used to evaluate human and ecological health impacts from anthropogenic activities. Policy formulation and management strategies to mitigate health effects.

804 Environmental Applications and Analysis
Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: Bachelor's or Master's in appropriate discipline for specialization. R: Approval of college SA: SSC 806 Global, regional and local environmental issues. Use of systems approach to identify and solve environmental problems.

EPIDEMIOLOGY

College of Human Medicine

390 Disease in Society: Introduction to Epidemiology and Public Health
Spring. 4(4-0) Interdepartmental with Social Science. Human epidemiology and population health issues facing contemporary society. Developed and less-developed settings. Health-related information in the mass media and scholarly publications.

546 Information Management: Fundamentals of Epidemiology and Biostatistics
Spring. 1(1-0) RB: Undergraduate mathematics and/or statistics R: Open only to graduate-professional students in the College of Human Medicine. Introduction to accessing, analyzing, and applying information to patients and to populations. Offered first ten weeks of the semester.
Causal Inference in Epidemiology
Fall, 3(3-0) RB: (EPI 810 and LCS 829) R: Open only to master's students in the Epidemiology major or approval of department. SA: HM 812
Causal models, criteria, and causality related to study design and analysis in epidemiology. Application of theoretical concepts to the design, analysis, and assessment of epidemiologic research.

Investigation of Disease Outbreaks
Fall, Spring. Summer. 3 credits. RB: (EPI 810 or concurrently) R: Open only to master's students in the Epidemiology major or approval of department. SA: HM 813
Principles of and practice in investigating disease outbreaks. Field trips required.

Nutritional Epidemiology
Fall of odd years. 3(3-0) RB: (EPI 810 or concurrently) R: Open only to master's students in the Epidemiology major or approval of department. SA: HM 814
Methodologies used in epidemiologic studies of diet and health in the context of U.S. and international dietary patterns. Relationship between diet and specific diseases.

Epidemiology of Cardiovascular Disease
Fall of even years. 3(3-0) RB: (EPI 810) R: Open only to master's students in the Epidemiology major or approval of department. SA: HM 815

Perinatal Epidemiology
Summer of odd years. 3(3-0) RB: (EPI 810) R: Open only to graduate students in Epidemiology or approval of department. SA: HM 816
Epidemiology of adverse health states in pregnancy and the puerperium. Impact of these health states on subsequent child development.
A programming approach to plan and write SAS programs to solve common data management and data analysis problems.

SAS Programming II: Data Management and Analysis
Spring. 1(1-0) P:M: (EPI 851) R: Open only to graduate students in the Epidemiology major or approval of department.

A programming approach to plan and write SAS programs to solve data management and data analysis problems in research settings.

Independent Study in Epidemiology
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to master's students in the Epidemiology major. Approval of department. SA: HM 890 Independent study in areas relevant to epidemiology such as population genetics.

Master's Thesis Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open only to master's students in the Epidemiology major. Approval of department. SA: HM 899 Master's thesis research.

Themes in Contemporary Epidemiology
Fall of odd years. 3(3-0) RB: Master of Science in Epidemiology
Discussion and critique of important contemporary themes in epidemiology as reflected in current publications in the field.

Advanced Survival Analysis
Spring of odd years. 3(3-0) Interdepartmental with Statistics and Probability. RB: (EPI 810 and EPI 826 and EPI 852) Methods of analysis of time to event data parametric and nonparametric models, frailty models.

Advanced Methods in Epidemiology and Applied Statistics
Spring of even years. 3(3-0) Interdepartmental with Statistics and Probability. P:M: (EPI 826) Pattern recognition and cluster analysis, longitudinal data analysis, path analysis, repeated measures and time-series analysis.

Modeling in Epidemiology I
Fall of odd years. 3(3-0) P:M: (EPI 910) RB: Experience in statistical analysis of biological data. Critical examination of epidemiological thinking about the determinants of non-communicable diseases.

Modeling in Epidemiology II
Spring of even years. 3(3-0) P:M: (EPI 910 and EPI 925) RB: Mathematics through calculus. Critical examination of epidemiological thinking about the determinants of communicable diseases and illnesses with both communicable and non-communicable causes.

Research Seminar
Spring of even years. 3(3-0) P:M: (EPI 810 and LCS 829 and EPI 812) RB: Master of Science in Epidemiology or equivalent. Conceptualization, development, and writing of research proposals in epidemiology and other forms of clinical field research.

Epidemiological Consultations
Spring of odd years. 3(3-0) P:M: (EPI 810) RB: Master's level training in epidemiology or biostatistics Practical training in providing research consultations in epidemiology and biostatistics.

Molecular Epidemiology
Fall of even years. 3(3-0) P:M: (EPI 910 or concurrently) Strategies for incorporation of genetic and non-genetic biomarkers in epidemiology.

Advanced Biostatistical Methods in Epidemiology
Fall of even years. 3(3-0) P:M: (EPI 920) In-depth study of specific biostatistical methods and epidemiology applications.

Doctoral Dissertation Research
Fall, Spring, Summmer. 1 to 24 credits. A student may earn a maximum of 90 credits in all enrollments for this course. R: Open only to Ph.D. students in Epidemiology. Doctoral dissertation research.

Research Seminar
Spring of even years. 3(3-0) P:M: (EPI 810 and LCS 829 and EPI 812) RB: Master of Science in Epidemiology or equivalent. Conceptualization, development, and writing of research proposals in epidemiology and other forms of clinical field research.

Epidemiological Consultations
Spring of odd years. 3(3-0) P:M: (EPI 810) RB: Master's level training in epidemiology or biostatistics Practical training in providing research consultations in epidemiology and biostatistics.

Molecular Epidemiology
Fall of even years. 3(3-0) P:M: (EPI 910 or concurrently) Strategies for incorporation of genetic and non-genetic biomarkers in epidemiology.

Advanced Biostatistical Methods in Epidemiology
Fall of even years. 3(3-0) P:M: (EPI 920) In-depth study of specific biostatistical methods and epidemiology applications.

Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 90 credits in all enrollments for this course. R: Open only to Ph.D. students in Epidemiology. Doctoral dissertation research.

Organization Design and the Management of Change
Fall. 2(2-0) Fall: MSU Management Educa. RB: (EMB 801) R: Open only to students in the Executive M.B.A. Program. SA: MGT 819 Alternative methods of organization. Dividing tasks and coordinating divided parts. Strategies for implementing new organizational forms and for changing strategies in general.

Managerial Accounting
Fall. 3(3-0) Fall: Troy, MSU Management. P:M: (EMB 802 or concurrently) R: Open only to students in the Executive M.B.A. Program. SA: ACC 812 Use of accounting data for planning, performance evaluation, and control. Costing and pricing. Relevant revenue and cost-based decision making. Information systems in business operations.

Marketing Management
Spring. 2(2-0) Spring: Troy, MSU Mgt Ed Cnr. SA: MSC 822, MSC 823, MSC 820 Concepts, methods, and applications of decision-making to address marketing issues such as market segmentation and positioning, new product development, promotional and distribution strategies. Techniques to model and analyze marketing decision problems to ensure optimal performance results.

Financial Management

Supply Chain Management
Fall, Spring. 3(3-0) Fall: Troy, MSU Mgt Ed Ctr. Spring: Troy, MSU Mgt Ed Ctr. R: Open only to students in the Executive MBA Program. SA: MSC 822, MSC 823, MSC 820 Integrative approach to product design, development, and delivery. Flow of products from concept development through delivery of final user. Product and process development, managing information and product flows. Total quality management. Resource and capacity management.

Strategic Marketing
Fall. 2(2-0) Fall: Troy, MSU Mgt Ed Ctr. R: Open only to students in the Executive M.B.A. Program. SA: ML 818, MTA 818, MSC 818 Models and methods of business planning. Rela- tionship of strategic intent, business missions and planning hierarchies. Linking marketing, financial, and human resource strategic plans.

Law and Business
Fall. 2(2-0) Fall: Troy, MSU Mgt Ed Ctr. R: Open only to students in the Executive M.B.A. Program. SA: GBL 859 Critical analysis of government regulation of business from legal, political, and social perspectives. Moral concepts and social policy underlying government regulation.