ECO Economics

ECO 101 CONTEMPORARY ECONOMIC ISSUES. (3)
A basic course in the analysis of contemporary economic issues with emphasis on current economic topics such as inflation, poverty and affluence, urban congestion, and environmental pollution. (Credit will not be given for this course to students who have received prior credit in ECO 201 and/or 202, and/or ECO 260 and/or 261.)

ECO 201 PRINCIPLES OF ECONOMICS I. (3)
The study of the allocation of scarce resources from the viewpoint of individual economic units. Topics include household and firm behavior, competitive pricing of goods and resources, and monopoly power. (Credit will not be given for this course to students who have received credit in ECO 261.)

ECO 202 PRINCIPLES OF ECONOMICS II. (3)
A study of how society’s needs are satisfied with the limited resources available. Topics include governmental policies such as inflation, unemployment, economic growth, international dependences, and how public policy deals with them. (Credit will not be given for this course to students who have received credit in ECO 260.) Prereq: ECO 201 or equivalent.

ECO 391 ECONOMIC AND BUSINESS STATISTICS. (3)
A survey of statistical techniques relevant to modern economics and business, with major emphasis on correlation and regression, Bayesian decision theory, index numbers, time series analysis, and forecasting models. Prereq: STA 291 or equivalent.

ECO 395 INDIVIDUAL WORK IN ECONOMICS. (1-6)
Students confer individually with the instructor. Written paper usually expected and filed in chairperson’s office. May be repeated to a maximum of six credits. Prereq: GPA of 3.0 in major, approval of instructor and chairperson.

*ECO 401 INTERMEDIATE MICROECONOMIC THEORY. (3)
An analysis of the behavior of consumers and firms, price determination, various market structures, and income distribution. Prereq: ECO 202 or equivalent.

*ECO 402 INTERMEDIATE MACROECONOMIC THEORY. (3)
National income concepts, the determination of aggregate income and employment, the theory of money and inflation and problems of economic growth. Prereq: ECO 202 or equivalent.

#ECO 410 CURRENT ISSUES IN ECONOMICS
(Subtitle required). (3)
The course addresses relevant topics in economics, primarily for non-economic majors. May be repeated for a maximum of six credits under different subtitle. Prereq: ECO 202.

#ECO 411 BUSINESS ECONOMICS. (3)
Applies basic economic principles to the types of problems faced by business decision makers. Particular attention is paid to the economics of organizations and to the economics of firm strategy. Topics covered will include the nature of the firm, the make or buy decision, corporate governance, distribution channels, external market structure, selling decisions, and rivalry and strategy. Prereq: ECO 202 or equivalent.

*ECO 412 MONETARY ECONOMICS. (3)
A detailed discussion of the financial sector of basic static macroeconomic models, including views of both the monetarist and new-Keynesian schools. Institutional aspects of the financial system are discussed. The course stresses problems of economic stabilization. Prereq: ECO 202 or equivalent.

ECO 450G THE ECONOMICS OF POVERTY AND WELFARE PROGRAMS. (3)
Examines the economic conditions of the poor in the U.S., theories of poverty, and major redistribution programs in the U.S. The course will study the economic impacts of such programs as Social Security, Medicare, Aid to Families with Dependent Children, Food Stamps, Medicaid, and child care subsidies. Prereq: ECO 202 or consent of instructor.

ECO 461 MARKET STRUCTURE AND ANTI-TRUST POLICY. (3)
A study of the relationship between industry performance and market structure, and the role and effect of the government’s anti-trust policies. Prereq: ECO 202 or equivalent.

ECO 463 ANALYSIS OF BUSINESS CONDITIONS. (3)

ECO 465G COMPARATIVE ECONOMIC SYSTEMS. (3)
This course deals with the theoretical underpinning of the major economic systems in existence today. The classical model of competitive market capitalism is reviewed first, followed by the Marxian and neo-Marxian (Leninist) critique of capitalism. Next, the contemporary Keynesian and the neo-Keynesian models are analyzed. This course concludes with a review of the Lange model of decentralized (market) socialism. Prereq: ECO 202 or equivalent.

ECO 467 AMERICAN ECONOMIC HISTORY. (3)
The development of the American economy will be examined within the general framework of economic theory. Major emphasis will be given to the long-run process of economic growth of the economy from the colonial period to the present. Prereq: ECO 202 or equivalent.

ECO 471 INTERNATIONAL ECONOMICS. (3)
The basic exchange model is the most important topic in this course. The exchange model is used to illustrate the gains from trade, the role of opportunity costs, and the properties of relative prices. Production considerations, the concept of comparative advantage, and the resulting factor rewards are introduced. Trade distortions are introduced and studied from the point of view of protectionism and its consequences. Fixed and flexible exchange rates and the concept of balance of payments are also covered. Prereq: ECO 202 or equivalent. (Same as AEC 471.)

ECO 473G ECONOMIC DEVELOPMENT. (3)
A comparative study of economic progress in selected countries; growth patterns, theories of development and capital formation, interaction of social and economic change. Prereq: ECO 202 or equivalent.

ECO 479 PUBLIC ECONOMICS. (3)
An application of economic analysis to the study of the role of government. Emphasis is on the role of government and the effects of government intervention in the economy. Topics covered include: market failure, public goods and externalities, welfare policy, voting and public choice, taxation, public debt and cost-benefit analysis. Prereq: ECO 202 or equivalent. (Same as AEC 479.)

*ECO 491G APPLIED ECONOMETRICS. (3)
To provide the student with a firm foundation in the design and estimation of economic models, empirical analysis of economic relationships, and forecasting. Emphasizes the structure and utilization of economic models. Prereq: ECO 391, or consent of instructor.

*ECO 499 SEMINAR IN ECONOMICS
(Subtitle required). (3)
Reading, research and discussion in a seminar format to illuminate problems of historical and contemporary interest in areas of special faculty competence. May be repeated to a maximum of nine credits, but may not be repeated under the same subtitle. Will be limited to a maximum of 15 students. Prereq: ECO 391 and either ECO 487G or 488G.

ECO 590 INTRODUCTION TO QUANTITATIVE ECONOMICS I. (3)
An introduction to mathematical approaches to economic theory. Emphasis on linear models, constrained optimization, and techniques used in comparative statics. Prereq: ECO 488G; MA 113; or consent of instructor. (Same as AEC 590.)

ECO 601 ADVANCED MICROECONOMIC THEORY. (3)
An intensive course covering microeconomic theory and its various methodological and analytical techniques. Prereq: ECO 488G or consent of instructor.

ECO 602 MACROECONOMIC THEORY. (3)
An analysis of market clearing, general equilibrium macroeconomic model. Emphasis on theoretical foundations of relevant behavioral functions and comparative statics. Not open to those with credit in ECO 761. Prereq: ECO 487G or consent of instructor.

*ECO 603 RESEARCH METHODS AND PROCEDURES IN ECONOMICS. (3)
The basic procedures and methods of research in economics are considered from the standpoint of their applicability to problem solving and discovery of new scientific facts and generalizations in economics. Definition of the problem, statement of hypothesis, research design, data collection methods, and data analysis constitute the major topics. Attention is given to proper style and preparation of research reports in economics.
ECON 610 MANAGERIAL ECONOMICS. (3)
Analysis of applications of economic theory to management decision making. Such
problems as demand and cost determination, pricing, and capital budgeting are treated.
Prereq: Graduate standing, MA 123 or its equivalent.

ECON 611 MONEY, FINANCIAL MARKETS, AND THE ECONOMY. (3)
Applied course that covers monetary economics, general macroeconomics conditions,
financial markets, and forecasting techniques. Topics include the determination of
national income, the roles of the monetary sector and financial markets, expectations,
and business cycles. A description of formal and informal forecasting techniques in
common use by financial market participants will be included. Prereq: Graduate
standing, and successful completion of an upper division undergraduate or graduate level
economics course, or consent of instructor.

ECON 652 PUBLIC POLICY ECONOMICS. (3)
Principles and practices of economical resource management in the governmental sector:
tax and expenditure types, intergovernmental fiscal cooperation, debt financing,
budgeting and financial planning. Prereq: MPA or MHA program status; prereq or
concur: completion of MPA or MHA computer skills program requirement. (Same as
HA/PA 652.)

ECON 653 HEALTH ECONOMICS. (3)
This course applies general theoretical principles of economics to the health care sector.
The basic approach is to recognize the importance of scarcity and incentives, allowing
for differences peculiar to health. The demand and supply of health and medical care are
examined as they involve physicians, nurses and hospitals. The competitiveness of their
markets, health insurance and the role of government are explored. Special topics include
regulation and planning, benefits-cost analysis, and reform health plans. Prereq: PA 652,
HA 601, HA 621, MHA or MPA program status. (Same as HA/ISM/PA 636.)

ECON 654 BENEFIT-COST ANALYSIS. (3)
Principles, practices and applications of applied welfare analysis are the content of this
course. The basic theory of benefit-cost analysis is presented and the relevance of
implementation analysis in policy analysis is established. Prereq: PA 652. (Same as
PA 680.)

ECON 670 ECONOMICS OF INTERNATIONAL FINANCIAL INSTITUTIONS. (3)
An in-depth study of financial markets, commercial banking, and business finance in
an international setting. Prereq: ECO 471G, 485G.

ECON 672 WORLD TRADE AND COMMERCIAL POLICY. (3)
An analysis of trade patterns and the implication of government policy on trade, in the
light of both economic theory and empirical findings. Prereq: Successful completion of
an upper division undergraduate or graduate level economics course.

ECON 674 AGRICULTURE AND ECONOMIC DEVELOPMENT. (3)
Analytical consideration of the role of agriculture in economic development in relation
to overall development strategy at various stages of growth. Theoretical and policy issues
of particular relevance to the agricultural development in underdeveloped agrarian
economies with various resource, social, political and economic systems. Prereq: ECO
473G or consent of instructor. (Same as AEC 626.)

ECON 700 TEACHING METHODS IN BUSINESS. (1)
A three part course that examines what constitutes good teaching and explores effective
techniques for college instruction. Seminars emphasize practical information for both
the principal activities and the details of teaching. Departmental discussions allow
students to discuss issues that arise in their teaching practice. Reviews of classroom
performance provide professional feedback in order to enhance on-the-job learning.
Seminar, two hours per week. Prereq: Approval of Director of Graduate Studies. (Same
as BA 700.)

ECON 701 NEOCLASSICAL MICROECONOMIC THEORY. (3)
The Neoclassical theory of consumer behavior, production, market equilibrium and
imperfect competition. Prereq: ECO 448G, 590 or consent of instructor.

ECON 702 ADVANCED MACROECONOMIC THEORY. (3)
Analysis of general equilibrium macroeconomic models and factors responsible for
deviations from general equilibrium. Emphasis is on issues from recent professional
literature. Prereq: ECO 602 or consent of instructor.

ECON 703 INTRODUCTION TO ECONOMETRICS I. (3)
The first course in the introduction to econometrics. A comprehensive survey of the
general linear regression, autocorrelation, errors in variables and distributed lag models.
Prereq: ECO 603, STA 424G, STA 525 or consent of instructor.

ECON 704 GENERAL EQUILIBRIUM ANALYSIS AND WELFARE ECONOMICS. (3)
Existence, stability, efficiency and Pareto satisfactoriness of competitive equilibrium.
Recent developments in general equilibrium and welfare theory. Prereq: ECO 488G,
590 or consent of instructor.

ECON 705 MACROECONOMIC DYNAMICS. (3)
Theoretical and empirical assessment of dynamic issues in macroeconomics. Topics
include neoclassical and endogenous growth models and vector autoregressions. Prereq:
ECO 702 or consent of instructor.

ECON 706 INTRODUCTION TO ECONOMETRICS II. (3)
The second course in the introduction to econometrics. A comprehensive survey of
identification, estimation and hypothesis testing in the context of simultaneous
equations model. Prereq: ECO 691 or consent of instructor.

ECON 707 RESEARCH SEMINAR IN ECONOMICS. (3)
This course will help students develop research skills by requiring them to work through
an independent project from start to finish. The student will review the literature and
select a topic in an area of economics of interest. The student will then complete the
project under the guidance of the instructor. Students will discuss their ongoing work
in class with other students and in individual meetings with the instructor. The final
output of the course will be a finished paper suitable for submission to a scholarly journal
for publication. Prereq: Passing the Theory Exams or permission of the instructor.

ECON 710 ECONOMICS OF ORGANIZATION. (3)
The Economics of Organization applies transactions costs and principal-agent theories
to study the internal organization of the firm. Topics covered include the boundaries
of the firm, corporate governance, and internal incentive systems. Prereq: ECO 610 or
equivalent.

ECON 711 ECONOMICS OF FIRM STRATEGY. (3)
The Economics of Firm Strategy applies economic tools to the analysis of firm strategy.
Topics to be covered include basic cost and demand conditions, economies of scale and
scope, product differentiation, entry and mobility conditions, price discrimination
and commodity bundling, vertical control, and rivalry and strategy. Prereq: ECO 610 or
equivalent.

ECON 715 HISTORY OF ECONOMIC THOUGHT. (3)
A survey of the foundations of modern economics with special emphasis on the writing
of Adam Smith, Karl Marx, and Alfred Marshall.

ECON 721 ENVIRONMENTAL ECONOMICS, REGULATION AND POLICY. (3)
This course takes a balanced practitioner approach to the problems of the environment
and environmental regulation. Efficiency aspects will be developed carefully, so as to
provide a background for an extensive coverage of various available alternative policies.
Prereq: PA 652 and MPA or economics program status or consent of instructor. (Same as
PA 727.)

ECON 731 LABOR ECONOMICS I. (3)
The theory and estimation of the demand for and the supply of labor are introduced. Topics
include demographic changes, minimum wages, retirement, and secular trends in labor
force participation. The concept of human capital is examined, including applications
to income distribution. Theory and evidence on the structure of wages in the U.S. is
considered. Topics include compensating wages and race and gender differences. Prereq:
ECO 487G and ECO 488G or consent of instructor.

ECON 732 LABOR ECONOMICS II. (3)
Dynamic and cyclical labor demand are examined theoretically and empirically. Models
of unemployment are considered, including search theory and the implicit contract
model. Aspects of labor unionism are examined including changes in union membership,
strikes, and union wages and employment. The incentive effects of compensation are
discussed, including sorting models and the principal-agent problem. Prereq: ECO 601 or
consent of instructor.

ECON 741 THEORY OF THE FIRM AND MARKET STRUCTURE. (3)
A study of firms and markets covering such topics as organizational structure and
objectives of firms; product selection, advertising and quality; price discrimination;
vertical control; entry, accommodation and exit; cost structure and market organization,
market structure and performance; and public policy. Prereq: ECO 660.

ECON 742 INDUSTRIAL ORGANIZATION. (3)
A comprehensive survey of the literature in industrial organizations including static
theories of oligopoly, dynamic theories of oligopoly, information about strategic
behavior, research and development, patents, and adoption of new technology.
ECO 740 DISserTATION REseARCh. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

ECO 751 PuBlic EcoNomiCS. (3)
An advanced study of both how government activities influence allocation, relative prices and welfare and what is the proper role of the public sector in resource allocation. Relevant topics include: public goods, externalities, tax incidence, optimal taxation, benefit-cost analysis, public pricing, fiscal federalism, state-municipal finance and public choice. Prereq: ECO 487G, 488G or consent of instructor.

ECO 752 THE EcoNomiCS OF PoliCy ANALYsiS. (3)
This course examines economic approaches to policy analysis. Included is an analysis of the major concepts of economic analysis and their application to a number of policy problems. Prereq: PA 652 or equivalent, and Ph.D. program status or consent of instructor. (Same as PA 752.)

ECO 753 URBAN AND REgIONAL ECONomiCS. (3)
An intensive study of the theory, evidence and policy concerning urban areas and regions. Topics typically covered include: nature of regions and urban areas, size and distribution of cities, location decisions, housing, transportation, migration and regional growth. Prereq: ECO 487G, 488G, 492G or consent of instructor.

ECO 766 MoNeTARY EcoNomiCS: THEory. (3)
Demand and supply of money and other assets. The financial sector in macro-static and dynamic models of the economy. Prereq: ECO 701, ECO 702 or consent of instructor.

ECO 767 MoNeTARY EcoNomiCS: PoLiCY. (3)

ECO 768 RESiDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

ECO 769 RESiDENCE CREDIT FOR THE DOCTOR’S DEGREE. (0-12)
May be repeated indefinitely.

*ECO 771 INTERNATIONAL EcoNomiCS: INTERNATIONAL MoNeY AND FINANCE. (3)
International finance and open economy macroeconomics; the balance of payments; theory of exchange rate determination; macroeconomic policy issues in open economies. Prereq: ECO 602.

ECO 772 INTERNATIONAL EcoNomiCS: TRADE THEory AND PoLiCY. (3)
Theory and empirical analysis of the effects of trade and trade policy. Prereq: ECO 601.

*ECO 781 OptiMiZATION AND EcoNOMIC THEory I. (3)
A study of the applications of optimization techniques such as search theory, the calculus of variations, optimal control theory, and dynamic programming through economics. Applied topics may include the economics of information, economics of uncertainty, and modern theories of consumer and firm behavior. Prereq: ECO 701, 702 or permission of instructor.

*ECO 782 OptiMiZATION AND EcoNOMIC THEory II. (3)
The specific areas of study may differ from one semester to the next, but will be selected from such subjects as general equilibrium theory, social choice, game theory, economics of uncertainty, and the economics of information. Prereq: ECO 701, 702 or permission of instructor.

ECO 790 TiME SEriES ANAlYsiS. (3)
Time series and stochastic processes, auto-correlation functions and spectral properties of stationary processes; linear models for stationary processes, moving average, autoregressive and mixed auto-regressive-moving average processes; linear nonstationary models, minimum mean square error forecasts and their properties; model identification, estimation and diagnostic checking. Prereq: STA 422G or its equivalent. (Same as STA 626.)

ECO 792 ECONOMetiCS I. (3)
The first course in the econometrics area of specialization. A comprehensive survey of general linear regression analysis; autocorrelation; errors in variables models; distributed lag models. Prereq: ECO 706 or consent of instructor.

*ECO 793 ECONOMetiCS II. (3)
The second course in the econometrics area of specialization. A comprehensive survey of identification, estimation, and hypothesis testing in the context of the simultaneous equations model. Prereq: ECO 706 or consent of instructor.

ECO 796 SEmAInAR. (1-6)
An extended original investigation of some specific topic with a view to giving training in methods of research and studying intensively a particular subject in the field of economics. May be repeated to a maximum of six credits.

*ECO 797 RESEARCH PROBLEMS IN EcoNomiCS. (1-9)
Students confer individually with the instructor. May be repeated to a maximum of nine credits. Prereq: Permission of the Director of Graduate Studies is required.

EDA 401 THE PROFESSIONAL TEACHER: LEGAL PERSPECTIVES. (1)
Study of legal concerns of public school teachers. Emphasizes legal rights and responsibilities of teachers and pupils. Lecture, two hours per week for eight weeks. Prereq: Admission to the Teacher Education Program.

EDA 600 ORGANIZATION AND ADMINISTRATION OF AMERICAN EDUCATION. (3)
An analysis of the administration of local, state and federal education agencies and their relationships. A study of the administrative tasks in these agencies.

EDA 601 INTRODUCTION TO SCHOOL LEADERSHIP AND ADMINISTRATION. (3)
Study of school leadership and administrative responsibilities, with emphasis on understanding schools as complex organizations and facilitating leadership to create a work climate supportive of excellence in teaching and learning.

EDA 610 SCHOOL LEADERSHIP PRACTICUM. (3)
An analysis of the role of the school principal in practice with emphases on changes in society and in the schools. It is a requirement of this course that students spend time interacting with practicing school administrators at school site locations. Prereq: Twelve hours of course work in the principalship program must be completed prior to enrollment.

EDA 624 TECHNOLOGY AND BEST PRACTICES FOR SCHOOL IMPROVEMENT. (3)
The focus of the course is on identification of best practices for school improvement documented by research and application of these practices to diverse school contextual settings. Practice and application of technology in researching worldwide school improvement activities and research will take place through internet searches and library database searches.

EDA 627 SCHOOL FINANCE AND SUPPORT SERVICES. (3)
Study of concepts in school finance and school business management. Attention is given to national, state, and local issues. Emphasis is also given to school support services, including transportation, facility planning and maintenance, food service, and risk management. Prereq: Program status or consent of instructor.

EDA 628 SCHOOL LAW AND ETHICS. (3)
Study of legal and ethical issues as related to practical problems of school administration. Constitutional provisions and court decisions are examined as they impact education. Prereq: Program status or consent of instructor.

EDA 629 THE PRINCIPAL. (3)
An analysis of the building unit as a sub-system within a larger complex organization. Special emphasis on the changes in the role of the principal as a result of changes in society and in the schools. Prereq: Admission to department program or consent of instructor.

EDA 631 LEADERSHIP FOR SCHOOL PROGRAM COLLABORATION. (3)
This course prepared school leaders to administer integrated instructional support programs in schools and districts. Attention is also given to leadership responsibilities needed to facilitate collaboration among school and community-based programs that provide and support student learning. Prereq: Program status or consent of instructor.

EDA 632 ADMINISTRATION OF EDUCATIONAL REFORM. (3)
Study of administrative responsibilities associated with the development and implementation of educational reform and improvement projects and programs. Focus on knowledge and skills needed to work effectively with others in promoting successful program implementation. Prereq: Admission to Department program or consent of instructor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>EDA 634</td>
<td>LEADERSHIP FOR HUMAN RESOURCES DEVELOPMENT IN SCHOOLS.</td>
<td>(3)</td>
<td>Study of human resources development practices in school systems, with emphasis on central office and school unit responsibilities for attracting, selecting, developing, evaluating, and retaining competent faculty and staff. Prereq: Program status or consent of instructor.</td>
</tr>
<tr>
<td>EDA 639</td>
<td>THE SUPERVISOR.</td>
<td>(3)</td>
<td>A study of the role of the supervisor of instruction as part of administrative leadership in improving instructional programs with special emphasis on in-service education of staff. Prereq: Admission to program or consent of instructor.</td>
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<tr>
<td>EDA 642</td>
<td>MICROCOMPUTER APPLICATIONS IN ADMINISTRATION.</td>
<td>(3)</td>
<td>This course provides prospective and practicing administrators with the opportunity to gain practical and theoretical knowledge in the subject matter related to microcomputer applications in the school environment.</td>
</tr>
<tr>
<td>EDA 646</td>
<td>LEADERSHIP FOR SCHOOL COMMUNITY RELATIONS.</td>
<td>(3)</td>
<td>Study of issues and responsibilities relating to the establishment and administration of a school community relations program at the school district and the school building levels. Prereq: Program status or consent of instructor.</td>
</tr>
<tr>
<td>EDA 649</td>
<td>THE SCHOOL SUPERINTENDENCY.</td>
<td>(3)</td>
<td>A study of the work of the chief executive of a school district. Special emphasis upon the development and implementation of policy. Prereq: Admission to the program and consent of instructor.</td>
</tr>
<tr>
<td>EDA 650</td>
<td>LEADERSHIP FOR SCHOOL PROGRAM IMPROVEMENT.</td>
<td>(3)</td>
<td>Study focusing on the preparation of school leaders to guide, facilitate and support curriculum, instruction, and assessment and to create a learning environment that promotes student achievement. Prereq: Program status or consent of instructor.</td>
</tr>
<tr>
<td>EDA 651</td>
<td>FOUNDATIONS OF INQUIRY.</td>
<td>(3)</td>
<td>Introductory study of assumptions and procedures of systematic inquiry used to investigate administrative, leadership, and supervisory phenomena in education. Issues regarding both quantitative and qualitative models of inquiry are included. Prereq: ADSU major or consent of instructor.</td>
</tr>
<tr>
<td>EDA 669</td>
<td>LEADERSHIP FOR SCHOOL PROBLEM SOLVING.</td>
<td>(3)</td>
<td>Principles and methods of systematic site-based problem identification, diagnosis, and solution for the improvement of practice in school settings. Prereq: Program status or consent of instructor.</td>
</tr>
<tr>
<td>EDA 671</td>
<td>LEADERSHIP IN EDUCATIONAL ORGANIZATIONS I.</td>
<td>(3)</td>
<td>A study of leadership with particular emphasis on understanding the nature, defining characteristics, responsibilities, contextual determinants, and importance of leadership within educational organizations. Prereq: Admission to Department program or consent of instructor.</td>
</tr>
<tr>
<td>EDA 702</td>
<td>LEADERSHIP IN EDUCATIONAL ORGANIZATIONS II.</td>
<td>(3)</td>
<td>A study of leadership with particular emphasis on examining the lives and actions of individual leaders for the purpose of understanding the nature, requirements and importance of leadership within educational organizations. Leadership theory is used to inform the discussion about each leader identified and studied. Prereq: Admission to the Department program or consent of instructor.</td>
</tr>
<tr>
<td>EDA 749</td>
<td>DISSERTATION RESEARCH.</td>
<td>(0)</td>
<td>Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.</td>
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<tr>
<td>EDA 769</td>
<td>RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE.</td>
<td>(0-12)</td>
<td>May be repeated indefinitely.</td>
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<tr>
<td>EDA 770</td>
<td>TOPICAL SEMINAR IN EDUCATIONAL LEADERSHIP.</td>
<td>(1-3)</td>
<td>Advanced graduate students enroll in this topical seminar to enhance their portfolios for educational leadership through concentrated study of innovations in the specialized functions of administration. These specializations include, but are not limited to, the study of curriculum and instructional leadership, educational law, personnel administration, school and community relations, education for diverse populations, budgeting and financing of schools.</td>
</tr>
<tr>
<td>EDA 771</td>
<td>SEMINAR IN ADMINISTRATION.</td>
<td>(1-3)</td>
<td>A variable topic seminar on selected problems in school administration. Activities designed to improve skills in planning, decision making, organizing, communicating, evaluating, negotiating, and resolving conflict will be provided as appropriate. Educational innovations and processes of implementing change may be analyzed. May be repeated to a maximum of six credits. Prereq: Admission to program or consent of instructor.</td>
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<tr>
<td>EDA 785</td>
<td>INDEPENDENT WORK IN SCHOOL ADMINISTRATION.</td>
<td>(3)</td>
<td>Includes research on a practical problem in school administration. Open only to students with at least one semester of graduate work in education. May be repeated to a maximum of six credits. Prereq: Consent of instructor.</td>
</tr>
<tr>
<td>EDA 792</td>
<td>RESEARCH IN EDUCATIONAL ADMINISTRATION AND SUPERVISION.</td>
<td>(3)</td>
<td>Critical examination of representative research studies in administration and related fields. Emphasis upon the students’ defining and delimiting an appropriate problem in educational administration and supervision, generating a design appropriate to the problem and selecting appropriate techniques of analysis. Prereq: Admission to program.</td>
</tr>
<tr>
<td>EDC 317</td>
<td>INTRODUCTION TO INSTRUCTIONAL MEDIA.</td>
<td>(1)</td>
<td>An introductory instructional media experience including basic production and utilization techniques for media materials and operation of commonly used educational media equipment. Topics include graphic preservation, transparency production, audio materials, motion pictures, 35mm photographic techniques, and an introduction to videotape television. Prereq: Admission to a Teacher Education Program.</td>
</tr>
<tr>
<td>EDC 322</td>
<td>ELEMENTARY PRACTICUM.</td>
<td>(1-3)</td>
<td>Planned and supervised practicum in teaching elementary science, reading, social studies, and mathematics. Observation, selecting objectives and materials, questioning strategies, learning centers, instructional units, and assessment techniques will be emphasized. May be repeated to a maximum of three credits. Lecture, one hour; laboratory, six to twelve hours per week. Prereq: Admission to Early Elementary TEP. Concur: EDC 323, EDC 326, EDC 328, EDC 337, and EDC 339.</td>
</tr>
<tr>
<td>EDC 323</td>
<td>CLASSROOM MANAGEMENT AND DISCIPLINE.</td>
<td>(3)</td>
<td>EDC 323 should be taken in conjunction with EDC 329. Prereq: Admission to Teacher Education Program.</td>
</tr>
<tr>
<td>EDC 326</td>
<td>TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL.</td>
<td>(3)</td>
<td>A study of methods and materials for teaching social studies at the elementary level. The course will include a critical analysis of a variety of objectives, instructional materials and strategies, and evaluation techniques for elementary social studies. Consideration will be given to addressing the individual needs of a diverse student population. Special emphasis is placed on instruction in grades K–4. Twenty hours of field experience are required in conjunction with EDC 322. Prereq: Admission to TEP and 15 hours of social sciences. Coreq: EDC 322.</td>
</tr>
<tr>
<td>EDC 328</td>
<td>TEACHING SCIENCE IN THE ELEMENTARY SCHOOL.</td>
<td>(3)</td>
<td>A critical analysis of a variety of objectives, instructional materials and evaluation techniques for teaching elementary school science, with a special emphasis on grades K–4. Consideration will be given to addressing the individual needs of a diverse student population. Twenty hours of field experience are required in conjunction with EDC 322. Prereq: Admission to TEP and 12 hours of science. Coreq: EDC 322.</td>
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<tr>
<td>EDC 329</td>
<td>TEACHING READING AND LANGUAGE ARTS.</td>
<td>(3)</td>
<td>Development of competencies for the teaching of reading and other language arts to groups. Course will also provide an overview of the nature of reading and language arts development from grade K–8. Twenty hours of laboratory work in the schools are required. Prereq: Admission to Early Elementary Education TEP or Middle School TEP.</td>
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</table>

**KEY:** # = new course  * = course changed  † = course dropped  ¶ = course removed from Bulletin due to inactivity
EDC 330 DESIGNING A READING AND LANGUAGE ARTS PROGRAM FOR THE MIDDLE SCHOOL. (3)
A study of materials and techniques useful in the diagnostic teaching of reading and other language arts with students in grades 5-8. The course will emphasize materials, techniques, and procedures which diagnose individual strengths and weaknesses, and prescriptive instruction based upon the diagnosis. Lecture, three hours; laboratory, one hour. Prereq: EDC 329 or consent of instructor; admission to the Teacher Education Program.

EDC 334 ORAL AND WRITTEN LANGUAGE DEVELOPMENT IN THE ELEMENTARY SCHOOL. (3)
A study of language differences, methods for teaching children with language differences, ways to integrate oral language instruction with the total curriculum, ways to enhance students' expressive writing abilities, and ways to teach grammar, spelling, and handwriting through functional and creative writing activities. Prereq: EDC 329 and admission to the elementary teacher education program.

EDC 337 TEACHING MATHEMATICS IN ELEMENTARY SCHOOLS. (3)

EDC 339 DESIGNING A READING AND LANGUAGE ARTS PROGRAM FOR THE ELEMENTARY SCHOOL. (3)
A study of materials and procedures for developing reading and language arts skills with elementary students, with an emphasis on grades K-4. Course will emphasize how to diagnose individual student skill strengths and weaknesses and build a prescriptive program based upon the diagnosis. Prereq: EDC 329; admission to the TEP or permission of instructor. Coreq: EDC 322.

EDC 341 MIDDLE SCHOOL CURRICULUM AND INSTRUCTION. (3)
This course is designed to acquaint teachers of early adolescents with the rationale behind the middle school concept, and, in particular, the techniques of teaching as an individual and as a member of an interdisciplinary team. The development of generic teaching skills such as planning, implementing, managing, and evaluating learning programs is emphasized. Prereq: Admission to Teacher Education Program.

EDC 342 STUDENT TEACHING IN ART. (3-12)
Designed to give the student practical experience through observation, planning, teaching, and evaluating procedures. The student works with children on all grade levels under the guidance of the supervising teacher. Offered on a pass/fail basis only. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDC 343 THE EARLY ADOLESCENT LEARNER: PRACTICUM. (3)
This course is designed to extend and apply knowledge of the social, emotional, intellectual, and physical characteristics of the early adolescent learner through observation and interaction in school settings. The course format will include a weekly seminar and a supervised field placement in a middle school setting. Lecture, one hour; laboratory, six hours per week. Prereq: Admission to Teacher Education Program.

EDC 345 TEACHING MATHEMATICS IN THE MIDDLE SCHOOL. (3)
A study of theoretical models and methodological strategies for teaching arithmetic, informal geometry, and introductory algebra at the middle school level. The course will include a critical analysis of a variety of objectives, instructional materials and strategies and evaluation techniques. Consideration will be given to addressing the individual needs of a diverse student population. Prereq: Admission to Teacher Education Program; 18 hours of undergraduate mathematics. Concur: EDC 330 and EDC 343.

EDC 346 TEACHING SOCIAL STUDIES IN THE MIDDLE SCHOOL. (3)
A study of theoretical models and methodological strategies for teaching social studies at the middle school level. The course will include a critical analysis of a variety of objectives, instructional materials and strategies, and evaluation techniques for middle school social studies. Consideration will be given to addressing the individual needs of a diverse student population. Prereq: Admission to TEP; completion of 24 hours in social studies. Concur: EDC 330 and EDC 343.

EDC 347 TEACHING ENGLISH AND COMMUNICATION IN THE MIDDLE SCHOOL. (3)
This course will explore various approaches to teaching English and communication in the middle school with special emphasis on the nature of language development. Prereq: Admission to the TEP and 24 hours in English/communication specialization. Concur: EDC 330 and 343.

EDC 348 TEACHING SCIENCE IN THE MIDDLE SCHOOL. (3)
A study of theoretical models and methodological strategies for teaching science at the middle school level. This course will include a critical analysis of a variety of objectives, instructional materials and strategies, and evaluation techniques for middle school science. Special needs of individuals in a diverse middle school population are emphasized. Prereq: Admission to TEP and 24 hours of science. Concur: EDC 330 and 343.

EDC 349 STUDENT TEACHING IN THE MIDDLE SCHOOL. (3-12)
This course is designed to give the student experience teaching within a middle school setting. Weekly seminars will be held to discuss issues relevant to the student teacher's experience. Offered on a pass-fail basis only. Lecture, 1 hour; laboratory, 30 hours per week. Prereq: Must meet published college requirements for student teaching.

EDC 353 STUDENT TEACHING IN ENGLISH. (3-12)
Observation and practice in teaching high school English. Included are objectives and content of English courses in high school, planning and methods of teaching, testing, textbook analysis, audio-visual material and equipment, and safety education. Offered on a pass-fail basis only. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDC 354 STUDENT TEACHING IN LANGUAGES. (3-12)
Aims and objectives, courses of study, materials, and testing in French, Spanish, and Latin. Includes observation and practice in the content field, safety education, audio-visual aids, and planning conferences with the supervising teacher. Offered on a pass-fail basis only. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDC 355 STUDENT TEACHING IN THE SCIENCES. (3-12)
Aims and objectives, courses of study, methods, tests, equipment, general science, biology, physics, and chemistry. The course includes observation and practice, safety education, audio-visual aids, and planning conferences with the supervising teacher. Offered on a pass-fail basis only. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDC 356 STUDENT TEACHING IN MATHEMATICS. (3-12)
Aims and objectives, course of study, materials, methods, and testing in algebra, geometry, and trigonometry. Includes observation and practice in the content field, safety education, audio-visual aids, and planning conferences with the supervising teacher. Offered on a pass-fail basis only. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDC 357 STUDENT TEACHING IN THE SOCIAL STUDIES. (3-12)
Includes a study of the development and present status of social studies programs, classroom methods and activities, teaching materials, testing and evaluation, professional aids to teachers, safety education, and observation and participation in actual classroom experiences. Offered on a pass-fail basis only. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDC 358 STUDENT TEACHING IN PSYCHOLOGY. (3-12)
Culminating in intensive half to full semester field experience in teaching psychology. Forty-hour laboratory per week. May be repeated to a maximum of 12 credits. Offered on a pass-fail basis only. Prereq: Completion of the academic and professional sequence required in social studies education prior to student teaching.

EDC 362 FIELD EXPERIENCES IN SECONDARY EDUCATION. (1-3)
Supervised experiences in schools, other education agencies, and the community. Required of all students receiving a bachelor's degree in secondary education. Includes field trips, work in schools, and involvement in community projects.

EDC 377 STUDENT TEACHING IN MUSIC. (3-12)
A course planned for teachers who expect to become either instructors or supervisors of music in the public schools. Observation, teaching, work on research problems, and conferences with the supervising teacher included. Offered on a pass-fail basis only. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDC 421 SURVEY OF SECONDARY MATHEMATICS CURRICULUM. (3)
This course will examine the content of the mathematics curriculum of the secondary school and issues related to that curriculum. Students are expected to demonstrate competency in this content.
EDC 433 STUDENT TEACHING IN THE ELEMENTARY SCHOOL. (3-12)
A course designed to give the student experience with and practice in the program of an elementary school. Actual work with children in all learning situations is the basic part of the course. A required weekly seminar will include sessions on: beginning teacher internship, school law and students' rights, administrative organization, and professional development. Offered on a pass/fail basis only. Prereq: Must meet the published college requirements for student teaching.

EDC 499 SOCIAL PROCESSES AND EFFECTS OF MASS COMMUNICATION. (3)
The relationship between the organization of modern society and its communication media. Special emphasis is given to the way in which cultural processes and social change have an impact on the mass media, and on the way in which the mass media influence cultural processes and social change. The social-psychological bases of communication are studied within a context of theory and research. Prereq: COM/SOC 249 or its equivalent. (Same as COM/SOC 449.)

EDC 454 CULTURE, EDUCATION AND TEACHING ABROAD. (3)
Introduction to the social, political, economic, and educational institutions of another country in preparation for student teaching in that country. The process and problems of adjusting to life in another culture will be included as well as instruction in the language of the host country as needed. Faculty from other departments in the University will be used as well as informants from the country involved. Lecture, three hours per week; laboratory, two hours per week for language practice. Prereq: Permission of instructor for students outside of the College of Education. (Same as EPE 454.)

EDC 501 TEACHING INTERNSHIP. (1-12)
Supervised practice teaching under competent leadership. Observation, instruction, independent study which parallels field experience, and conferences with supervising instructor included. This course is designed primarily for students in Allied Health Professions, Education, Library and Information Science, Home Economics, and Social Work. May be repeated to a maximum of 12 hours. Prereq: EDC 500 or permission of instructor.

EDC 513 TEACHING ENGLISH AS A SECOND LANGUAGE. (3)
The course will examine new current theories and methods of teaching English as a second language. The course will include (1) language learning theory as it relates to other disciplines; (2) methods and techniques of contrastive analysis. Prereq: One course in linguistics or consent of instructor. (Same as ENG 513.)

EDC 514 TEST MATERIALS AND METHODS. (3)
An extension of ENG/EDC 513, this course will include examination and evaluation of published materials designed for teaching English to speakers of other languages. Students will create individualized teaching materials and gain practical experience in applying the methods and using their own materials. Prereq: ENG/EDC 513 or consent of instructor. (Same as ENG 514.)

EDC 533 TEACHING READING IN THE SECONDARY SCHOOL. (3)
A study of current methods and materials useful in teaching reading in secondary schools with particular emphasis on the improvement of reading in the content areas. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDC 534 READING AND STUDY SKILLS IN ENGLISH. (3)
An introductory course for teachers of English. The emphasis is on developing competencies necessary for teaching reading and study strategies in the English and humanities curriculum, especially at the junior and senior high school levels. Lecture, three hours; laboratory, one hour. Prereq: Junior standing, admission to the TEP in English education, or consent of instructor.

EDC 543 VIDEO FOR DISTANCE EDUCATION AND MULTIMEDIA. (3)
A variety of video applications for distance education and multimedia are discussed. Classroom exercises and projects develop basic video skills and production experience needed for distance education course delivery and development and multimedia projects. Topics include instructional video research, video equipment, terminology and systems, and message design issues.

*EDC 544 USE AND INTEGRATION OF INSTRUCTIONAL MEDIA. (3)
Students use a range of traditional, interactive, and emerging technological interventions in analog and digital formats. Students gain skill in the production, production and integration of basic media such as video, graphs, videodisk, and CD-ROM in a variety of instructional settings (training, exploratory learning, on-line databases, etc.). Students demonstrate skills via the composition and production of several media documents using available tools and resources.

EDC 547 INSTRUCTIONAL COMPUTING I. (3)
Students use instructional computing applications and understand the roles and uses of computers in instruction. Students select and use instructional computing hardware and software appropriate to instructional goals and settings. Students use electronic networks for instructional purposes. Students demonstrate skill using basic productivity software through structured assignments and collaborative projects.

EDC 548 INSTRUCTIONAL COMPUTING II. (3)
Students develop skill in advanced aspects of the operation and use of the range of instructional technologies from desktop to distributed computing environments. Students use operating systems, learn network administration, do technology planning, and work with basic authoring tools. Skill is demonstrated through a series of projects including development of a technology plan for a specified work setting and authorship of a prototype program. Prereq: EDC 547 or consent of instructor.

EDC 550 EDUCATION IN A CULTURALLY DIVERSE SOCIETY. (3)
A critical study of the concept of disadvantage, relevant teaching practices, institutional programs, and curricula.

EDC 565 MODERN EDUCATIONAL PROBLEMS. (GENERAL CURRICULUM). (3)
EDC 575, 576 MODERN EDUCATIONAL PROBLEMS. (UNCLASSIFIED). (3 ea.)
EDC 580 INTRODUCTION TO GIFTED EDUCATION. (3)
This course reviews the historical development of and the theoretical and empirical support for differentiated educational programs for gifted and talented children. Specific issues addressed include defining and identifying giftedness, teacher competencies and training, providing differentiated curricula and program evaluation. (Same as EDP 580.)

EDC 602 CURRICULA AND PROGRAMMING FOR THE GIFTED. (3)
Students in this course will examine and evaluate curricular models appropriate of gifted students, and will consider methods for adapting existing curricula to meet the needs of gifted students. The design, implementation and evaluation of program delivery models will be discussed. Prereq: EDC/EDP 580 and teacher certification, or consent of instructor.

EDC 607 INSTRUCTIONAL DESIGN I. (3)
Introduction to the instructional design process from needs assessment and goal definition through evaluation. Each student will design prototype instructional materials based on an instructional design model and/or procedures. The course will also introduce students to the field of instructional design and technology.

EDC 608 INSTRUCTIONAL DESIGN II. (3)
Critical analysis of instructional design models and their theoretical foundations including the impact of various models and perspectives on the practice and the products of instructional design. Prereq: EDC 607 or consent of instructor.

EDC 609 INTERACTIVE MULTIMEDIA RESEARCH AND DESIGN. (3)
Students integrate theory and practice in the design of interactive multimedia for instruction. Students use a wide range of interactive technology and critique existing interactive programs. Research findings in the interdisciplinary field of human-computer interaction and interactive learning concepts are applied to interface design problems. Students design, develop and evaluate a prototype interactive program. Prereq: EDC 544, EDC 547 or consent of instructor.

EDC 610 DISCIPLINE AND CLASSROOM MANAGEMENT. (3)
The course is designed to examine the causes of and solutions to disruptive and noncompliant behavior and classroom management problems that are within the control of the classroom teacher. The course content is designed around two approaches: (1) identifying prevalent problems and exploring specific solutions to them; (2) presenting selected strategies and applying them to a variety of problems. In both cases, alternatives are considered in the light of relevant theory, law, research and experience. Prereq: Teacher certification and EDU 203.

EDC 611 AUTHORING APPLICATIONS FOR TECHNOLOGY-BASED INSTRUCTION. (3)
Focuses on individual and collaborative authoring applications for technology based instructional materials. Topics include linear and non-linear information structures, instructional message design, compositional issues related to audience focus, information density, language control, and organization, and prototype production with industry standard authoring software. Prereq: EDC 547 and EDC 607 or consent of instructor.
EDC 612 INSTRUCTIONAL DESIGN AND TECHNOLOGY FOUNDATIONS. (3) Provides an in-depth survey of the field of instructional design and technology. Topics covered include the history of instructional design and technology, critical issues, current trends and future prospects for the field, instructional development, research, certification, and professional development.

EDC 615 ADVANCED INSTRUCTIONAL APPLICATIONS FOR THE EARLY ADOLESCENT LEARNER. (3) This course for middle school teachers examines the complex nature of the 10 to 14 year old student. Analysis of recent research-based effective instructional strategies to meet the needs, interests, and characteristics of these students will be included. Prereq: Teacher Certification or consent of instructor.

EDC 616 THE MIDDLE SCHOOL. (3) The purpose of this course is to provide middle school teachers with an in-depth analysis of the characteristics of effective middle school facilities. An examination of current curricular models, issues, trends, and exemplary middle schools will comprise the primary focus of this course. Prereq: EDC 615 or consent of instructor.

EDC 618 ADVANCED STUDY IN THE TEACHING OF READING. (3) An advanced course for classroom teachers which focuses on selection and implementation of reading assessment and instructional procedures. The theoretical bases of the reading process and the knowledge of research in reading will be related to the design of classroom instruction. This course is to become an option in Area 7 of both the Elementary and Secondary Standard Certification programs. Prereq: EDC 330 or 339 or 533 or equivalent.

EDC 619 ASSESSMENT OF READING GROWTH AND DEVELOPMENT. (3) Clinical techniques for the diagnosis of reading disabilities. A course designed to develop both theoretical understandings and operational skills in clinical diagnosis of reading problems. Classroom application of the techniques is discussed. Lecture, two hours, laboratory, two hours. Prereq: EDC 330 or 533, or 534 or consent of instructor.

EDC 620 DESIGN AND IMPLEMENTATION OF READING INSTRUCTION. (3) Clinical techniques used in the remediation of reading problems. A course designed to develop individualized procedures related to diagnosis. Classroom application of the instructional procedures is discussed. Lecture, two hours; laboratory, two hours. Prereq: EDC 619, or consent of instructor.

EDC 621 LINGUISTIC AND COGNITIVE FOUNDATIONS OF READING IN EARLY CHILDHOOD. (3) A study of reading as a language-based process with an emphasis upon developing observational skills to assess the child's growth in oracy and literacy skills and upon designing a language learning environment to meet these needs. Prereq: EDC 339 or permission of instructor.

EDC 631 MATHEMATICS PEDAGOGY IN THE SECONDARY SCHOOL. (0-3) Through campus and school-based experiences, students will learn how to engage young people in learning mathematics and how to make decisions about planning instruction and develop assessment based on a sound knowledge base for applying content, materials, and methods (including educational technology) appropriate for high school students. May be repeated to a maximum of three credits. Lecture, 1-3 hours; laboratory, 3-6 hours per week. Prereq: Admission to the Teacher Education Program and the M.A./M.S. in Education (Initial Certification Option-Secondary Education).

EDC 632 SOCIAL STUDIES PEDAGOGY IN THE SECONDARY SCHOOL. (0-3) Through campus and school-based experiences, students will learn how to engage young people in learning social studies and how to make decisions about planning instruction and develop assessment based on a sound knowledge base for applying content, materials, and methods (including educational technology) appropriate for high school students. May be repeated to a maximum of three credits. Lecture, 1-3 hours; laboratory, 3-6 hours per week. Prereq: Admission to the Teacher Education Program and the M.A./M.S. in Education (Initial Certification Option-Secondary Education).

EDC 633 BUSINESS PEDAGOGY IN THE SECONDARY SCHOOL. (0-3) Through campus and school-based experiences, students will learn how to engage young people in learning business and how to make decisions about planning instruction and develop assessment based on a sound knowledge base for applying content, materials, and methods (including educational technology) appropriate for high school students. May be repeated to a maximum of three credits. Lecture, 1-3 hours; laboratory, 3-6 hours per week. Prereq: Admission to the Teacher Education Program and the M.A./M.S. in Education (Initial Certification Option-Secondary Education).

EDC 634 SCIENCE PEDAGOGY IN THE SECONDARY SCHOOL. (0-3) Through campus and school-based experiences, students will learn how to engage young people in learning science and how to make decisions about planning instruction and develop assessment based on a sound knowledge base for applying content, materials, and methods (including educational technology) appropriate for high school students. May be repeated to a maximum of three credits. Lecture, 1-3 hours; laboratory, 3-6 hours per week. Prereq: Admission to the Teacher Education Program and the M.A./M.S. in Education (Initial Certification Option-Secondary Education).

EDC 635 ENGLISH PEDAGOGY IN THE SECONDARY SCHOOL. (0-3) Through campus and school-based experiences, students will learn how to engage young people in learning English and how to make decisions about planning instruction and develop assessment based on a sound knowledge base for applying content, materials, and methods (including educational technology) appropriate for high school students. May be repeated to a maximum of three credits. Lecture, 1-3 hours; laboratory, 3-6 hours per week. Prereq: Admission to the Teacher Education Program and the M.A./M.S. in Education (Initial Certification Option-Secondary Education).

EDC 636 METHODS OF TEACHING FOREIGN LANGUAGE, K-12. (3) The course provides training in teaching and managing instruction in second languages, modern and classical, grades K-12. It anticipates and integrates the objectives, content, and performance outcomes of the Field Experiences course and the Student Teaching experience. Topics include: the history and issues of foreign language education in the United States; current trends and research in language acquisition, learning, and teaching; proficiency-based models of instruction and assessment compatible with national standards and the Kentucky Education Reform framework; selection and development of instructional materials; the integration of technology; curriculum development; school reform; peer assistance, and advocacy. Prereq: Admission to the Teacher Education Program or Kentucky State Teacher Certification in Foreign Languages or in English as a Second Language.

EDC 641 RESEARCH AND THEORY IN TEACHING READING IN THE ELEMENTARY SCHOOL. (3) A systematic study of the research and theory and their application to the teaching of reading in the elementary school. Attention will be given to new developments in the field. Prereq: EDC 330 or consent of instructor.

EDC 642 RESEARCH AND THEORY IN TEACHING LANGUAGE ARTS. (3) A systematic study of research and theory in oral and written language acquisition and the implications of this knowledge for facilitating the development of listening, speaking and writing in classroom settings. The interrelationships among all of the language arts (reading, writing, listening and speaking) will be stressed. Prereq: EDC 330, or 553, or 534, or consent of instructor.

EDC 670 ADVANCED STUDY IN THE TEACHING OF ELEMENTARY SCHOOL MATHEMATICS. (3) New developments in modern elementary mathematics for teachers in the elementary schools will be reviewed. Special emphasis will be given to a study of new teaching methods, application of published research, techniques and trends in mathematics in the elementary school. Prereq: Graduate standing.

EDC 676 PRACTICUM IN GIFTED EDUCATION. (3) Supervised experience in the instruction of gifted children. Requires placement in an approved program designed for serving gifted children plus participation in a weekly supervisory seminar. Lecture, two hours; laboratory, nine hours per week. Prereq: EDP 580, EDC 602, EDP 612 or consent of instructor. (Same as EDP 676.)

EDC 710 ADVANCED TOPICS IN INSTRUCTIONAL DESIGN. (3) An identification and analysis of current theories and programs of research in instructional systems design. Students will develop the skills necessary to conduct and write a scholarly literature review and identify potential areas and questions needing further study. Prereq: EDC 608, EDP 610, EDC 612, or consent of instructor.

KEY: # = new course * = course changed † = course dropped ¶ = course removed from Bulletin due to inactivity
EDC 712 THE ELEMENTARY SCHOOL. (3) Recent research and modern trends in teaching the skills and content subjects in the elementary school. Planned for supervisors, superintendents, principals, and teachers for better understanding of a modern elementary school.

EDC 714 GUIDING AND ANALYZING EFFECTIVE TEACHING. (3) A course designed for educators who are preparing to supervise teachers and who wish to analyze their own practice. Research, policies, and trends are examined and practices analyzed in the context of how to promote effective teaching. Principles apply to elementary and secondary education.

EDC 724 GUIDING AND ANALYZING EFFECTIVE TEACHING. (3) A course designed for educators who are preparing to supervise teachers and who wish to analyze their own practice. Research, policies, and trends are examined and practices analyzed in the context of how to promote effective teaching. Principles apply to elementary and secondary education.

EDC 730 PROBLEMS OF THE SCHOOL CURRICULUM. (3) Problems in the field of the school curriculum and in the preparation of instructional materials. Students enrolling in this course are required to leave on file with the College of Education a complete report of each problem studied. May be repeated once for a maximum of six credits.

EDC 732 PRINCIPLES OF CURRICULUM CONSTRUCTION. (3) Study of basic principles of curriculum development. Relationship of social and psychological factors to curriculum change. Survey of current approaches to curriculum organization. Considerations of means of curriculum development in the instructional systems.

EDC 740 PRACTICUM IN TEACHING READING AND RELATED LANGUAGE ARTS. (3) Supervised practicum in analyzing problems in reading and related language arts and providing remedial work. Requires six hours per week in practicum with individual children or groups, plus two hours per week in seminar. May be repeated to a maximum of six credits. Prereq: EDC 619, 620.

EDC 746 SUBJECT AREA INSTRUCTION IN THE SECONDARY SCHOOL. (0-9) Students will teach in their subject areas in the schools full-time, meet regularly to discuss teaching effectiveness and strategies for improvement and develop their professional portfolios. May be repeated to a maximum of nine credits. Lecture, 3-9 hours; laboratory, 6-18 hours per week. Prereq: The appropriate methods course in the subject area (EDC 631, 632, 634 or 635). Admission to the Teacher Education Program and the M.A./M.S. in Education (Initial Certification Option-Secondary Education).

EDC 748 MASTER’S THESIS RESEARCH. (0) Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

EDC 749 DISserTATION RESEARCH. (0) Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

EDC 750 INTERNSHIP IN INSTRUCTIONAL SYSTEMS DESIGN. (3) Students will apply their knowledge of instructional systems design in a real-life setting. The work setting will be selected based on the professional goals of each student and student work will be supervised and reviewed by the internship coordinator. May be repeated to a maximum of nine credits. Prereq: Consent of program coordinator.

EDC 755 INSTRUCTIONAL SYSTEMS DESIGN RESEARCH COLLOQUIUM. (1) Students and faculty will discuss current research and related issues in instructional systems design. May be repeated to a maximum of two credits. Prereq or concur: EDC 547 and EDC 608.

EDC 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6) May be repeated to a maximum of 12 hours.

EDC 790 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE. (0-12) May be repeated indefinitely.

EDC 777 SEMINAR IN CURRICULUM AND INSTRUCTION (Subtitle required). (1-3) A critical analysis of recently developed materials and techniques in curriculum and instruction for precollege education. Includes analysis of evaluative research related to new materials and techniques. May be repeated to a maximum of nine credits. Prereq: Consent of instructor.

EDC 781 INDEPENDENT STUDY IN CURRICULUM AND INSTRUCTION. (1-3) An independent study course for graduate students who have completed at least half of the program course requirements in clinical and college teaching, curriculum and instruction, early childhood education, elementary education, reading or secondary education. May be repeated to a maximum of nine credits. Prereq: Consent of the Director of Graduate Studies.

EDC 791 RESEARCH PROBLEMS IN CURRICULUM AND INSTRUCTION. (1-3) A research problems course for graduate students who have completed at least half of the program course requirements in clinical and college teaching, curriculum and instruction, early childhood education, elementary education, reading or secondary education. May be repeated to a maximum of nine credits. Prereq: Consent of the Director of Graduate Studies.

EDP Educational and Counseling Psychology

EDP 202 HUMAN DEVELOPMENT AND LEARNING. (3) Theories and concepts of human development, learning, and motivation are presented and applied to interpreting and explaining human behavior and interaction in relation to teaching across the developmental span from early childhood to adulthood. A field experience in a school or other educational agency is a required and basic part of the course. Prereq: PSY 100.

EDP 203 TEACHING EXCEPTIONAL LEARNERS IN REGULAR CLASSROOMS. (3) An introduction to the characteristics and instructional needs of exceptional learners is presented with an overview of principles, procedures, methods, and materials for adapting educational programs to accommodate the integration of exceptional children in regular classrooms, when appropriate. A field experience in a school or other educational agency is a required and basic part of the course. Lecture, three hours per week; laboratory, two hours per week for a maximum of six weeks. Prereq: Successful completion of EDP 202 with an earned grade of C or higher.

EDP 518 MENTAL HYGIENE. (3) A general orientation to the subject of mental hygiene, its historical development, its scope and relation to various sciences. The individual and cultural determinants of behavior will be discussed. Not open to students who have had CH 520. Prereq: PSY 100 or 215, or EDP 202.

EDP 522 EDUCATIONAL TESTS AND MEASUREMENTS. (3) Problems of measurement in the school program with special emphasis on standardized tests. General principles of test construction, teacher-made tests, examinations, criteria of evaluation and marking systems.

EDP 548 EDUCATIONAL PSYCHOLOGY. (3) An introduction to the application of principles of psychology to classroom learning and teaching problems.

EDP 557 EDUCATIONAL STATISTICS. (3) A study of the applications of statistical and graphical methods to educational data. Basic descriptive statistics, correlation, the normal distribution, and hypothesis testing will be covered. Prereq: MA 109 or equivalent; undergraduate or graduate status in the College of Education; or consent of instructor.

EDP 570 INTRODUCTION TO PSYCHOLOGICAL SERVICES IN SCHOOLS. (3) A review of the historical development and models of organization and administration in the field of school psychology and the relationship between school psychology and other educational and psychological specialties. Prereq: Admission to School Psychology Program or consent of instructor.

EDP 580 INTRODUCTION TO GIFTED EDUCATION. (3) This course reviews the historical development of and the theoretical and empirical support for differentiated educational programs for gifted and talented children. Specific issues addressed include defining and identifying giftedness, teacher competencies and training, providing differentiated curricula and program evaluation. (Same as EDC 580.)
EDP 600 LIFE SPAN HUMAN DEVELOPMENT AND BEHAVIOR. (3)
A survey of human development across the life span of the individual from conception to death. Content includes changes in motor skills, biological growth and decline, learning behavior, language, social, emotional, moral, and intellectual development as well as the roles of the family, the school, peers, and work in relation to individual development. Critical evaluation of current theories which describe human development. (Same as FAM 654.)

EDP 601 HUMAN SOCIAL DEVELOPMENT. (3)
Survey of current research and theory regarding motor skills, social development, imitation, dependency, aggression, affiliation, moral development and peer group behavior. Prereq: EDP 600 or consent of instructor.

EDP 603 HUMAN COGNITIVE DEVELOPMENT. (3)
Theory and research concerning the development of attitudes, motives, self-concept and other cognitive processes are presented and the educational implications explored. Prereq: EDP 548 or EDP 610 or EDP 600.

EDP 604 LIFESPAN GENDER DEVELOPMENT. (3)
An in-depth examination of theory, research, and personal attitudes concerning gender development over the lifespan. Interaction of gender with effective personal functioning in family, educational, and work-related settings. Prereq: EDP 600 and 601 or equivalent.

EDP 605 INTRODUCTION TO COUNSELING: TECHNIQUES I. (3)
A survey of counseling psychology, philosophy, procedures and practices. Consideration of the roles of the counselor in relation to counseling services in the community and educational settings. In-depth training in initial counseling skills, interviewing (listening) and relationship building skills. Prereq: Acceptance to the graduate program in counseling psychology with the following major codes: RECO, ECGO, CPEC, ECPY, ECPC, CNPS, ESPP, ECPP, or consent of instructor via permit.

EDP 606 PROFESSIONAL ISSUES IN COUNSELING PSYCHOLOGY. (3)
A first course in the graduate curriculum in counseling psychology. Addresses professional identity, A.P.A. ethical guidelines, legal aspects of professional practice including licensing and certification, historical perspectives, training issues, and current topics of professional concern in counseling psychology. Prereq: Enrollment in a post-master’s program in counseling psychology.

EDP 610 THEORIES OF LEARNING IN EDUCATION. (3)
Consideration of the theoretical origins of learning within the context of education. Topies include major theories of learning, physiological bases for learning, relationships between learning theory and instruction, and major applications of learning theories in educational settings.

EDP 611 HUMAN COGNITIVE LEARNING. (3)
Major cognitive learning theories which explain thinking and problem-solving behavior are compared and contrasted, especially as they are applied to arrange for effective instruction. Prereq: EDP 610 or EDP 548 or PSY 507 or equivalent.

EDP 612 DEVELOPMENT OF CREATIVITY AND CRITICAL THINKING. (3)
Reviews the theoretical and empirical literature related to developing creativity and critical thinking and describes practical and effective methods of measuring and developing these cognitive abilities in gifted and nongifted students. Prereq: EDP 580 or consent of instructor.

EDP 613 SOCIAL PSYCHOLOGICAL ISSUES IN EDUCATION. (3)
This course is designed to meet the needs of graduate students in the College of Education, particularly those in educational, school, and counseling psychology, for a course in theory and principles of social psychology. While the course will survey basic concepts in social psychology, the material will be geared toward application in schools and other educational settings. For example, while the theories of attitude formation will be surveyed, principle focus will be on the measurement of attitudes in education. Further, in the study of group dynamics, applications to group learning, administrative leadership, and organizational theory will be stressed. In addition to the theories and principles of social psychology, research paradigms, social change, social influence, system consultation, and community issues as they relate to social psychological considerations will be covered. Prereq: One course in psychology or consent of instructor.

EDP 614 MOTIVATION AND LEARNING. (3)
This course will provide a review of current educational and psychological theories of motivation. After examining various theories (e.g., attributions, goals, self-efficacy, expectancy X value), the course will examine applications of these theories to contemporary issues such as violence, substance abuse, dropping out of school, health maintenance, etc.
EDP 656 METHODOLOGY OF EDUCATIONAL RESEARCH. (3)
An introduction to research methods applicable to education: the scientific method, research designs, measurement techniques, statistical analysis, and writing the research report.

EDP 658 PROBLEMS IN EDUCATIONAL PSYCHOLOGY. (1-3)
Special topics in psychological theories and research applicable to educational practices. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

EDP 659 ADVANCED EDUCATIONAL MEASUREMENT. (3)
Theory and application in educational measurement with emphasis on the appropriate selection, administration, and interpretation of standardized tests used in educational assessment. Prereq: EDP 522 or equivalent.

EDP 660 RESEARCH DESIGN AND ANALYSIS IN EDUCATION. (3)
A study of the research methodologies applicable in the several aspects of education. Emphasis is on the design of research and analysis of accumulated data. Prereq: EDP 557.

EDP 661 TECHNIQUES OF COUNSELING I. (3)
Practice in interviewing, simulated problems, observational techniques, role of the counselor. Study of films, transcripts of learning practitioners of several schools of counseling. Supervised practice with selected clients. Lecture, two hours; laboratory, two hours. Prereq: EDP 605 and consent of instructor.

EDP 664 PRE-MASTERS PRACTICUM IN COUNSELING PSYCHOLOGY. (1-6)
Supervised experience in application of diagnostic and interviewing techniques in a counseling service. May be repeated to a maximum of twelve credits. Lecture, three hours; laboratory, eight hours per three credit hours. Prereq: EDP 652 and EDP 661 and Master's candidacy in counseling and approval of departmental counseling committee.

EDP 665 POST-MASTERS PRACTICUM IN COUNSELING PSYCHOLOGY. (1-6)
Supervised experience in application of diagnostic and interviewing techniques in a counseling service. Prereq: A Master's degree in Counseling Psychology or equivalent, approval of departmental counseling committee and EDP 661.

EDP 666 PSYCHOLOGY OF CAREER COUNSELING. (3)

EDP 669 Diagnostic Classification in School Psychology. (3)
Review of theory and research related to individual differences in physical, intellectual, social, and emotional development of preschool and school-aged children and adolescents. Compares psychological and educational approaches to diagnostic classification of such differences. Prereq: PSY 533 or consent of instructor.

EDP 670 Psychoeducational Strategies of Intervention. (3)
A general review of and development of basic competence in the major intervention strategies applicable to the amelioration of children's common learning and adjustment difficulties in the school setting. Prereq: EDP 640, EDP 669 and Admission to School Psychology Program.

EDP 671 Seminar in Psychoeducational Consultation in Schools. (3)
A study of the rationale and techniques used in consultation with teachers, parents, administrators and other school personnel for the purpose of both preventing and alleviating the learning and adjustment difficulties of individual or groups of school-aged children. Prereq: Admission to School Psychology Program, advanced standing in a professional educational program or permission of the instructor.

EDP 675 PRACTICUM IN SCHOOL PSYCHOLOGY. (1-6)
Supervised experience in the application of psychoeducational, diagnostic assessment, intervention, and consultation services in a clinic, school, or community setting. Requires three hours of on-site activities per credit hour and weekly supervision meetings. May be repeated to a maximum of 18 credits. Prereq: Admission to the School Psychology Program and consent of instructor.

EDP 676 PRACTICUM IN GIFTED EDUCATION. (3)
Supervised experience in the instruction of gifted children. Requires placement in an approved program designed for serving gifted children plus participation in a weekly supervisory seminar. Lecture, two hours; laboratory, nine hours per week. Prereq: EDP 580, EDC 602, EDP 612 or consent of instructor. (Same as EDC 676.)
EDP 769 RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE. (0-12) May be repeated indefinitely.

EDP 776 SEMINAR IN SCHOOL PSYCHOLOGY (Subtitle required). (3) Topical consideration of philosophical, technical, professional and theoretical positions in school psychology theory and practice. May be repeated to a maximum of nine credits under different subtitles. Prereq: Graduate standing in School Psychology or consent of instructor.

EDP 777 SEMINAR IN COUNSELING PSYCHOLOGY. (1-3) Topical consideration of philosophical, technical and theoretical positions in counseling theory and practice. May be repeated to a maximum of six credits. Prereq: Doctoral standing, EDP 665, or consent of instructor.

EDP 778 SEMINAR IN EDUCATIONAL PSYCHOLOGY (Subtitle required). (3) Intensive study of selected topics in human learning and development. Particular emphasis on research topics. Students will design sample studies in their areas of interest. May be repeated to a maximum of nine credits under different subtitles. Prereq: Doctoral standing in the College of Education or consent of instructor.

EDP 782 INDEPENDENT STUDY IN EDUCATIONAL PSYCHOLOGY. (1-3) Independent study course for advanced graduate students who desire to investigate special problems and conduct research in educational psychology. May be repeated to a maximum of twelve credits. Prereq: One year of graduate work in educational psychology and consent of instructor.

EDS 357 INITIAL PRACTICUM IN SPECIAL EDUCATION. (1) An introductory supervised field experience for special education majors. Students will participate in two special education programs as teacher aids. Placements will include public schools and other agencies serving children with disabilities. May be repeated to a maximum of three credits. Lecture, one hour; field experience, three hours per week. Prereq or concurrent: EDS 375.

EDS 375 INTRODUCTION TO EDUCATION OF EXCEPTIONAL CHILDREN. (3) An introduction to various contemporary areas of special education. Topics include special education diagnostic categories, programming, service delivery models, career education, child advocacy and litigation affecting public education for students with disabilities.

EDS 395 INDEPENDENT STUDY IN SPECIAL EDUCATION. (1-6) An independent study course for undergraduate students with an interest in a specific problem in special education. Offered by appointment.

EDS 459 STUDENT TEACHING IN SPECIAL EDUCATION. (3-12) Supervised student teaching experience utilizing the special techniques used in working with individuals with exceptional educational problems such as speech handicaps, physical handicaps, visual impairments, hearing disabilities, neurological impairments (learning disabilities), mental retardation, and the gifted. To be offered only on a pass-fail basis. Prereq: Must complete the published College requirements for admission to student teaching; admission to the Teacher Education Program or permission of instructor.

EDS 510 EARLY CHILDHOOD SPECIAL EDUCATION. (3) An overview of the field of early childhood special education including discussions of historical and empirical support for providing early intervention services, screening, assessment, instructional programming, integration of children with and without disabilities, family involvement, and service delivery models. Emphasis is placed on assessing and promoting attainment of cognitive, language, social, self-help, and motor skills. Prereq: EDS 375 or EDP 203 or consent of instructor.

EDS 511 SPEECH-LANGUAGE DEVELOPMENT AND DISORDERS FOR THE SEVERELY HANDICAPPED. (3) An introduction to communication development and intervention for language disordered individuals whose language age is at or below four years, including cognitive, social, auditory, visual, and motor components. Topics include prerequisites for language, normal communication development, evaluation of language functioning, and approaches to altering communication behavior. Prereq: CD 277 or EDS 375 or consent of instructor. (Same as CD 511).

EDS 512 SPEECH-LANGUAGE DEVELOPMENT AND DISORDERS FOR THE MILDLY HANDICAPPED. (3) An introduction to the characteristics of receptive and expressive language disorders in language-disordered children whose language age is four years or higher, including auditory, visual, cognitive, and motor components. Topics include language development, language disorders, language evaluation, and techniques for receptive and expressive language stimulation. Prereq: CD 277 or EDS 375 or permission of instructor. (Same as CD 512).

EDS 513 LEGAL ISSUES IN SPECIAL EDUCATION. (3) A review of pertinent legislation concerning human and constitutional rights related to persons with disabilities. Teachers’ specific responsibilities and liabilities are described and related to current requirements for development of appropriate educational programs. Emphasis is given to how, through active parent participation, teachers can facilitate each student’s developmental progress. Prereq: EDS 375 or consent of instructor.

EDS 514 INSTRUCTIONAL TECHNOLOGY IN SPECIAL EDUCATION. (3) An overview of ways technology can be used to facilitate the education of students with disabilities. Topics include personal computer operation, personal productivity tools, instructional software evaluation and integration into the curriculum, multimedia applications, telecommunication, and emerging technologies. Lecture, three hours; laboratory, two hours per week. Prereq: EDS 375 or EDP 203.

EDS 516 PRINCIPLES OF BEHAVIOR MANAGEMENT AND INSTRUCTION. (3) Basic principles of applied behavior analysis and modification which employ social learning theory and contingent conditioning models are taught. Emphasis is placed on designing individualized learning environments, selecting and implementing behavior management strategies, writing behavior objectives, and performing task analyses. Prereq: EDS 375 or permission of instructor.

EDS 517 ASSISTIVE TECHNOLOGY IN SPECIAL EDUCATION. (3) A general introduction to the theory, need, and use of assistive devices in the classroom. Review of physical disabilities and basic operation, maintenance, and trouble shooting techniques will be presented. Service personnel typically associated with training in the use of assistive devices will be discussed. Students will be required to simulate a disability and use an assistive device. Prereq: EDS 375 or permission of instructor.

EDS 529 EDUCATIONAL PROGRAMMING FOR STUDENTS WITH MILD DISABILITIES. (3) Procedures for administering formal and informal tests to determine specific educationally relevant strengths and deficits of children with learning and behavior disorders. The characteristics of children with learning and behavior disorders are surveyed, as they relate to special education programming. Lecture, three hours; field experience, two hours. Prereq: EDS 375, EDS 516 and admission to the Teacher Education Program; or consent of instructor.

EDS 529 EDUCATIONAL PROGRAMMING FOR STUDENTS WITH MILD DISABILITIES. (3) Design, implementation, and evaluation of individualized programs based on the educationally relevant characteristics of children with mild disabilities. Includes educational assessment and programming in reading, math, and language. Prereq: Admission to the Teacher Education Program, EDC 329, EDS 513, and 516, or consent of instructor; or prereq or concur: EDS 528.

EDS 530 MODERATE AND SEVERE DISABILITIES. (3) Special education issues with individuals exhibiting moderate to severe intellectual and developmental disabilities. A critical examination of contemporary research with regard to the educational, behavioral, developmental issues of individuals exhibiting moderate to severe intellectual and developmental disabilities will be addressed. Lecture, three hours; field experience, three hours.

EDS 546 TRANSDISCIPLINARY SERVICES FOR STUDENTS WITH MULTIPLE DISABILITIES. (3) This course will focus on the philosophical issues related to teaching students with deaf-blindness and other multiple disabilities. Professionals will discuss pertinent information related to planning for this population of students, particularly in the areas of communication, physical management, health, sensory input, and vitality. Students will utilize information obtained to plan for a student with deaf-blindness or other multiple disabilities. Strategies presented for planning will include transdisciplinary assessment, person-centered planning, and activity-based instruction. Prereq: EDS 375 or EDS 600 or consent of instructor. (Same as RC 546.)
EDS 547 COLLABORATION AND INCLUSION IN SCHOOL AND COMMUNITY SETTINGS. (3)
This course will focus on inclusion of students with moderate to severe disabilities in all aspects of school and community life, with special consideration given to the individual student planning variables that must be addressed in meeting the needs of each school-age student and for preparing students to function as fully and independently in their communities as possible. The course is designed to meet the needs of those pursuing certification in Moderate and Severe Disabilities and pursuing degrees in Elementary and Secondary Education, Vocational Rehabilitation, School Psychology, Social Work, Physical Therapy, Communication Disorders, and related disciplines. Prereq: Consent of instructor. (Same as RC 547.)

EDS 548 CURRICULUM DESIGN FOR STUDENTS WITH MODERATE AND SEVERE DISABILITIES. (3)
Educational and adaptive behavior assessment and curriculum prescription for individuals exhibiting moderate intellectual and development disabilities. The course participant will acquire skills in the use of current formal and informal educational and adaptive behavior assessment procedures for use in prescribing curriculum, instructional, behavioral intervention with individuals exhibiting moderate intellectual and developmental disabilities. Specific attention will be focused on procedures for using assessment data and curriculum prescription that enhances the full inclusion of school-age individuals with disabilities with their non-disabled peers. Lecture, three hours; field experience, four to six hours per week. Prereq: EDS 516, 530, or consent of instructor.

EDS 549 METHODS FOR STUDENTS WITH MODERATE AND SEVERE DISABILITIES. (4)
The course participant will serve as a teacher aide in a classroom or other service delivery setting under the supervision of a person certified to teach students with moderate to severe disabilities. Course requirements include application of direct observation, formal and informal assessment of pupil performance, clinical writing and instructional and behavioral intervention in both individualized and small group settings. Practicum settings used by course participants will model best practices with regard to instruction, behavior management, and the full inclusion of persons with moderate to severe disabilities with their non-disabled peers. Lecture, two hours; field experience, six to eight hours per week. Prereq: Admission to the Teacher Education Program, EDS 516, 548, or consent of instructor.

EDS 550 STUDENT TEACHING: MODERATE/SEVERE DISABILITIES. (6-12)
Student teaching in the low-incidence disabilities classroom. Supervised student teaching in a classroom for students identified as having moderate to severe disabilities. To be offered on a letter grade basis only. Prereq: Must complete the published College requirement for admission to student teaching, including admission to the Teacher Education program; or consent of instructor.

EDS 556 ISSUES IN SPECIAL EDUCATION. (1-9)
In-depth study of a current and topical problem or issue in the education of exceptional children and youth. May be repeated to a maximum of nine credits. A title is assigned each time the course is offered. (Same as RC 558.)

EDS 570 EMOTIONAL AND BEHAVIORAL DISABILITIES. (3)
The emotional and behavioral problems of exceptional children and youth are considered in the context of normal child development. A survey of the major categories of emotional and behavioral disabilities includes identification, description, and etiology, with material drawn from clinical, theoretical, and research sources. Approaches to remediation cover both community resources and the roles of various professional personnel. Prereq: EDS 375 or equivalent.

EDS 589 FIELD EXPERIENCES: MILD DISABILITIES. (3)
Supervised pre-student teaching experiences with children having learning and behavioral disabilities, including practica experience with public school students in at least two different special education sites. Approximately two hours lecture-discussion and two three-hour observations and/or practica per week. Prereq: EDS 513, 516, admission to the Teacher Education Program; or consent of instructor. Prereq, or concurrent EDS 528. Must take EDS 529 concurrently. Must not take concurrently with the Middle School methods block (EDS 330, EDS 343, and two methods classes).

EDS 600 SURVEY OF SPECIAL EDUCATION. (3)
A survey of current status of the field of special education. Emphasis is on analysis of the major research literature pertaining to exceptional children and their education. Prereq: Graduate standing.

EDS 601 APPLIED BEHAVIORAL ANALYSIS. (3)
The focus of this course is on the technology of applied behavior analysis, including the functional analysis of children’s behavior and the development, implementation, evaluation of behavior management programs with children and youth. Prereq: Completion of EDS 516 equivalent, or with a grade of “B” or better.

EDS 602 ADMINISTRATION AND PROGRAMS IN SPECIAL EDUCATION. (3)
The organization, management and supervision of programs for exceptional children at the local, state and national levels. Roles and functions of the special education administrator are considered. Experiences drawn from special residential, private and public day schools are studied. Prereq: Certification in special education; six hours of course work in educational administration and supervision.

EDS 603 BEHAVIORAL CONSULTATION IN THE SCHOOLS. (3)
Principles and techniques of behavioral consulting with classroom teachers and other school personnel, with particular focus on supporting handicapped children in mainstream education programs. The consultant’s role in providing indirect service to children, through in-service teacher training and consultation, is emphasized. Lecture, two hours; laboratory, two hours. Prereq: EDS 601, or equivalent; EDP 671 (may be taken concurrently); or permission of instructor.

EDS 610 ADVANCED EDUCATIONAL ASSESSMENT FOR STUDENTS WITH MILD DISABILITIES. (3)
An intensive study of, and laboratory experience in, the assessment of educational problems of children with mild disabilities. Special emphasis is given to the relationship of physical, intellectual, emotional and behavioral disabilities to performance in the individual or group setting. Lecture, two hours; laboratory, two hours. Prereq: EDS 528 or consent of instructor.

EDS 611 ADVANCED EDUCATIONAL PROGRAMMING FOR STUDENTS WITH LEARNING DISABILITIES. (3)
An in-depth study of learning disabilities, including characteristics, issues, and research-based interventions for academic and social behaviors. Prereq: EDS 529 and EDS 610 or equivalents, or consent of instructor.

EDS 612 ADVANCED PRACTICUM: SPECIAL EDUCATION. (3-6)
Intensive clinical experience with exceptional children in day and residential schools, hospitals and private agencies. Students engage in prescriptive teaching with persons with disabilities in individualized, small group and special class settings. Laboratory, 6-12 hours per week. Prereq: Graduate standing; major in special education.

EDS 616 VOCATIONAL PROGRAMMING FOR HANDICAPPED YOUTH AND ADULTS. (3)
Conceptualization and delineation of vocational programming for handicapped individuals, vocational evaluation, training and program models are emphasized. Prereq: Permission of instructor.

EDS 620 INSTRUCTIONAL PROGRAMMING AND ASSESSMENT IN EARLY CHILDHOOD SPECIAL EDUCATION. (3)
An in-depth study of the rationale and research history of the early education of exceptional children. A wide variety of assessment tools commonly used in the education of young children with disabilities will be presented, used and discussed. Individualized program planning based on test results and techniques for working with groups of exceptional children will be presented, implemented and discussed. Prereq: EDS 375 or 600 and EDS 510 or equivalent or permission of instructor.

EDS 621 ISSUES IN EARLY CHILDHOOD EDUCATION OF THE HANDICAPPED. (3)
Students will review, discuss and participate in supervised practicum experiences related to the preparation of special education teachers. Field work will include observation of sites of regular and special preschool programs, infant intervention programs, interdisciplinary child evaluation and demonstration of instructional methods and materials. Lecture: one hour; laboratory: two hours. Prereq: Admission to Master’s Program in Special Education or permission of instructor and EDS 620.

EDS 622 THE FAMILY’S ROLE IN EARLY CHILDHOOD EDUCATION. (3)
The purpose of this course is to provide students with information related to working with young children and with and without disabilities and their families. This course will focus both on presenting new information and providing opportunities for students to practice skills necessary for working with families. (Same as FAM 622.)

EDS 623 ADVANCED PRACTICUM: EARLY CHILDHOOD SPECIAL EDUCATION. (3-9)
This course will provide supervised field experience in preparation of teachers or supervisors in early childhood special education. May be repeated to a maximum of nine credit hours. Laboratory, nine clock hours per credit hour. Prereq: Admission to Master’s program in Special Education, or permission of instructor.
EDS 630 METHODS FOR TEACHING STUDENTS WITH DISABILITIES. (3)
An intensive study of the principles and procedures used in programming learning activities for students with disabilities. Topical areas include the acquisition of stimulus control and programming for generalization and maintenance of induced behavior change. Lecture, three hours. Prereq: EDS 601 and consent of instructor.

EDS 631 PROGRAMMING FOR STUDENTS WITH MODERATE AND SEVERE DISABILITIES. (3)
Intensive review of instructional programs designed for use with students with moderate and severe disabilities. Emphasis is on assessment of and developing learning activities/sequences for students with moderate and severe disabilities. Lecture, three hours. Prereq: Consent of instructor.

EDS 632 ADVANCED PRACTICUM: MODERATE AND SEVERE DISABILITIES. (1-12)
Intensive educational experience with students with moderate and severe disabilities in educational, residential and hospital settings. Site and practicum responsibilities will be based on students’ competencies and area of interest. May be repeated to a maximum of 21 credits. Prereq: Graduate standing and consent of instructor.

EDS 633 SINGLE SUBJECT RESEARCH DESIGN. (3)
Principles and methods in designing Single Subject Research in educational settings. Students will be required to design and defend a research proposal. Prereq: EDS 601 or 630 or consent of instructor.

EDS 640 ASSISTIVE TECHNOLOGY. (3)
An introduction to the techniques and devices which assist individuals with disabilities in performing functional tasks and achieving increased independence. Emphasis is placed on the functional use of technology by persons with disabilities and the integration of assistive technology into the home, community, school, and workplace. Topics include the transdisciplinary approach to service delivery, toy adaptation, switch construction and use, environmental control, alternate computer access, curricular adaptations, and augmentative communication. Prereq: EDS 514 and EDS 600, or permission of instructor.

EDS 641 ASSISTIVE TECHNOLOGY ASSESSMENT. (3)
A study of procedures for conducting assessments that will result in the selection and use of assistive technologies that people with disabilities can use to improve their ability to function in the environment. Topics will include the use of assessment models and protocols, environmental adaptations, assistive technology resources, preparation of assessment reports, team decision making, and evaluation of assistive technology use. Students will engage in assistive technology assessment observations, role play, authentic assessments, and interdisciplinary collaboration. Prereq: EDS 514 and EDS 600, or permission of instructor.

EDS 643 TELECOMMUNICATION IN SPECIAL EDUCATION AND REHABILITATION. (3)
A study of telecommunication systems and their implications for special education and rehabilitation. Students will learn how to set up and configure hardware and software for telecommunication access, use software to telecommunicate, access special education and rehabilitation resources from remote sites, and design telecommunication applications for individuals who are enrolled in special education or rehabilitation programs. Students will also learn how to develop and use World Wide Web pages that focus on special education or rehabilitation topics. Prereq: EDS 514 and EDS 600, or permission of instructor.

EDS 645 HYPERMEDIA DEVELOPMENT FOR SPECIAL EDUCATION. (3)
Students will study ways that hypermedia can be developed for use in special education programs. Topics will include hypermedia concepts, principles of designing visual displays, computer painting programs, computer-human interface guidelines, integration of CD-ROM and videodisc technology, digital scanning of images, sound synthesis and digitizing, use of digital movies and developing audio and visual special effects. Special emphasis will be devoted to the development of computer scripts for controlling the presentation of hypermedia programs. Prereq: EDS 514 and EDS 600, or permission of instructor.

EDS 647 SEMINAR IN SPECIAL EDUCATION TECHNOLOGY (Variable topic). (1-3)
A topical seminar on technology applications in special education. Seminars will address different topics of timely interest, current issues, and various approaches to providing assistive technology and instructional technology services for people with disabilities. Prereq: EDS 514 and EDS 600, or permission of instructor.

EDS 648 COORDINATING SPECIAL EDUCATION TECHNOLOGY PROGRAMS. (3)
Students will study procedures for planning and implementing special education technology programs in schools. Topics will include use of planning models, philosophy and mission development, generating program goals and objectives, procedures for preparing strategic plans, establishing policies and procedures, identifying resource requirements, managing program implementation, evaluation of program effectiveness, and preparation of proposals for funding. Prereq: Six credits of prior technology coursework or permission of instructor.

EDS 649 ADVANCED PRACTICUM: SPECIAL EDUCATION TECHNOLOGY. (1-9)
Students will engage in supervised practicum activities associated with the delivery of technology services to individuals with disabilities. Practicum settings may include schools, rehabilitation agencies, clinics, hospitals, technology resource centers, administrative offices, and other facilities involved in the development or delivery of technology services. May be repeated to a maximum of nine credits. Prereq: EDS 514 and EDS 600, or permission of instructor.

EDS 701 SEMINAR FOR SPECIAL EDUCATION LEADERSHIP PERSONNEL. (1)
Study of issues and topics affecting the preparation of special education personnel and of research issues involving persons with disabilities and educational programs. May be repeated to a maximum of six credits. Lecture, two hours per week. Prereq: Admission into the Ed.S. or Ed.D. program.

EDS 710 SEMINAR IN MILD DISABILITIES. (3)
Advanced study of issues related to mild disabilities in children, including etiology, assessment, intervention, theories, and contemporary research findings. Prereq: Admission to Ed.S. or Ed.D. program in Special Education or consent of instructor.

EDS 711 SEMINAR IN MODERATE AND SEVERE DISABILITIES. (3)
Advanced study of issues related to moderate and severe disabilities, including problems of identification and assessment, program alternatives, curricula, theories, and contemporary research findings. Prereq: Admission to Ed.S. or Ed.D. program in Special Education or consent of instructor.

EDS 712 SEMINAR IN SPECIAL EDUCATION PROFESSIONAL SERVICES. (3)
Study of procedures for providing special education professional services including consultation, technical assistance, continuing education programs, professional organization development, committee and advisory board involvement, professional writing and editing, leadership training, and funding proposal development. Prereq: Admission to the Ed.S. or Ed.D. program in special education or consent of instructor.

EDS 720 SEMINAR IN SPECIAL EDUCATION TEACHER PREPARATION. (3)
Study of the design and implementation of special education teacher preparation programs, including syllabus development, organization of class presentations, instructional alternatives, scheduling, student assessment, professor-student interactions, student advising, resource identification and utilization and program evaluation. Prereq: Admission to the Ed.S. or Ed.D. program in special education or consent of instructor.

EDS 721 PRACTICUM IN SPECIAL EDUCATION PERSONNEL PREPARATION. (1-9)
Supervised practicum experiences related to the preparation of special education teachers, including practice in delivering lectures, conducting class discussions, leading seminars, directing independent studies, guiding student research projects, demonstrating instructional methods and materials, supervising special education student teachers and advising. Laboratory, three-nine hours. May be repeated to a maximum of nine credits. Prereq: Admission to the Ed.S. or Ed.D. program in special education or consent of instructor.

EDS 730 SEMINAR IN SPECIAL EDUCATION ADMINISTRATION. (3)
Administration of special education programs at the local and state levels. Emphasis is on program planning, staffing, fiscal management and program evaluation. Prereq: EDS 602 and admission to the Ed.S. or Ed.D. program in special education or consent of instructor.
EDS 731 ADVANCED PRACTICUM: SPECIAL EDUCATION ADMINISTRATION. (1-9) Supervised practicum experiences related to the administration of special education programs at the local and state levels, and project management, including staff management and development, program planning, evaluation, fiscal management, organization, reporting, communications, and coordination. Laboratory, three-nine hours. May be repeated to a maximum of nine credits. Prereq: Admission to the Ed.S. or Ed.D. program in special education administration or in certification program for special education administrators.

EDS 748 MASTER'S THESIS RESEARCH. (0) Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

EDS 749 DISSERTATION RESEARCH. (0) Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

EDS 768 RESIDENCE CREDIT FOR THE MASTER'S DEGREE. (1-6) May be repeated to a maximum of 12 hours.

EDS 769 RESIDENCE FOR THE DOCTORAL DEGREE. (0-12) May be repeated indefinitely.

EDS 779 SEMINAR IN SPECIAL EDUCATION (Variable topic). (1-3) Study of philosophy, principles, trends and research in education of exceptional children. Students will carry on an extensive study of a problem dealing with education of the exceptional child. May be repeated to a maximum of nine credits.

EDS 789 INDEPENDENT STUDY IN SPECIAL EDUCATION. (1-6) An independent study course for advanced graduate students with an interest in a specific problem in special education. Class hours by appointment. Prereq: Minimum of 12 semester hours in graduate work and consent of instructor.

EDS 799 RESEARCH TECHNIQUES IN SPECIAL EDUCATION. (1) A study of the basic research techniques and their application to special education. Unique problems in special education will be discussed with emphasis on designing and conducting a research study. Computer usage will be discussed and students encouraged to use the computer as a research tool. May be repeated to a maximum of three credits. Prereq: Twelve graduate semester hours in special education including EDP 657 or equivalent.

EDU 300 SPECIAL COURSE. (1-3) This course is being proposed to provide an opportunity for offering experimental, topical or interdisciplinary courses on a one-time or two-time basis without creating a permanent course. The description will be submitted each time the course is offered. Prereq: Permission of instructor.

EDU 305 CONTEMPORARY ISSUES FACING THE AT-RISK SCHOOL-AGE/adolescent child. (3) To provide background information, experience, and skills for undergraduate students to interact with elementary and middle school children in a consulting role. Special emphasis will address the needs of the “at-risk” student population. The “at-risk” student is associated with families with incomes below the poverty level, as well as other significant problems which plague contemporary society – e.g., homelessness, child abuse/neglect, single parent homes, non-English speaking parents, fetal alcohol or substance abuse syndrome, mentally and/or physically handicapped parents or siblings, and high incidence of academic achievement declines and dropout rates. Lecture, two hours; laboratory, two hours per week. Prereq: Consent of instructor.

EDU 645 FOUNDATIONS OF PEDAGOGICAL THEORY AND PRACTICE IN THE SECONDARY SCHOOL. (0-9) Students will participate with other secondary education majors in a variety of disciplines in the reflective study of adolescent behavior, secondary school curriculum, school law, learning theory, learning styles, effective teaching and learning, instructional technology, working with special populations, cultural diversity in the schools, school context, and professional development. Students will spend time in the schools applying concepts. May be repeated to a maximum of nine credits. Lecture, 3-9 hours; laboratory, 6-18 hours per week. Prereq: Admission to the Teacher Education Program and the M.A./M.S. in Education (Initial Certification Option-Secondary Education).

EDU 745 INTERDISCIPLINARY INSTRUCTION IN THE SECONDARY SCHOOL. (0-3) Students will participate with other secondary education majors from a variety of disciplines in the reflective study of the context of schooling, classroom management, individual student differences, and professional development. Students will be in the schools applying concepts on a full-time basis. May be repeated to a maximum of three credits. Lecture, 1-3 hours; laboratory, 3-6 hours per week. Prereq: Admission to the Teacher Education Program and the M.A./M.S. in Education (Initial Certification Option-Secondary Education).

EDV Education – Vocational

AGRICULTURAL EDUCATION

EDV 211 INTRODUCTION TO TRAINING AND DEVELOPMENT. (3) An orientation to the field of training and development from the human resource management perspective. Visits to organizations with training programs and supervised “shadowing (field experience)” experiences required.

EDV 301 PLANNING, DESIGN, AND EVALUATION OF VOCATIONAL TRAINING. (3) To provide the student with a practical introduction to the major function of the training professional; planning, designing, and evaluating training programs for the workplace. Prereq: EDV 211.

EDV 370 STUDENT TEACHING IN VOCATIONAL AGRICULTURE. (9) Practical application of methods in teaching various phases of vocational agriculture. To be taken concurrently with EDV 580, 581 and 583. Laboratory, 20 hours. Offered on a pass-fail basis only. Prereq: Second semester senior; admission to the Teacher Education Program or permission of instructor.

EDV 580 MATERIALS AND METHODS FOR TEACHING VOCATIONAL AGRICULTURE. (3) Designed to develop teacher competency in methods of teaching with emphasis on the problem-solving procedure and use of demonstrations, field trips, and audiovisual materials. Evaluation of teaching-learning is emphasized. A study of facilities and instructional materials needed by a department of vocational agriculture is made. Prereq: Admission to the Teacher Education Program or permission of instructor.

EDV 583 EXPERIENCE PROGRAMS IN VOCATIONAL AGRICULTURE. (3) Designed to develop teacher competencies to guide students to select, plan, carry out, and evaluate supervised experience programs in vocational agriculture, both production and off-farm. Prereq: Second semester senior; admission to the Teacher Education Program or permission of instructor.

BUSINESS EDUCATION

EDV 615 PROBLEMS IN BUSINESS EDUCATION. (3) A study of advanced problems of interest to business teachers such as testing in business subjects, guidance, job studies, placement and follow-up, equipment, and supervision. May be repeated three times for a maximum of 12 credits.

EDV 626 CLASSIFICATION AND POSSIBLE USE OF COMMUNITY RESOURCES IN BUSINESS EDUCATION. (3) Course provides for community analysis, and the development of possible ways and means to supplement the business education course in the secondary school with a study of vital community resources.

DISTRIBUTIVE EDUCATION

EDV 517 DETERMINING TEACHING CONTENT IN MARKETING AND DISTRIBUTIVE EDUCATION. (2-3) Course construction in the field of marketing education. This course is planned to meet the needs of persons engaged as instructors in the field of marketing education. May be repeated to a maximum of six credits.

EDV 528 TECHNIQUES OF TEACHING MARKETING AND DISTRIBUTIVE EDUCATION. (2-3) A study of the methods of teaching as applied to marketing education. The purpose of the course is to train prospective teachers to teach in the field of marketing education. May be repeated to a maximum of six credits.
EDV 365 STUDENT TEACHING IN HOME ECONOMICS. (3-12)
Practical application of methods in teaching various phases of home economics. Offered on a pass-fail basis only. Prereq: EDV 596; admission to the Teacher Education Program or permission of instructor.

EDV 109 INSTRUCTIONAL MATERIAL IN INDUSTRIAL EDUCATION. (2-3)
Components of a comprehensive course of study are identified and students engage in the validation and preparation of materials to be used in teaching. Emphasis is placed on planning and preparing those materials that individualize instruction in the vocational industrial course.

EDV 110 PRINCIPLES OF INDUSTRIAL TEACHING. (2-3)
Designed for the beginning vocational industrial teacher. Study is made of various accepted teaching procedures and class managerial activities with which the new shop teacher must be familiar.

EDV 211 INTRODUCTION TO TRAINING AND DEVELOPMENT. (3)
An orientation to the field of training and development from the human resource management perspective. Visits to organizations with training programs and supervised "shadowing (field experiences)" required.

EDV 501 PRACTICUM IN VOCATIONAL EDUCATION. (1-12)
Planned and supervised practicum in teaching agriculture, business, home economics and vocational education at middle and high school levels. Requires the integration of observation skills, application of instructional objectives, teaching strategies, selection of instructional materials, assessment of student progress, and use of student organizations. Regularly scheduled seminars included as an integral part of course. Open only to students in the master's degree combined with initial teaching certification program. May be repeated to a maximum of 12 credits. Prereq: Consent of instructor.

EDV 516 PROBLEMS OF THE COORDINATOR IN VOCATIONAL EDUCATION. (2-3)
A course to prepare coordinators of vocational education programs, including planning of local or area programs, use of advisory committees, selection of instructional materials and equipment, organizing instructional programs, and overall planning and operating of the program. May be repeated to a maximum of six credits.

EDV 520 THE ADULT LEARNER IN VOCATIONAL SETTINGS. (3)
An overview of adult education practices and their relevance to adult learning in the work setting. Prereq: EDV 211 or consent of instructor.

EDV 535 PRINCIPLES AND PHILOSOPHY OF VOCATIONAL EDUCATION. (2-3)
Study is made of philosophy, accepted principles, and legislation affecting programs in vocational education. May be repeated to a maximum of six credits.

EDV 702 CAREER DEVELOPMENT: RESEARCH, THEORIES AND PRACTICES. (2-3)
Overview of theories of career development and current research. Emphasis on use of vocational assessment techniques in counseling and decision-making. (Same as EDP 702.)

EDV 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

EE 101 ELECTRICAL ENGINEERING PROFESSIONS SEMINAR. (1)
Introductory seminar on professional practice, growth, conduct and ethics. Presentations on computers in electrical engineering and the University computer system. Presentations from career engineers and professional societies and reading assignments in professional journals. Pass/fail only.

EE 211 CIRCUITS I. (4)
Fundamental laws and principles for linear circuits whose elements consist of passive and active components used in present day engineering practice. Determination of the sinusoidal steady state responses using the algebra of complex numbers. Lecture, three hours; recitation-laboratory demonstration, one two-hour session. Prereq: MA 114; prereq, or concur: PHY 232, 242.

EE 221 CIRCUITS II. (3)

EE 222 ELECTRICAL ENGINEERING LABORATORY I. (2)
Laboratory exercises in the use of measuring instruments. Experiments in R-L-C circuit analysis. Lecture, one hour; laboratory, three hours. Prereq or concur: EE 221.

EE 280 DESIGN OF LOGIC CIRCUITS. (3)
Boolean algebra; combinational logic circuits; synchronous sequential circuits; asynchronous sequential circuits; design problems using standard integrated circuits. Prereq: CS 115.

EE 305 ELECTRICAL CIRCUITS AND ELECTRONICS. (3)
A study of DC and AC electrical circuits, electronics principles and applications to instrumentation. Prereq: PHY 232, MA 114.

EE 306 ELECTRICAL CIRCUITS AND MACHINERY. (3)
A study of AC and DC electrical circuits, single and three-phase systems, AC and DC machines and their control. Prereq: MA 114, PHY 232.

EE 307 CIRCUIT ANALYSIS WITH APPLICATIONS. (4)
A service course covering electrical engineering principles for engineering or science students with majors outside of electrical engineering. Topics include circuit analysis, applications to electromechanical machines and analog and digital electronics. Not available to electrical engineering majors. Prereq: PHY 232.

EE 380 MICROCOMPUTER ORGANIZATION. (3)
Hardware and software organization of a typical computer; machine language and assembler language programming, interfacing peripheral devices, and input-output programming; real-time computer applications, laboratory included. Prereq: EE 280 or CS 245. (Same as CS 380.)

EE 395 INDEPENDENT WORK IN ELECTRICAL ENGINEERING. (1-6)
Special research and problems for individual students who are capable of pursuing independent investigations. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

EE 402G ELECTRONIC INSTRUMENTATION AND MEASUREMENTS. (3)
Elementary treatment of electronic circuits emphasizing laboratory work. Topics include AC circuits, filters, theory and operation of transistors and other semiconductor devices and a simple treatment of operational amplifiers. Lecture, two hours per week; laboratory, three hours per week. Prereq: PHY 242 or EE 305 or consent of instructor. (Same as PHY 402G.)

EE 415G ELECTROMECHANICS. (3)
Study of electric machines and electromechanical systems. Prereq: EE 221 with a C or better and PHY 232.

EE 416G ENERGY CONVERSION LABORATORY. (2)
Laboratory practice and experimental studies related to EE 415G. Lecture one hour; laboratory, three hours. Prereq or concur: EE 415G.

EE 421G SIGNALS AND SYSTEMS I. (3)
An introduction to the modeling and analysis of signals and systems. Topics include convolution, Fourier series, Fourier Transform bandwidth, basic filter design, modulation techniques, random variables and random processes and spectral density. Prereq: MA 214 and a "C" or better in EE 221.

EE 422G SIGNALS AND SYSTEMS II. (3)
A continuation of the analysis of signals and linear systems with an emphasis on feedback and discrete-time systems. Topics include the Laplace and Z-transforms, frequency domain modeling techniques, feedback principles, state variables, sampling and digital filter design. Prereq: EE 421G, engineering standing.

EE 461G INTRODUCTION TO ELECTRONICS. (3)
Analysis and design of electronic circuitry incorporating nonlinear electronic elements such as transistors, FET’s, and vacuum tubes. Applications to amplifiers. Prereq: A grade of C or better in EE 221.
EE 462G ELECTRONIC CIRCUITS LABORATORY. (2) Experimental exercises in the design and analysis of useful electronic circuits incorporating semiconductor devices: transistors, tunnel and Zener diodes; also, vacuum tubes, integrated circuits and operational amplifiers. Lecture, one hour; laboratory, three hours. Prereq: EE 222; prereq or concur: EE 461G.

EE 468G FIELDS AND WAVES. (4) Applications of electromagnetic theory; electrostatic and magnetostatic fields; Maxwell’s field equations; plane waves; transmission lines and waveguides; antennas and radiation. Prereq: Engineering standing.

EE 481 LOGICAL DESIGN LABORATORY. (2) A laboratory involving the design and implementation of logic circuits. Combinational and sequential (both synchronous and asynchronous) design examples using small and medium scale integrated circuits. Lecture, one hour; laboratory, one-three-hour session. Prereq: EE 222, EE 280, and a C or better in EE 221.

EE 499 ELECTRICAL ENGINEERING DESIGN (Subtitle required). (3) A course for senior students in electrical engineering with an emphasis on the engineering design processes requiring the creative involvement of students in open-ended problems relating to actual designs that are appropriate to the profession of electrical engineering. Prereq: Engineering standing.

EE 511 INTRODUCTION TO COMMUNICATION SYSTEMS. (3) An introduction to the basic signal processing operations in communications systems. Topics include frequency and time domain signal and system representation, random signals, modulation, sampling, pulse modulation, information theory. Prereq: EE 421G and engineering standing.

EE 512 DIGITAL COMMUNICATION SYSTEMS. (3) A treatment of the basic signaling concepts involved in the communication of digital information. Topics include transmission requirements and distortion of digital signals; discrete amplitude, frequency, and phase modulation; error control coding. Prereq: EE 421G and engineering standing or consent of instructor.

EE 516 POWER SEMICONDUCTOR MODELS. (3) Analyze and develop circuit models for power semiconductor devices. Develop an understanding of their design and application. Develop the background to be an intelligent user of modern electronic circuit simulation programs and open a window to understanding the literature on semiconductor devices. Prereq: EE 461G, EE 468G and engineering standing.

EE 517 ADVANCED ELECTROMECHANICS. (3) Dynamics of electromechanical systems and rotating electrical machines. Applications of electromagnetic theory to electrical machines. Certain special topics of current interest. Prereq: EE 415G and engineering standing.

EE 518 ELECTRIC DRIVES. (3) Introduction to common power electronic converters used in electric motor drives. Steady-state analysis methods for electric machines fed by power conditioning converters. Performance prediction of electric machines by electromagnetic field theory and by coupled oil models. Prereq: EE 415G and engineering standing.

EE 522 ANTENNA DESIGN. (3) Principles of radiation, potential solution to Maxwell’s equations for current in empty space, electrically small antennas, antenna arrays, wire antenna principles, introduction to numerical methods, aperture antennas, frequency scaling antennas, receiving properties of antennas, antenna measurement techniques. Prereq: EE 468G and engineering standing.

EE 523 MICROWAVE CIRCUIT DESIGN. (3) Physical and mathematical descriptions of wave propagation in guided structures; microstrip lines; microwave integrated circuits; passive components; two-terminal devices; four-terminal devices; S-parameter concept; equivalent circuit concept; solid state microwave amplifiers and oscillators. Prereq: EE 468G and engineering standing.

EE 524 SOLID STATE PHYSICS. (3) Introductory solid state physics with emphasis on the properties of electrons in crystals; crystal structure, crystal diffraction, reciprocal lattice, lattice vibrations and phonons, free electron theory, energy bands in solids, semiconductors. Prereq: Engineering standing and PHY 520, or consent of instructor. (Same as PHY 524.)

EE 525 NUMERICAL METHODS AND ELECTROMAGNETICS. (3) This course covers the basics of numerical methods and programming with applications in electromagnetics. Examples range from statics to radiation/scattering problems involving numerical solutions to integro-differential and finite difference equations. Prereq: EE 468G and engineering standing, or consent of instructor.

EE 527 ELECTROMAGNETIC COMPATIBILITY. (3) Design of electronic systems to minimize 1) emission of electromagnetic signals that cause interference in other electronic systems, 2) the susceptibility of that system to electromagnetic signal from other electronic systems, and 3) the susceptibility of that system to its own, internally generated signals. A set of brief laboratory experiments demonstrate the design principles and provide familiarity with modern test equipment. Prereq: EE 468G and engineering standing.

EE 530 ROBOTICS. (3) Methods of analysis, design, and operation of industrial and mobile robots. Kinematic and dynamic models of mechanical manipulators. Electromechanical drive systems. Robotic vision and sensors. Control and optimization of motion trajectories. Control programming. Current topics of interest from the literature. Prereq: EE 415G or EE 306, EE 422 or ME 343, EM 313 or EM 230, and engineering standing.

EE 537 ELECTRIC POWER SYSTEMS I. (3) Application of symmetrical components to power system fault studies, calculation of transmission line parameters. Prereq: EE 468G.

EE 538 ELECTRIC POWER SYSTEMS II. (3) Introduction to modern power system practices, basic transient and steady-state stability analysis with emphasis on digital techniques. Prereq: Engineering standing and consent of instructor.

EE 550 SEMICONDUCTOR DEVICE DESIGN. (3) Theory, development and discussion of equivalent circuit models of transistor devices, negative resistance, semiconductor devices and photodetectors devices based on electronic processes in solid state elements. High and low frequency, as well as the Ebers-Moll and charge control switching models and their application in computerized electronic circuit analysis will be developed. Prereq: EE 461G or equivalent, and engineering standing.

EE 551 ELECTRIC AND MAGNETIC PROPERTIES OF MATERIALS. (3) Study of dielectric and magnetic materials. Topics include dielectric relaxation, conduction and breakdown mechanisms, liquid crystals, ferroelectrics, magnetic resonance and relaxation, measurement techniques. Prereq: MSE 212 and PHY 361 or EE 461G or consent of instructor. (Same as MSE 561.)

EE 562 ANALOG ELECTRONIC CIRCUITS. (3) Feedback amplifiers, tuned and untuned amplifiers, oscillators, AM and FM transmitters. Prereq: EE 461G and engineering standing.

EE 564 DIGITAL ELECTRONIC CIRCUITS. (3) Timing, scanning, trigger/logic and pulse circuits; video and broadband R-F amplifiers. Prereq: EE 461G and engineering standing.

EE 566 HYBRID MICROELECTRONICS. (3) The purpose of this course is to study design, material selection, and fabrication of hybrid microelectronic circuits. Students will learn the general features of thick film, thin film, ceramic, multilayer, and hybrid module technologies. Both fabrication and electrical properties of circuit elements will be emphasized. Prereq: Engineering standing or consent of instructor. (Same as MSE 566.)

EE 567 INTRODUCTION TO LASERS AND MASERS. (3) Basic principles of laser action; atomic transitions; population inversion; two and three level systems; optical resonators; pumping methods; applications. Prereq: Engineering standing or consent of instructor. (Same as PHY 567.)

EE 568 FIBER OPTICS. (3) The course presents theory and practice related to: (a) fiber optic cable and their fabrication, (b) fiber optic transmitters and detectors, (c) fiber optic communication systems and (d) fiber optic remote sensors. Prereq: EE 468G. (Same as MSE 568.)

EE 569 ELECTRONIC PACKAGING SYSTEMS AND MANUFACTURING PROCESSES. (3) Study of packaging systems which interconnect, support, power, cool, protect, and maintain electronic components. The course will address systems at the chip, board, and product levels. Topics include design, properties, materials, manufacture, and performance of various packaging systems. Laboratory will provide familiarity with design software and production equipment and processes. Prereq: EE 211 or EE 305 or EE 307. (Same as MSE 569.)

EE 571 FEEDBACK CONTROL DESIGN. (3) System representation via transfer function and state variables, root locus analysis, Bode plots, compensation by root-locus and frequency response methods; state variable feedback; sensitivity analysis; tracking via output feedback; digital control systems. Prereq: EE 421G and engineering standing.
EE 572 DIGITAL CONTROL OF DYNAMIC SYSTEMS. (3)
Zero and first order hold, theory of analog to digital and digital to analog conversion. 
Z-transform analysis, discrete state variable analysis, discrete estimation techniques, 
error analysis of discrete systems. Prereq: EE 422G, engineering standing.

EE 581 ADVANCED LOGICAL DESIGN. (3)
Medium-scale and large-scale digital components; register-transfer; bus-structures; 
controller/process organizations. Design of arithmetic processors and stored-program 
computers. Microprogramming. Prereq: EE 280 and EE/CS 380; engineering standing 
or upper division computer science standing.

#EE 582 HARDWARE DESCRIPTION LANGUAGES 
AND PROGRAMMABLE LOGIC. (3)
A study of hardware description languages including netlists, VHDL and Verilog; their 
use in digital design methodologies including modeling techniques, design verification, 
simulation, synthesis, and implementation in programmable and fabricated logic media. 
Programmable logic topics include CPLD and FPGA architectures, programming 
technologies and techniques. Prereq: Engineering standing and EE 380 and EE 461G.

EE 583 MICROPROCESSORS. (3)
A course in the hardware and software of microprocessors. Assembly language 
programming, address decoding, hardware interrupts, parallel and serial interfacing with 
various special purpose integrated circuits. Each student is expected to do homework 
assignments using microprocessor hardware. This will be arranged by special 
appointment through the instructor. Prereq: EE 280 and EE/CS 380; engineering standing 
or upper division computer science standing.

EE 584 INTRODUCTION OF VLSI DESIGN AND TESTING. (3)
Introduction to the design and layout of Very Large Scale Integrated (VLSI) Circuits 
for complex digital systems; fundamentals of the VLSI fabrication process; and 
introduction to VLSI testing and structured design for testability techniques. Prereq: 
Engineering standing and EE 461 or consent of instructor.

EE 585 FAULT TOLERANT COMPUTING. (3)
Fault models in logic networks will be developed and then various testing techniques 
for detection of faults in logic networks will be discussed. Systematic approach for 
designing logic networks for testability will be introduced. Self-testing and fault tolerant 
design of logic systems using coding theory will be covered. Prereq: EE 581 or consent 
of the instructor, engineering standing or upper division computer science standing.

#EE 586 COMMUNICATION AND SWITCHING NETWORKS. (3)
Fundamentals of modern communication networking and telecommunications, data 
transmission, multiplexing, circuit switching networks, network topology routing and 
control, computer communication, packet switching networks, congestion control, 
frame relay, ATM switching networks, traffic and congestion control. Prereq: EE 280.

EE 587 MICROCOMPUTER SYSTEMS DESIGN. (3)
A course in the design of microcomputer systems for hardware engineers which includes 
the following topics: use of uncommitted logic arrays in instruction set design; hardware 
support for operating systems and programming languages; customizing microcomputers 
for specific execution environments, and control of concurrency. Prereq: EE 581 and 
EE 583, or consent of instructor, engineering standing or upper division computer science standing. 
(Same as CS 587.)

EE 595 INDEPENDENT PROBLEMS. (1-3)
For electrical engineers. A problem, approved by the chairperson of the department, 
provides an objective for study and research. May be repeated to a maximum of six credits. 
Prereq: 2.5 standing and engineering standing.

EE 599 TOPICS IN ELECTRICAL 
ENGINEERING (Subtitle required). (2-3)
A detailed investigation of a topic of current significance in electrical engineering such 
as biomedical instrumentation, digital filter design, active networks, advanced electrical 
deVICES, digital communications, display of electronics. May be repeated to a maximum 
of six credits, but only three credits can be earned under the same title. A particular topic 
may be offered at most twice under the EE 599 number. Prereq: Equivalent of two 400- 
level courses in electrical engineering, consent of instructor and engineering standing.

PREREQUISITE FOR GRADUATE WORK: Students desiring to take any of 
the following courses should have a thorough working knowledge of chemistry, physics 
and mathematics. For major work, a candidate must hold a bachelor’s degree in electrical 
engineering or its equivalent.

EE 601 ELECTROMAGNETIC ENERGY CONVERSION I. (3)
Generalized electric machine theory; parameter determination. Energy conversion in 
continuous media including magnetohydrodynamics. Prereq: Consent of instructor.

EE 603 POWER ELECTRONICS. (3)
Study of solid-state power electronic devices and their applications in power conditioned 
electric motor drive systems. Examination of control philosophies, steady-state models, 
and numerical simulation of characterizing differential equations. Current topics of 
interest from the literature. Prereq: EE 517 and EE 571 or consent of instructor.

EE 605 SYSTEMS FOR FACTORY 
INFORMATION AND CONTROL. (3)
Systems approach to manufacturing. Hardware and software for real time control and 
reporting. Sensor and actuators, controllers, networks, databases, hierarchical and 
distributed control, CAD/CAM systems, flexible manufacturing systems, group 
technology, modeling and simulation of factory operations. Lecture, two hours; 
laboratory, two hours. Prereq: MFS 505. (Same as MFS 605.)

EE 606 SEMINAR AND PROJECT IN 
MANUFACTURING SYSTEMS ENGINEERING. (3)
A project course for manufacturing systems. Course consists of seminar presentations 
by outside professionals and faculty and a course project on a realistic manufacturing 
systems assignment. Lecture, two hours; laboratory, two hours. (Same as ME/MFS 606.)

EE 608 ADVANCED TOPICS IN POWER 
eLECTRONICS (Subtitle required). (3)
Study of emerging research and design practices in power electronic circuits and power 
conditioned electric motor drives. A review and extension of selected topics in the current 
literature. May be repeated to a maximum of six credits under different subtitles. Prereq: 
Consent of instructor.

EE 611 DETERMINISTIC SYSTEMS. (3)
Concepts of linear systems, singularity functions, convolution and superposition 
integrals, state-variable method for linear systems, relation between transfer function and 
state-variable equations, fundamental matrix, state-transition matrix, unit-impulse 
response matrix, and transmission matrix. Prereq: EE 421G.

EE 613 OPTIMAL CONTROL THEORY. (3)
State-space modeling of control systems; variational techniques; system optimization 
by maximum principle, dynamic programming. Hamilton-Jacobi equations design of 
linear optimal systems; computational methods for solving boundary value problems. 
Prereq: EE 611.

EE 619 PROBLEMS SEMINAR IN 
OPERATIONS RESEARCH. (3)
In this course the student is exposed to the art of applying the tools of operations research 
to real world problems. The seminar is generally conducted by a group of faculty members 
from the various disciplines to which operations research is applicable. Prereq: MA 617 
and STA 525 or consent of instructor. (Same as STA 619 and MA 613.)

EE 621 ELECTROMAGNETIC FIELDS. (3)
Development of electromagnetic field theory from the basic postulates of Maxwell’s 
equations in differential and integral forms, solution to static, quasistatic, and wave-
propagation problems. Radiation from dipole antenna elements. Prereq: EE 460G.

EE 622 ADVANCED ELECTRODYNAMICS. (3)
Solution methods for applied electromagnetics problems; uniqueness, equivalence, 
duality, reciprocity; linear space methods; wave solutions in separable coordinate 
systems; classical problems in cartesian, cylindrical, and spherical coordinates. Prereq: 
EE 468G.

EE 625 COMPUTATIONAL ELECTROMAGNETICS. (3)
This advanced course in computational electromagnetics primarily covers moment 
method and finite element method solutions to scattering problems. Representative 
topics of the course include surface and volume equivalence principles, scattering by 
material cylinders, scattering by periodic structures and absorbing boundary condition 
models. Prereq: EE 525, EE 621, or consent of instructor.

EE 627 MULTICONDUCTOR TRANSMISSION LINES. (3)
Analysis of electromagnetic coupling in multiconductor transmission lines. Emphasis 
on modeling the line for the purposes of predicting crosstalk and incident field effects. 
Applications to interference prediction, power transmission line transients, and 
synthesis of microwave filters and circuits. Prereq: EE 460G or consent of instructor.

EE 630 DIGITAL SIGNAL PROCESSING. (3)
An introductory treatment of the basic concepts of signal processing via time and 
frequency domain (Z-transform) methods and a survey of procedures for designing, 
implementing and using digital signal processors. Prereq: EE 512 or consent of instructor.
EE 635 IMAGE PROCESSING. (3)
The course outlines applications of image processing and addresses basic operations involved. Topics covered include image perception, transforms, compression, enhancement, restoration, segmentation, and matching. Prereq: Graduate standing and consent of instructor. (Same as CS 635.)

EE 639 ADVANCED TOPICS IN SIGNAL PROCESSING AND COMMUNICATIONS. (3)
Advanced topics in signal processing and communications research and design topics of current interests, such as optical processing, pattern recognition, satellite systems, and digital communication networks. A review and extension of current literature and selected papers and reports. May be repeated to a maximum of nine credits. Prereq: Advanced graduate standing.

EE 640 STOCHASTIC SYSTEMS. (3)
Random variables, stochastic processes, stationary processes, correlation and power spectrum, mean-square estimation, filter design, decision theory, Markoff processes, simulation. Prereq: EE 421G.

EE 642 DISCRETE EVENT SYSTEMS. (3)
The objective of the course is to prepare students for research in the field of supervisory control of discrete event systems (DES’s). Logical models, supervising control. Stability and optimal control of DES, complexity analysis and other related research areas will be covered. Prereq: Graduate standing or consent of instructor. (Same as CS 642.)

EE 661 SOLID-STATE ELECTRONICS. (3)
Bose and Fermi statistics; semiconductor theory; solid-state devices; electrical properties of insulators; theory and applications of magnetic materials, including ferrites. Prereq: EE 461G.

EE 672 MOLECULAR PROPERTIES IN ELECTRONIC DEVICES. (3)
The study of molecular properties and the application of these properties in electronic devices. Correlation of molecular energy states with infrared and Raman spectra; selection rules and intensities of transitions; instrumentation for molecular investigation; applications. Prereq: Consent of instructor.

EE 684 INTRODUCTION TO COMPUTER AIDED DESIGN OF VLSI CIRCUITS. (3)
Computer aided design of Very Large Scale Integration (VLSI) circuits. Topics include: VLSI technologies, CMOS circuit characteristics, computer aids in the design of VLSI circuits, use of various CAD tools for layout, circuit design, logic design, and functional design, and the use of VLSI circuits in the system design. A design project is required. Prereq: EE 581 and EE 461G or consent of instructor.

EE 685 DIGITAL COMPUTER STRUCTURE. (3)
Study of fundamental concepts in digital computer system structure and design. Topics include: computer system modeling based on instruction set processor (ISP) and processor-memory-switch (PMS) models, design and algorithms for ALU, processor, control unit and memory system. Special topics include floating-point arithmetic, cache design, pipeline design technologies, and parallel computer architectures. Prereq: EE 380 and EE 581 or consent of instructor.

EE 686 ADVANCED COMPUTER ARCHITECTURE DESIGN. (3)
A study of current diverse advanced architectures such as microprogrammed, parallel, array and vector, networked, and distributed architectures; applications and example systems exploiting these architectures; matching applications to architectures; consideration of architectures of the future. Prereq: EE 685.

EE 688 NEURAL NETWORKS. (3)
The purpose of this course is to introduce various aspects of the neural networks and neurocomputing. The course starts with an introduction to Learning Machines and analyzes various learning algorithms such as Hebbian, Grossberg’s and Kohonen’s learning algorithms. Some of the neural networks that will be studied in detail are: Backpropagation nets, Hopfield nets, Adaptive Resonance Theory, Adaline and Madalines, Kohonen’s Self learning nets, BAMS, Neocognition, etc. Students will implement a minimum of three learning algorithms. Prereq: Graduate standing. (Same as CS 688.)

EE 699 TOPICS IN ELECTRICAL ENGINEERING (Subtitle required). (3)
A detailed study of a topic of current interest in electrical engineering. May be repeated to a maximum of six credits, but only three credits may be earned under the same subtitle. A particular topic may be offered at most twice under the EE 699 number. Prereq: Consent of instructor.

EE 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

EE 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

EE 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

EE 769 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE. (0-12)
May be repeated indefinitely.

EE 783 SPECIAL PROBLEMS IN ELECTRICAL ENGINEERING. (3)
Open to graduate students only. Individual work on an assignment approved by the chairperson of the department. May be repeated to a maximum of nine credits.

EE 784 RESEARCH PROJECT IN ELECTRICAL ENGINEERING. (3)
Individual study related to a special research project supervised by the student’s advisor. A final written report on the project is required. This course is open only to and required by students pursuing the MSEE degree with a non-thesis option (Plan B). The course cannot satisfy part of the required 30 hours of course work for Plan B. Prereq: Approval of student’s MSEE advisor.

EGR Engineering

EGR 199 TOPICS IN ENGINEERING: TITLE TO ASSIGNED. (1-6)
An experimental, topical or interdisciplinary course devoted to special topics of interest in engineering. Course offerings must be approved by the Deans and Chairpersons of all cosponsoring academic units. A particular title may only be offered twice under the EGR 199 number. Students may not repeat this course under the same title. May be repeated to a maximum of twelve hours. Prereq: Enrollment in the College of Engineering, or permission of the instructor.

EGR 399 COOPERATIVE ENGINEERING EDUCATION. (1)
A course designed for undergraduate students who, through the engineering cooperative education office, secure full-time, salaried, career-related positions under the supervision of a sponsoring employer. Enrollment in the course constitutes full-time status. Course may be taken on a pass-fail basis only and may be repeated on a rotational basis to a maximum of six credit hours. Prereq: Approval of Coordinator of Cooperative Engineering Education.

EGR 401 CAREER PLANNING/EMPLOYMENT SEMINAR. (1)
This course will introduce students to the various elements involved in obtaining a position in their chosen field of engineering. Prereq: Engineering standing.

EGR 537 NUMERICAL ANALYSIS. (3)
Floating point arithmetic. Direct methods for the solution of systems of linear algebraic equations. Polynomial and piecewise polynomial approximation, orthogonal polynomials. Numerical integration: Newton-Cotes formulas and Gaussian quadrature. Basic methods for initial value problems for ordinary differential equations. The emphasis throughout is on the understanding and use of software packages for the solution of commonly occurring problems in science and engineering. Prereq. CS/MA 321 or equivalent, or graduate standing or consent of instructor. Knowledge of a procedural computer language is required. (Same as CS/MA 537.)

EGR 599 TOPICS IN ENGINEERING (Subtitle required). (1-3)
An experimental, interdisciplinary course devoted to a topic of interest to students in several departments of the college. May be repeated to a maximum of six credits, but only three credits may be earned under the same title. A particular topic may be offered at most twice under the EGR 599 number. Prereq: Variable, given when topic is identified.

EGR 611 BOUNDARY ELEMENT METHODS IN ENGINEERING. (3)
Introduction of boundary element methods for use in solving common engineering equations, such as the Laplace equation, the Poisson equation, the wave equation, and the diffusion equation. Both the theoretical and numerical aspects of the boundary element technique are presented. Application areas include heat conduction, potential flow problems, acoustic wave propagation, general diffusion, and stress analysis. Prereq: EGR 537 or consent of instructor. (Same as ME 611.)
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<tr>
<th>Course Code</th>
<th>Course Title and Description</th>
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<tbody>
<tr>
<td><strong>EM 221 STATICS.</strong></td>
<td>Study of forces on bodies at rest. Vector algebra; study of force systems; equivalent force systems; distributed forces; internal forces; principles of equilibrium; application to trusses, frames and beams; friction. Prereq or concur: MA 213.</td>
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<tr>
<td><strong>EM 302 MECHANICS OF DEFORMABLE SOLIDS.</strong></td>
<td>A study of stress and strain in deformable solids with application primarily to linear elastic materials: stress and strain transformations; simple tension and compression of axial members; torsion of shafts; bending of beams; combined loading of members; buckling of columns. Prereq: Registration in the College of Engineering or consent of chairperson, and EM 221; prereq or concur: MA 214.</td>
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<tr>
<td><strong>EM 313 DYNAMICS.</strong></td>
<td>Study of the motion of bodies. Kinematics: cartesian and polar coordinate systems; normal and tangential components; translating and rotating reference frames. Kinetics of particles and rigid bodies: laws of motion; work and energy; impulse and momentum. Prereq: Registration in College of Engineering or consent of chairperson and EM 221, MA 214, and CS 221 or CS 222 or CS 223.</td>
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<tr>
<td><strong>EM 506 MECHANICS OF COMPOSITE MATERIALS.</strong></td>
<td>A study of the structural advantages of composite materials over conventional materials, considering high strength-to-weight and stiffness-to-weight ratios. Fiber reinforced, laminated and particulate materials are analyzed. Response of composite structures to static and dynamic loads, thermal and environmental effects, and failure criteria are studied. Prereq: EM 302, engineering standing or consent of instructor. (Same as ME/ MSE 506.)</td>
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<tr>
<td><strong>EM 513 MECHANICAL VIBRATIONS.</strong></td>
<td>The analysis of vibrational motion of structural and mechanical systems. Single-degree-of-freedom systems; free vibrations; nonperiodic excitation; harmonic excitation. Modal analysis of multiple-degree-of-freedom systems. Vibration of continuous bodies, including strings and bars (axial, torsional and flexural modes). Energy methods. Prereq: EM 313 and EM 302, engineering standing or consent of instructor. (Same as ME 513.)</td>
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<tr>
<td><strong>EM 527 APPLIED MATHEMATICS IN THE NATURAL SCIENCES I.</strong></td>
<td>Construction, analysis and interpretation of mathematical models applied to problems in the natural sciences. Physical problems whose solutions involve special topics in applied mathematics are formulated, various solution techniques are introduced, and the mathematical results are interpreted. Fourier analysis, dimensional analysis and scaling rules, regular and singular perturbation theory, random processes and diffusion are samples of selected topics studied in the applications. Intended for students in applied mathematics, science and engineering. Prereq: MA 432G or three hours in an equivalent junior/senior level mathematics course or consent of the instructor. (Same as MA/ME 527.)</td>
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<tr>
<td><strong>EM 531 ADVANCED STRENGTH OF MATERIALS.</strong></td>
<td>Unsymmetrical bending of beams, thin plates, stress analysis of thick-walled cylinders, and rotating discs. Theory of elastic energy, curved beams, stress concentration, and fatigue. Prereq: EM 302 and engineering standing. (Same as ME 532.)</td>
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<tr>
<td><strong>EM 532 AIRCRAFT AND MISSILE STRUCTURAL ANALYSIS.</strong></td>
<td>Thin-walled structures used in aircraft, missile, and pressure vessel applications are studied. The response of thin-walled structures to flexure, torsion, pressure loads and temperature variations is analyzed by energy and approximate methods. Study of conventional and advanced composite materials, and the effects of creep and plasticity. Prereq: EM 302 or equivalent and engineering standing.</td>
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<tr>
<td><strong>EM 556 INTRODUCTION TO COMPOSITE MATERIALS.</strong></td>
<td>Applications, materials selection and design of composite materials. Relation between properties of constituent materials and those of composite. Processing methods for materials and for some structures. Lab focuses on preparation and testing of composite materials and their constituents. Lecture, three hours; laboratory, three hours per week. Prereq: MA 214, CHE 236, PHY 232, MSE 201, or consent of instructor. (Same as ME/MSE 556.)</td>
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<tr>
<td><strong>EM 585 FOURIER SERIES AND BOUNDARY VALUE PROBLEMS.</strong></td>
<td>An introductory treatment of Fourier series and its application to the solution of boundary value problems in the partial differential equations of physics and engineering. Orthogonal sets of functions, Fourier series and integrals, solution of boundary value problems, theory and application of Bessel functions and Legendre polynomials. Prereq: MA 432G or equivalent. (Same as MA 485G/ME 585.)</td>
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<tr>
<td><strong>EM 601 FOUNDATIONS OF SOLID MECHANICS.</strong></td>
<td>A brief review of vectors and an in-depth discussion of tensors and tensor calculus. Stress, deformation and strain. Continuum balance principles of mass, momentum and energy, the equations of motion and the energy equation. Entropy, the principles of material frame indifference and material symmetry. Various constitutive models, including elasticity (linear and/or non-linear), plasticity and viscoelasticity. Thermoelectricity, hyperelasticity, hypoelasticity, and electroelasticity may also be addressed. Prereq: EM 531 or ME 532 or consent of instructor. (Same as ME 641.)</td>
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<tr>
<td><strong>EM 603 MECHANICS OF PLASTIC SOLIDS I.</strong></td>
<td>Permanent changes in shape of solid materials occur as plastic deformations in many engineering applications, such as extrusion, forging and rolling. This course examines the experimental basis and fundamental theoretical framework for plastic materials. The analysis of plastic deformations in simple bending, torsion, tension and compression, and some two dimensional problems are presented. Connection between mechanics parameters, design variables and metallurgical phenomena are discussed. Limit analysis is studied. Prereq: EM 601/ ME 641, or EM/ME 651 or consent of instructor. (Same as ME 603.)</td>
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<tr>
<td><strong>EM 613 NONLINEAR OSCILLATIONS.</strong></td>
<td>Many physical systems exhibit some nonlinear behavior. This course presents some methods of analyzing discrete, nonlinear, dynamical systems and applies the methods to typical mechanical systems. Various kinds of nonlinear behavior, including resonance phenomena such as harmonics, parametric excitation, and discontinuous jumps in amplitude, are considered. Lyapunov stability criteria and Floquet and Routhian procedures for performing stability analyses of systems are introduced, and their physical interpretations for various systems are studied. Prereq: EM/ME 513. (Same as ME 613.)</td>
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<tr>
<td><strong>EM 628 APPLIED MATHEMATICS IN THE NATURAL SCIENCES II.</strong></td>
<td>Continuation of EM/MA 527 with emphasis on special topics and techniques applied to partial differential equations that occur in various physical field theories. Field equations of continuum mechanics of solids and fluids are reviewed. The method of characteristics, elliptic functions and integrals, Legendre polynomials, Mathieu functions, integral equations and transforms, and the methods of potential theory are examples of selected topics studied in introductory applications. Intended for students in applied mathematics, science and engineering. Prereq: EM/MA 527. (Same as MA 628.)</td>
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<tr>
<td><strong>EM 645 ADVANCED DYNAMICS I.</strong></td>
<td>Many physical systems in engineering involve rigid bodies in translation and rotation. Such motions are studied in this course by the use of Euler’s Laws. The kinematical description of the motions utilize the concept of reference frames. The inertia properties of rigid bodies, and the energy functions for rigid bodies are covered. Analytical and numerical solutions of dynamical systems of engineering interest are considered. Prereq: EM 313; prereq, or concur: MA 432G. (Same as ME 645.)</td>
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<tr>
<td><strong>EM 651 MECHANICS OF ELASTIC SOLIDS I.</strong></td>
<td>Many engineering applications involve the use of materials that behave elastically when performing their desired function. This course concerns the general analysis of small deformations, stress, and stress-deformation relations for elastic bodies. The solution of typical problems frequently encountered in engineering applications, e.g., extension, bending, and torsion of elastic bars, stress concentrations and thermoelastic behavior, are studied. Some modern computational methods currently used in engineering practice are introduced. Prereq: MA 432G or consent of instructor. (Same as ME 651.)</td>
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**Endodontics**

**EM 652 MECHANICS OF ELASTIC SOLIDS II.** (3) Continuation of EM 651 with more attention to the fundamental structure of and important historical and contemporary contributions to elastic theory. Extensive use of modern computational methods that were introduced in the first course will provide familiarity with the solution of larger scale, industrially important elasticity problems. Application of the boundary integral equation method (BIE) will be emphasized. Some use also will be made of the finite element method, primarily for comparison with BIE. Prereq: EM 651 or consent of instructor.

**EM 653 METHODS OF APPLIED DIFFERENTIAL EQUATIONS.** (3) Integrals of nonlinear partial differential equations; similarity variables and other transformations; perturbation methods; weighted residual methods; numerical methods; selected topics. Prereq: MA 432G or consent of instructor. (Same as ME 653.)

**EM 748 MASTER’S THESIS RESEARCH.** (0) Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

**EM 749 DISSERTATION RESEARCH.** (0) Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

**EM 760 RESEARCH PROJECT IN ENGINEERING MECHANICS.** (0) Individual study related to a special research project supervised by the student’s advisor. A final written report on the project is required. Prereq: Approval of director of graduate studies.

**EM 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE.** (1-6) May be repeated to a maximum of 12 hours.

**EM 769 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE.** (0-12) May be repeated indefinitely.

**EM 780 SPECIAL PROBLEMS IN ENGINEERING MECHANICS.** (3) A mechanism for special and individualized study of a wide range of topics of interest to the advanced student of engineering mechanics. May be repeated to a maximum of nine credits. Prereq: Approval of director of graduate studies.

**END 800 CLINICAL ENDODONTICS SEMINAR.** (1) This course is designed to give a more in-depth hands-on view of some of the newest concepts in endodontics. Seminars will be presented including new concepts of instrumentation and root canal obturation. Demonstrations and hands on class participation will supplement the seminars. Note: scheduling for this course will take place outside of regularly scheduled class/clinic time. Prereq: END 830, END 831, ranked in the upper half of the class, and consent of instructor.

**END 880 CLINICAL ENDODONTICS SEMINAR.** (1) This course is designed to provide more in-depth hands-on view of some of the newest concepts in endodontics. Seminars will be presented including new concepts of instrumentation and root canal obturation. Demonstrations and hands on class participation will supplement the seminars. Note: scheduling for this course will take place outside of regularly scheduled class/clinic time. Prereq: END 830, END 831, ranked in the upper half of the class, and consent of instructor.

**ENG English**

**ENG 098 ENGLISH FOR SPEAKERS OF OTHER LANGUAGES.** (3) This course is a writing course designed to provide international undergraduate students with a firm basis in the rhetorical patterns of written English and in the grammatical structures and expressions associated with those patterns. It also serves as an introduction to the analysis and organization of information as found in English paragraphs and essays. Emphasis is placed upon writing beyond the sentence level. Students must attain at least a C in order to enter ENG 099. The course may be repeated up to six credits. Students cannot count this credit toward the Freshman Composition requirement or toward the graduation requirement. Lecture, five hours per week.

**ENG 101 WRITING I.** (3) A course in writing emphasizing argument. Instruction and practice in reading critically, thinking logically, responding to texts, developing research skills, writing substantial essays through systematic revision, addressing specific audiences, expressing ideas in standard and correct English. Includes grammar and mechanics review. Notes: (a) Credit not available by special examination; (b) ENG 101 and ENG 102 may not be taken concurrently.

**ENG 102 WRITING II.** (3) Argumentative writing. Emphasis on development of a fluent, precise, and versatile prose style. Continued instruction and practice in reading critically, thinking logically, responding to texts, developing research skills, writing substantial essays through systematic revision, addressing specific audiences, expressing ideas in standard and correct English. Prereq: ENG 101 or equivalent. Notes: (a) Credit not available by special examination; (b) ENG 101 and ENG 102 may not be taken concurrently.

**ENG 105 WRITING: AN ACCELERATED COURSE.** (3) An intensive course in writing that combines the content of ENG 101 and ENG 102, emphasizing argumentation and library research. ENG 105 satisfies the University Writing Requirement for students who qualify for admission by ACT score and special examination. Note: Credit for this course and for fulfillment of the University Writing Requirement possible by CLEP examination.

**ENG 161 INTRODUCTION TO LITERATURE.** (3) An analytical rather than historical approach to literature, intended to deepen the student’s insight into the nature and purpose of literature and to develop literary taste and judgment. Designed especially for nonmajors, this course satisfies no requirements of the English major. (Offered in Community College System only.)

**ENG 201 ETYMOLOGY.** (3) A study of words and their fundamental values with reference to development of a writing vocabulary. (Same as JOU 250.)

**ENG 203 BUSINESS WRITING.** (3) Instruction and experience in writing for business, industry, and government. Emphasis on clarity, conciseness, and effectiveness in preparing letters, memos, and reports for specific audiences. Prereq: Completion of University Writing requirement.

**ENG 204 TECHNICAL WRITING.** (3) Instruction and experience in writing for science and technology. Emphasis on clarity, conciseness, and effectiveness in preparing letters, memos, and reports for specific audiences. Prereq: Completion of University Writing requirement.
ENG 205 INTERMEDIATE WRITING. (3)
Instruction and experience in nonfictional writing. The emphasis is on clarity, conciseness, and effective form in abstracts, in case studies, and in literature reviews for special audiences. Assignments include research and oral presentations. Note: ENG 205 fulfills no requirements of the English major. Prereq: Completion of the University Writing requirement.

ENG 207 BEGINNING WORKSHOP IN IMAGINATIVE WRITING (Subtitle required). (3)
A beginning course in the craft of writing, teaching students how to read critically and how to revise work in progress. The students provide an audience for each other’s work. Exercises involve practice in aspects of craft and promote experimentation with different forms, subjects, and approaches; outside reading provides models and inspiration. May be repeated under different subtitle to a maximum of six credits. Prereq: Consent of instructor.

ENG 211 INTRODUCTION TO LINGUISTICS. (3)
Introduction to the scientific study of human language. Emphasis on the fundamental principles of linguistic theory; applications of these principles in the investigation of grammatical structure, language change, regional and social dialect variation, and the acquisition of language by children. Credit will not be given to students who already have credit for either ANT 215 or ENG 414G. Prereq: Two college semesters or two high school years of a foreign language. (Same as LIN 211.)

ENG 221 SURVEY OF ENGLISH LITERATURE I. (3)
A survey of English literature from Beowulf through Milton. The emphasis is upon the more important writers, with attention to their cultural backgrounds.

ENG 222 SURVEY OF ENGLISH LITERATURE II. (3)
A survey of English literature from Dryden to the present. The emphasis is upon the more important writers, with attention to their cultural backgrounds.

ENG 251 SURVEY OF AMERICAN LITERATURE I. (3)
A survey of American literature from the Colonial Era to the Civil War. Emphasis upon the more important writers, with attention to their cultural backgrounds.

ENG 252 SURVEY OF AMERICAN LITERATURE II. (3)
A survey of American literature from the Civil War to the present. Emphasis upon the more important writers with attention to their cultural backgrounds.

ENG 261 SURVEY OF WESTERN LITERATURE FROM THE GREEKS THROUGH THE RENAISSANCE. (3)
A study of works by major Western authors from the Bible and ancient Greek literature through the Renaissance. Note: ENG 261 fulfills no requirement of the English major.

ENG 262 SURVEY OF WESTERN LITERATURE FROM 1660 TO THE PRESENT. (3)
A study of works by major Western authors from mid-17th century to the present. Note: ENG 262 fulfills no requirements of the English major.

ENG 264 MAJOR BLACK WRITERS. (3)
A cross-cultural and historical approach to written and oral works by major Black authors of Africa, the Caribbean and the United States. The course includes writers such as Chinua Achebe (Africa), Wilson Harris (Caribbean), and Toni Morrison (USA). (Same as AAS 264.)

ENG 270 THE OLD TESTAMENT AS LITERATURE. (3)
A survey of the major types of Old Testament literature in English translation. While attention will be paid to historical backgrounds, the emphasis is on careful analysis of literary forms and techniques.

ENG 271 THE NEW TESTAMENT AS LITERATURE. (3)
A survey of the major types of New Testament literature in English translation. While attention will be paid to historical backgrounds, the emphasis is on careful analysis of literary forms and techniques.

ENG 281 INTRODUCTION TO FILM. (3)
An introduction to the study of the movies as a narrative art and a cultural document. Viewing of films outside of class is required. May not be taken concurrently with ENG 380.

ENG 305 ADVANCED WRITING. (3)
An intermediate-level course in the forms of nonfictional writing. Emphasis on the growth of a graceful, professional writing style. To enter course, students must demonstrate basic writing proficiency, an absence of problems requiring remedial instruction in writing. Prereq: Completion of freshman English requirement and consent of instructor. Final enrollment contingent on writing portfolio review (details available in OT 1227).

ENG 320 INTRODUCTION TO LITERARY STUDY. (3)

ENG 356 STUDIES IN BLACK AMERICAN LITERATURE. (3)
An analytical-historical approach to the development of black American literature from Douglass and DuBois to Ellison, Baldwin, and Cleaver. (Same as AAS 356.)

ENG 360 THE SHORT STORY. (3)
Intensive study of the short story as a literary form. Readings will be drawn from a wide variety of stories and may include works by American, British, and, in translation, continental authors.

ENG 361 LITERARY TYPES (Subtitle required). (3)
Studies one or more of the following literary types: comedy, tragedy, satire, romance. Specific topics announced the preceding semester. May be repeated to a maximum of six credits with consent of English Department Director of Advising. May not be repeated under the same subtitle.

ENG 363 SPECIAL TOPICS IN LITERATURE (Subtitle required). (3)
Study of special topics in literature, in areas such as fiction, poetry, drama, and the relation of literature and intellectual movements. Topics announced the preceding semester. May be repeated under different subtitles to a maximum of nine credits.

ENG 364 STUDIES IN CONTEMPORARY LITERATURE (Subtitle required). (3)
Selected topics in the fiction and poetry of the English-speaking world since World War II. Topics announced the preceding semester. May be repeated under different subtitles for a maximum of six credits.

ENG 369 STUDIES IN SOUTHERN AMERICAN LITERATURE. (3)
Studies in Southern American literature with special attention to such major figures as the Southern Regionalists: Faulkner, Wolfe, Warren, O’Connor, Welty, and Dickey.

ENG 374 AMERICAN FOLKLORE. (3)
An introductory survey of folklore using American materials. The use of this material in other forms. Experience in actual collecting and in the cataloging of materials.

ENG 375 THE WOMAN WRITER. (3)
Survey of the themes and forms of female literary expression. Includes works by writers from a range of ethnic backgrounds and supplements the literature with biographical and social context.

ENG 378 TOPICS IN POPULAR CULTURE (Subtitle required). (3)
Variable in content and context, this course may focus on any of several aspects of popular culture—genre, theory, history, contemporary and past expressions in popular narrative forms. Specific content announced the preceding semester. May be repeated up to six hours with permission of English Department Director of Advising. May not be repeated under the same subtitle.

ENG 380 FILM CRITICISM. (3)
A course in film criticism as the art of seeing movies; attention is given to the process of descriptive analysis and evaluation. Viewing of the films outside of class is required. May not be taken concurrently with ENG 281.

ENG 381 HISTORY OF FILM I. (3)
The history of film as art and industry from the invention of the moving picture to World War II. Emphasis on the artistic development of the silent film in America and Europe, the rise of the American studio system, and the emergence of the sound film in the 1930’s. Viewing of films outside of class is required.

ENG 382 HISTORY OF FILM II. (3)
A history of film from World War II to the present. Emphasis on the artistic development of both the American film and various national cinemas (e.g., Italy, Sweden, France, Germany, Japan) during this period, with special consideration of the emergence of color and widescreen processes. Viewing of films outside of class is required.

ENG 383 JAPANESE FILM. (3)
Study of Japanese films as an expression of Japanese culture. Viewing of films outside of class is required.

ENG 390 UNDERGRADUATE SEMINAR (Subtitle required). (3)
Detailed investigation of a given topic, author, or theme with emphasis on both content and methods of research. Topics vary from section to section and are announced the preceding semester. Enrollment limited to 15 students. May be repeated to a maximum of six credits. Prereq: Consent of instructor.
ENG 395 INDEPENDENT WORK. (1-3)
For undergraduate majors in English with a high standing. Each pursues a course independently under the guidance of a staff member, writes a paper embodying the results of his study, and takes an examination. May be repeated to a maximum of six credits. Prereq: Major, standing of 3.0 in the department, and permission of the chairperson.

ENG 401 SPECIAL TOPICS IN WRITING (Subtitle required). (3)
Studies of special topics in writing, in areas such as technical writing, legal writing, cultural critique, and formal argument. Topics announced the preceding semester. May be repeated under different subtitles to a maximum of six credits. Prereq: Completion of the University Writing requirement and consent of instructor.

ENG 405 EDITING ENGLISH PROSE. (3)
For students with substantial training in writing. Instruction and practice in editing and revising skills; practice in evaluating, revising, and editing both the student’s own writing and the prose works of others. Emphasis on developing critical intelligence and a sense of audience. Techniques of revision, verification of sources, preparation of manuscripts. Not for students with writing deficiencies. Prereq: ENG 305 or consent of instructor.

ENG 407 INTERMEDIATE WORKSHOP IN IMAGINATIVE WRITING (Subtitle required). (3)
Continued studies in the writer’s craft, focusing on student work, but with increased emphasis on outside reading. May be repeated under a different subtitle to a maximum of six credits. Prereq: ENG 207 and consent of instructor.

ENG 414G INTRODUCTION TO MODERN ENGLISH LINGUISTICS. (3)
A study of phonemics, morphemics, and syntax. Special attention will be given in laboratory sessions to practical applications. Credit will not be given to students who already have credit for either ANT 215 or ENG/LIN 211. Prereq: Junior standing.

ENG 418 HISTORY OF THE ENGLISH LANGUAGE. (3)
A survey of the historical development of English from its Indo-European origins to the present. Includes an investigation of the principal changes which have affected English phonology, morphology, syntax, semantics, and vocabulary, and of the ways in which these changes are reflected in contemporary English usage; and an examination of the socio-historical factors that have shaped the evolution of the English language.

ENG 420G STUDIES IN MEDIEVAL ENGLISH LITERATURE. (3)
Studies in Old English and/or Middle English literature, such as Middle English lyric and romance, heroic poetry in Old and Middle English, Middle English alliterative poetry, religious poetry of the Middle Ages. Topics announced the preceding semester. Readings from some texts will be in Modern English translation.

ENG 421G CHAUCER. (3)
Extensive readings in the principal works of Chaucer, with particular attention to The Canterbury Tales.

ENG 422G ENGLISH RENAISSANCE: 1500-1600. (3)
Literature of the English Renaissance exclusive of the drama. Foreign sources of the English Renaissance. Major writers such as More, Ascham, Wyatt, Sidney, Spenser, Raleigh, and Marlowe.

ENG 423G ENGLISH RENAISSANCE: 1600-1660. (3)
Selected nondramatic works of such writers as Bacon, Donne, Ben Jonson, George Herbert, Izak Walton, Herrick, Sir Thomas Browne, Vaughan, and Traherne.

ENG 425G SHAKESPEARE SURVEY. (3)
A study of ten to twelve of the major plays of Shakespeare, including comedies, tragedies, and histories and covering the important phases of his career.

ENG 426G SHAKESPEARE STUDIES (Subtitle required). (3)
Detailed study of a special topic in Shakespeare, such as Shakespeare’s tragedies, early Shakespeare, Shakespeare’s romantic comedies, Shakespeare and film. Topics announced the previous semester. May be repeated under different subtitles to a maximum of six credits.

ENG 428G MILTON. (3)
Extensive readings in Milton’s poetry and prose.

ENG 430G THE RESTORATION AND EARLY 18th CENTURY: 1660-1730. (3)
A survey of the rise of Classicism with emphasis on the works of Dryden, Pope, Swift, Addison and Steele.

ENG 431G THE LATER 18th CENTURY: 1730-1780. (3)
A survey of the transition from Classicism to Romanticism with emphasis on the works of Boswell, Johnson, Gray, Goldsmith, and Cowper.
### ENG 473G SURVEY OF WORLD FOLKLORE. (3)
A survey on a worldwide scope of types of folklore. Emphasis on folklore as a cultural phenomenon in its own right and upon its relations to literary types. The development of the science of folklore.

### ENG 476G APPALACHIAN FOLKLORE. (3)
The course, by discussions and lectures, provides definitions of the various genres of folklore comprising the traditional humanistic threads of the Appalachian sociocultural fabric, with emphasis upon the place of folklore in Appalachians’ lives.

### ENG 480G SPECIAL STUDIES IN FILM (Subtitle required). (3)
Study of special topics in film, such as directors, genres, film and literature, film theories, film movements. Viewing of films outside of class is required. Topics announced the preceding semester. May be repeated to a maximum of six credits with consent of instructor. Prereq: ENG 281 or 380 or consent of instructor.

### ENG 490G TOPICS OF GENDER IN LITERARY STUDIES (Subtitle required). (3)
Variable in content and context, this course focuses on any of several aspects of gender in literary studies, such as gender and genre, gender issues in a particular literary period, black women writers, feminist literary theory. May be repeated under different subtitles to a maximum of six hours.

### ENG 507 ADVANCED WORKSHOP IN IMAGINATIVE WRITING (Subtitle required). (3)
For the student who has shown marked talent and commitment, this course provides a more rigorous workshop among peers and includes additional attention to outside reading. Each student will produce a chapbook of poems or stories. May be repeated with the same subtitle to a maximum of six credits. Prereq: ENG 207 and ENG 407, or the equivalent, and consent of the instructor.

### ENG 509 COMPOSITION FOR TEACHERS. (3)
The basic studies helpful to teachers of composition. The teaching of grammar, punctuation, usage, etc., and of theme planning, correction, and revision. Students are required to do quite a bit of writing.

### ENG 510 AMERICAN ENGLISH. (3)
The varieties of modern American English: regional and social dialects, ethnic varieties, creoles, and argots. History and methods of American dialect study. Prereq: ENG/LIN 211 or ENG 414G or ANT 215 or the equivalent, or consent of instructor.

### ENG 512 MODERN ENGLISH GRAMMAR. (3)
Contemporary approaches to grammatical analysis; the interrelationships of phonology, morphology, and syntax. Prereq: ENG/LIN 211 or ENG 414G or ANT 215 or the equivalent; or consent of instructor.

### ENG 513 TEACHING ENGLISH AS A SECOND LANGUAGE. (3)
The course will examine the current theories and methods of teaching English as a second language. The course will include (1) language learning theory as it relates to other disciplines; (2) methods and techniques of contrastive analysis. Prereq: One course in linguistics or consent of instructor. (Same as EDC 513.)

### ENG 514 TESL MATERIALS AND METHODS. (3)
An extension of ENG/EDC 513, this course will include examination and evaluation of published materials designed for teaching English to speakers of other languages. Students will create individualized teaching materials and gain practical experience in applying the methods and using their own materials. Prereq: ENG/EDC 513 or consent of instructor. (Same as EDC 514.)

### ENG 515 PHONOLOGICAL ANALYSIS. (3)
An investigation of speech-sounds and systems of speech-sounds. Articulatory phonetics, analysis of phonological systems, phonological theories. Includes fieldwork on the phonology of a non-Indo-European language; within a given academic year, the same language serves as the basis for fieldwork in ANT/ENG/LIN 515 and ANT/ENG/LIN 516. Prereq: ENG/LIN 211 or equivalent. (Same as ANT/LIN 515.)

### ENG 516 GRAMMATICAL ANALYSIS. (3)
Emphasis on the systematic interrelationships of morphemes within words and sentences. Practical training in the writing of grammars and exposure to various theories of grammatical description. Includes fieldwork on the morphology and syntax of a non-Indo-European language; within a given academic year, the same language serves as the basis for fieldwork in ANT/ENG/LIN 515 and ANT/ENG/LIN 516. Prereq: ENG/LIN 211 or equivalent. (Same as ANT/LIN 516.)

### ENG 519 INTRODUCTION TO OLD ENGLISH. (3)
An introduction to Old English language and literature.

### ENG 562 COMPARATIVE LITERATURE: 17TH THROUGH 19TH CENTURY. (3)
A study in English of major works of continental European literature written in modern languages, especially French, German, Spanish, Italian, Russian, from mid-17th century to end of 19th century. (Same as CLT 562.)

### ENG 569 HISTORY OF LITERARY CRITICISM II. (3)
The theory and practice of modern literary criticism such as New Criticism, Formalism, structuralism, reader response, Marxism, deconstruction, psychoanalysis, and feminist criticism.

### ENG 570 SELECTED TOPICS FOR ADVANCED STUDIES IN LITERATURE (Subtitle required). (3)
Study of special topics that cut across the normal divisions of genre or periods, such as the relations of literature to other disciplines; metaphor and symbolism; interpretative theory. May be repeated to a maximum of six credits. Prereq: Junior standing or consent of instructor.

### ENG 572 STUDIES IN ENGLISH FOR TEACHERS (Subtitle required). (3)
Specialized studies designed to increase the teacher’s knowledge of subject matter and to enlarge his understanding of new developments and approaches to the teaching of English. May be repeated to a maximum of six credits.

### ENG 581 AESTHETICS OF FILM. (3)
An examination of theories of film. Emphasis on the establishment of criteria for the aesthetic response to film and the visual image. Viewing of films outside of class is required. Prereq: Another ENG film course or consent of instructor.

### ENG 600 BIBLIOGRAPHY AND METHODS OF RESEARCH. (3)
An introduction to descriptive and enumerative bibliography, textual criticism, and historical scholarship.

### ENG 609 COMPOSITION FOR TEACHERS. (3)
A course in the theory and practice of teaching English composition at the college level. Required of first-year teaching assistants in the Department of English, the course is structured to match the ordering of English 101 so that the practical work of college writing and the theoretical considerations of English 609 will be mutually reinforcing.

### ENG 610 STUDIES IN RHETORIC. (3)
This course introduces theories of rhetoric with readings drawn from major theoreticians and rhetoricians; applies theory to the practice of teaching college writing, with special emphasis on argumentation, the subject of English 102; and provides an opportunity for teaching assistants to get help from the teacher and from their peers in responding to and evaluating students’ written work. This course, required of second semester teaching assistants in the Department of English, continues the work of English 609. Prereq: ENG 609 or equivalent.

### ENG 617 STUDIES IN LINGUISTICS (Subtitle required). (3)
A comprehensive investigation of some designated topic in general or applied linguistics. May be repeated to a maximum of nine credits under different subtitles. Prereq: An introductory course in linguistics (ANT 215, ENG/LIN 211, or ENG 414G) or permission of instructor. (Same as LIN 617.)

### ENG 618 HISTORY OF THE ENGLISH LANGUAGE. (3)
An intensive study of the change of English from a synthetic to an analytic language, from its origin in Indo-European to its current stage of development. Emphasis is on changes in phonology, morphology, syntax, and semantics, from Old to Early-Modern English.

### ENG 619 BEOWULF. (3)
Translation and study of Beowulf. ENG 518 or ENG 519 recommended as background courses.

### ENG 620 STUDIES IN MIDDLE ENGLISH LITERATURE. (3)
A study in depth of selected writers and movements.

### ENG 621 STUDIES IN CHAUCER. (3)
A study in depth of selected works of Chaucer, especially Troilus, in relation to aspects of the medieval literary tradition.

### ENG 622 STUDIES IN ENGLISH LITERATURE: 1500-1600. (3)
Comprehensive study of broad topics, normally limited to an intensive survey of the literature and scholarship of the period as a whole.
### 1999-2000 Course Descriptions – E

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 623</td>
<td>STUDIES IN ENGLISH LITERATURE: 1600-1660.</td>
<td>3</td>
<td>Comprehensive study of broad topics, normally limited to an intensive survey of the literature and scholarship of the period as a whole.</td>
</tr>
<tr>
<td>ENG 625</td>
<td>STUDIES IN RENAISSANCE DRAMA EXCLUSIVE OF SHAKESPEARE.</td>
<td>3</td>
<td>A study in depth of selected writers.</td>
</tr>
<tr>
<td>ENG 626</td>
<td>STUDIES IN SHAKESPEARE.</td>
<td>3</td>
<td>A reading of Shakespeare’s work and an intensive study of a selection representative of the full range of his dramatic and nondramatic writing. Extensive reading in Shakespeare scholarship and criticism. Prereq: One of the following – ENG 425G, 426G, 427G, or equivalent.</td>
</tr>
<tr>
<td>ENG 628</td>
<td>STUDIES IN MILTON.</td>
<td>3</td>
<td>A study of all of Milton’s poetry and of his more important prose; readings from contemporary thinkers; studies in thought currents of the time and Milton’s relation to them.</td>
</tr>
<tr>
<td>ENG 630</td>
<td>STUDIES IN ENGLISH LITERATURE: 1660-1720.</td>
<td>3</td>
<td>Comprehensive study of broad topics, normally limited to an intensive survey of the literature and scholarship of the period as a whole.</td>
</tr>
<tr>
<td>ENG 631</td>
<td>STUDIES IN ENGLISH LITERATURE: 1720-1780.</td>
<td>3</td>
<td>Comprehensive study of broad topics, normally limited to an intensive survey of the literature and scholarship of the period as a whole.</td>
</tr>
<tr>
<td>ENG 635</td>
<td>STUDIES IN LITERATURE: 1780-1815.</td>
<td>3</td>
<td>A study in depth of selected writers and movements.</td>
</tr>
<tr>
<td>ENG 636</td>
<td>STUDIES IN LITERATURE: 1815-1830.</td>
<td>3</td>
<td>A study in depth of selected writers and movements.</td>
</tr>
<tr>
<td>ENG 638</td>
<td>STUDIES IN ENGLISH LITERATURE: 1830-1860.</td>
<td>3</td>
<td>Comprehensive study of broad topics, normally limited to an intensive survey of the literature and scholarship of the period as a whole.</td>
</tr>
<tr>
<td>ENG 639</td>
<td>STUDIES IN ENGLISH LITERATURE: 1860-1900.</td>
<td>3</td>
<td>Comprehensive study of broad topics, normally limited to an intensive survey of the literature and scholarship of the period as a whole.</td>
</tr>
<tr>
<td>ENG 640</td>
<td>STUDIES IN THE 19th CENTURY BRITISH NOVEL.</td>
<td>3</td>
<td>A study in depth of selected writers. Prereq: Graduate standing.</td>
</tr>
<tr>
<td>ENG 642</td>
<td>STUDIES IN MODERN BRITISH LITERATURE.</td>
<td>3</td>
<td>Selected writers, works, and movements in the modern period with concentration on the period from 1890 to 1945.</td>
</tr>
<tr>
<td>ENG 643</td>
<td>STUDIES IN MODERN BRITISH AND AMERICAN POETRY.</td>
<td>3</td>
<td>Selected poets from England and America, with a major concentration on the period 1890-1945.</td>
</tr>
<tr>
<td>ENG 651</td>
<td>STUDIES IN AMERICAN LITERATURE BEFORE 1860.</td>
<td>3</td>
<td>A study in depth of selected writers and movements.</td>
</tr>
<tr>
<td>ENG 652</td>
<td>STUDIES IN AMERICAN LITERATURE: 1860-1900.</td>
<td>3</td>
<td>A study in depth of selected writers and movements.</td>
</tr>
<tr>
<td>ENG 653</td>
<td>STUDIES IN AMERICAN LITERATURE SINCE 1900.</td>
<td>3</td>
<td>A study in depth of selected writers and movements.</td>
</tr>
<tr>
<td>ENG 656</td>
<td>BLACK AMERICAN LITERATURE.</td>
<td>3</td>
<td>An in-depth study of black American literature, with concentration on major texts by major black writers. (Same as AAS 656.)</td>
</tr>
<tr>
<td>ENG 660</td>
<td>MODERN CRITICAL THEORY.</td>
<td>3</td>
<td>Detailed examination of one or another topic in contemporary theory of interpretation, such as literature and analytical philosophy, phenomenology and literature, structuralism, Marxism, psychoanalysis.</td>
</tr>
<tr>
<td>ENG 681</td>
<td>STUDIES IN FILM.</td>
<td>3</td>
<td>Comprehensive study of the history, theory, and criticism of film, with concentration on a series of major American and foreign films. Viewing of films outside of class is required.</td>
</tr>
<tr>
<td>ENG 682</td>
<td>STUDIES IN FICTION.</td>
<td>3</td>
<td>A study in depth of selected types of fiction.</td>
</tr>
<tr>
<td>ENG 683</td>
<td>STUDIES IN DRAMA.</td>
<td>3</td>
<td>A study in depth of selected types of drama.</td>
</tr>
<tr>
<td>ENG 684</td>
<td>STUDIES IN POETRY.</td>
<td>3</td>
<td>A study in depth of selected types of poetry. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 690</td>
<td>STUDIES IN LITERATURE AND GENDER (Subtitle required).</td>
<td>3</td>
<td>This course focuses on gender as a primary category for literary analysis. Topics will vary, from a group of authors, an historical period or an aesthetic movement, to a genre, a theme, or an aspect of literary theory. May be repeated under different subtitles to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 691</td>
<td>READINGS IN RHETORIC (Subtitle required).</td>
<td>1</td>
<td>This reading course allows graduate students to integrate readings in Rhetoric and Composition scholarship and provides an opportunity to discuss research with faculty associated with Rhetoric and Composition. In addition to readings, students will be expected to keep a reading journal or complete a brief annotated bibliography. May be repeated to a maximum of three credits. Prereq: ENG 609 and ENG 610 or consent of instructor.</td>
</tr>
<tr>
<td>ENG 700</td>
<td>TUTORIAL FOR PH.D. CANDIDATES.</td>
<td>3</td>
<td>In addition to its proseminar and seminar schedule of courses, the English Department offers its Ph.D. students the opportunity to investigate, by tutorial, topics that cannot be handled as well in a classroom setting. The purpose of the tutorial is to enable a student to work intensively with a specialist on the kind of topics that lead to professional research, including dissertations. Unlike independent study, the tutorial involves both instructor and students in a mutual investigation of little-studied topics. An ultimate aim is to present students with possibilities for dissertation topics. May be repeated to a maximum of six credits. Prereq: Admission to the Ph.D. program and instructor’s consent.</td>
</tr>
<tr>
<td>ENG 710</td>
<td>SEMINAR IN MEDIEVAL LITERATURE.</td>
<td>3</td>
<td>Recent topics: medieval fiction; Chaucer and the Gothic mind. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 722</td>
<td>SEMINAR IN 16TH CENTURY LITERATURE.</td>
<td>3</td>
<td>Recent topics: Spenser; Elizabethan drama. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 723</td>
<td>SEMINAR IN 17TH CENTURY LITERATURE.</td>
<td>3</td>
<td>Recent topics: Donne; Herbert; Milton. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 726</td>
<td>SEMINAR IN SHAKESPEARE.</td>
<td>3</td>
<td>Seminar in Shakespeare. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 730</td>
<td>SEMINAR IN 18TH CENTURY LITERATURE.</td>
<td>3</td>
<td>Recent topics: neoclassic satire. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 735</td>
<td>SEMINAR IN ROMANTIC LITERATURE.</td>
<td>3</td>
<td>Recent topics: Keats; Wordsworth. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 738</td>
<td>SEMINAR IN VICTORIAN LITERATURE.</td>
<td>3</td>
<td>Seminar in Victorian literature. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 740</td>
<td>SEMINAR IN 20TH CENTURY BRITISH LITERATURE.</td>
<td>3</td>
<td>Seminar in 20th century British literature. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 748</td>
<td>MASTER’S THESIS RESEARCH.</td>
<td>0</td>
<td>Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.</td>
</tr>
<tr>
<td>ENG 749</td>
<td>DISSERTATION RESEARCH.</td>
<td>0</td>
<td>Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.</td>
</tr>
<tr>
<td>ENG 750</td>
<td>SEMINAR IN COLONIAL LITERATURE.</td>
<td>3</td>
<td>Seminar in Colonial Literature; may be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 751</td>
<td>SEMINAR IN AMERICAN LITERATURE: 1800-1860.</td>
<td>3</td>
<td>Seminar in American literature 1800-1860. Recent topics: Emerson and Melville; Hawthorne. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>ENG 752</td>
<td>SEMINAR IN AMERICAN LITERATURE: 1860-1900.</td>
<td>3</td>
<td>Seminar in American literature 1860-1900. Recent topics: Whitman and Dickinson. May be repeated to a maximum of six credits.</td>
</tr>
</tbody>
</table>
ENT 564 INSECT TAXONOMY. (3)
A detailed coverage of the insects and mites attacking turf, ornamentals, greenhouse plantings, vegetables and fruits, with emphasis on field recognition of the pests and their damage. Lecture, two hours per week; laboratory, two hours per week.

ENT 340 LIVESTOCK ENTOMOLOGY. (2)
Biology and behavior of insects and other pests attacking livestock, poultry, pets and wildlife. Current control methods are discussed. For students interested in livestock production, farm management, dairy science, poultry science, and preveterinary medicine, as well as general agriculture.

ENT 360 GENETICS. (3)
The basic principles of heredity as currently understood from evidence accumulated in classical, cytogenetic, molecular, and quantitative genetic experiments. Emphasis is placed on a thorough understanding of genetic principles and their relationship to all biological disciplines. Prereq: Six credits in biological sciences and one course in general chemistry. (Same as ABT/ASC 360.)

ENT 395 INDEPENDENT WORK. (2-3)
Special problems for individual students who are capable of pursuing independent investigations in the various areas of entomology. May be repeated to a maximum of six credits. Prereq: ENT 300.

ENT 399 FIELD BASED/COMMUNITY BASED EDUCATION. (1-6)
Field-based or community-based experience in entomology under supervision of a faculty member. Pass/Fail only. Prereq: Permission of faculty member and department chairperson and completion of a departmental learning agreement before registration.

ENT 402 FOREST ENTOMOLOGY. (3)
The principles of forest entomology, including the detection, collection, identification, appraisal of damage, and control of forest insect pests. Lecture, two hours; laboratory, two hours. Prereq: One year of biology or consent of instructor. (Same as FOR 402.)

ENT 460 INTRODUCTION TO MOLECULAR GENETICS. (2)
Molecular genetics is the study of the biochemical basis of heredity and focuses on the structure and expression of DNA at the molecular and cellular level. The course will provide a detailed understanding of the biochemical events involved in replication, prokaryotic and eukaryotic transcription, and translation of DNA, as well as RNA processing, recombination, and the theoretical underpinnings of genetic engineering. Prereq: AGR 360 or BIO 404G or consent of instructor. (Same as ABT 460.)

ENT 461 INTRODUCTION TO POPULATION GENETICS. (2)
This survey course examines the population dynamics and equilibrium of genes in nuclear, chloroplasts and mitochondria. Emphasis will be on biological relevance (in plants, animals, and micro-organisms), but some theoretical derivations will also be introduced. Prereq: AGR 360 (or equivalent) and one course in probability/statistics. (Same as ABT/BIO/FOR 461.)

*ENT 530 INTEGRATED PEST MANAGEMENT. (3)
Principles of insect damage, populations and distributions. Various types of natural and applied control, including problems of insecticide toxicity, resistance and residues. Prereq: ENT 300 or ENT 310 or ENT 320.

ENT 561 MEDICAL ENTOMOLOGY. (4)
Study of arthropod vectors of disease. Structure, collection, identification, control measures and life history studies. Given alternate years. Prereq: one year of biology. (Same as BIO 561.)

ENT 563 PARASITOLOGY. (4)
Protozoan, helminth and arthropod parasites of man and domestic animals, emphasis on etiology, epidemiology, methods of diagnosis, control measures, and life histories. Techniques for host examination and preparation of material for study. Prereq: BIO 150, 151, 152, 153 or consent of instructor. (Same as BIO 563.)

ENT 564 INSECT TAXONOMY. (4)
A study of insect taxonomy including the collection, preparation, and identification of adult insect specimens. Prereq: Consent of instructor. (Same as BIO 564.)
ENT 658 INSECT BEHAVIOR. (3)
The principles of animal behavior will be stressed using insects as examples. Physiology, mechanisms, behavioral ecology and evolution of insect behavior will be covered. Prereq: One year of biology. (Same as BIO 568.)

*ENT 605 EMPIRICAL METHODS IN ECOLOGY AND EVOLUTION. (2)
This course provides students with hands-on experience in a diverse array of modern research methods used by ecologists and evolutionary biologists, including techniques used in: molecular genetics, chemical ecology, behavioral studies, motion analyses, using high-speed video, image analyses for morphometrics and color, and field techniques in both aquatic and terrestrial systems. Lecture, one hour; laboratory, three hours per week. Prereq: BIO 325 or FOR 340 or ENT 665, or consent of instructor. (Same as BIO/FOR 605.)

*ENT 606 CONCEPTUAL METHODS IN ECOLOGY AND EVOLUTION. (2)
This course provides students with hands-on experience in a diverse array of conceptual research techniques used by ecologists and evolutionary biologists. The focus will be on optimization methods used for predicting animal and plant behaviors and life histories, and on methods for assessing population trends and dynamics. Mathematical techniques used will include graphical analyses, matrix algebra, calculus, and computer simulations. Prereq: One year of calculus and BIO 325 or FOR 340 or ENT 665, or consent of instructor. (Same as BIO/FOR 606.)

*ENT 607 ADVANCED EVOLUTION. (2)
This course covers advanced topics in evolution, concentrating on questions central to the understanding of general evolutionary processes. Phenomena occurring both within populations (e.g., selection, inheritance, population subdivision) and between populations (e.g., gene flow, competition) will be addressed. Special attention will be given to modern research approaches and techniques including quantitative genetics, measurement of selection, phylogenetic analyses of comparative data and molecular systematics. Prereq: BIO 325 and one semester of calculus; or consent of instructor. (Same as BIO/FOR 607.)

ENT 608 BEHAVIORAL ECOLOGY AND LIFE HISTORIES. (3)
This course uses an evolutionary approach to examine behavior and life histories. Topics addressed include: the optimality approach, constraints on optimality, kin and group selection, predator and prey behaviors, social and mating behaviors, and life history evolution. Prereq: BIO 325 and one semester of calculus; or consent of instructor. (Same as BIO/FOR 608.)

ENT 609 POPULATION AND COMMUNITY ECOLOGY. (3)
This course discusses the processes that determine population distributions and dynamics and community structure for both plants and animals. Topics addressed include: population regulation and population stability, community diversity and stability, ecological succession, population interactions (competition, predation, mutualism), coevolution, and the effects of spatial and temporal heterogeneity on population and community patterns. Prereq: BIO 325 or FOR 340 or consent of instructor. (Same as BIO/FOR 609.)

ENT 613 BEHAVIORAL ECOLOGY AND COMPARATIVE NEUROBIOLOGY. (2)
This course introduces students to major topics in behavioral ecology and comparative neurobiology with an emphasis on inter-relationships between these fields. Topics to be covered vary each semester, but typically include: the optimality approach to understanding behavior, predator-prey behavior, mating and social behavior, behavioral genetics, neural circuits and behavior, sensory biology, neural development, and neural plasticity. Prereq: Permission of the instructor. (Same as ANA/BIO/PGY/PSY 613.)

ENT 614 TECHNIQUES IN BEHAVIORAL ECOLOGY AND COMPARATIVE NEUROBIOLOGY. (2)
This course provides students with instruction and experience in the experimental research techniques employed in the study of behavioral ecology and comparative neurobiology with emphasis on the integration of these approaches for understanding animal behavior. Each student will carry out three small research projects in the laboratories of three of the participating faculty. Techniques to be covered include: molecular and genetic methods, neuroanatomical and neurophysiological techniques, and field and laboratory methods for quantifying behavior and studying effects of social and environmental influences on behavior. Prereq: Permission of the instructor. (Same as ANA/BIO/PGY/PSY 614.)

ENT 625 INSECT-PLANT RELATIONSHIPS. (3)
This course examines the natural history, ecology, and evolution of insect-plant relationships. Topics include mechanisms and theory of plant defense, behavioral and physiological adaptations of herbivorous insects, pollination biology, multitrrophic-level interactions, causes of insect outbreaks, and applications to managed ecosystems. Critical reading and discussion of current literature is emphasized. Prereq: Two years of college-level biology. (Same as BIO 625.)

ENT 626 INSECT PATHOLOGY. (3)
Principles of insect pathology related to the etiology, pathogenesis, sympotmology, gross pathology, histopathology, and epizootiology of insect diseases with emphasis on infectious diseases caused by occluded viruses, bacteria, fungi, and protozoans. Lecture, two hours; laboratory, two hours. Prereq: Consent of instructor.

ENT 635 INSECT PHYSIOLOGY AND INTERNAL MORPHOLOGY. (4)
Principles of insect physiology, function of organs, circulation, reproduction, respiration, neurophysiology, endocrinology and digestion. Internal morphology will be studied as it relates to function. Lecture, three hours; laboratory, two hours. Prereq: Consent of instructor. (Same as BIO 635.)

ENT 660 IMMATURE INSECTS. (3)
Bionomics, structure and classification of immature stages of insects; practice in their identification. Lecture, one hour; laboratory, six hours. Prereq: BIO 570 or ENT 564, or consent of instructor.

ENT 665 INSECT ECOLOGY. (3)
The biotic and physical factors influencing the distribution and abundance of insects and insect populations. Prereq: Consent of instructor. (Same as BIO 665.)

ENT 670 EXPERIMENTAL METHODS IN ENTOMOLOGY – FIELD. (2)
The principles and techniques of field entomological research with emphasis on problem selection and the collection, evaluation, and presentation of data. Lecture, two hours; laboratory, four hours. Taught first half of the semester.

ENT 671 EXPERIMENTAL METHODS IN ENTOMOLOGY – LABORATORY. (2)
The principles and techniques of instrumentation in laboratory entomological research with evaluation and presentation of data. Two class hours; four laboratory hours. Taught second half of the semester.

ENT 680 BIOLOGICAL CONTROL. (3)
Principles related to the use of arthropods to suppress populations of arthropod pests and weeds. Includes historical perspective, ecological relationships, and contemporary issues related to the conservation and manipulation of arthropod predators, parasitoids, and herbivores. Prereq: ENT 300 or equivalent.

ENT 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

ENT 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

ENT 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

ENT 769 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE. (0-12)
May be repeated indefinitely.

ENT 770 ENTOMOLOGICAL SEMINAR. (1)
Discussion of current research problems in entomology. May be repeated to a maximum of six hours.

ENT 780 SPECIAL PROBLEMS IN ENTOMOLOGY AND ACAROLOGY. (2-3)
Investigations of chosen insect problems, including original work. Discussion and assignment of current insect subjects. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

ENT 790 RESEARCH IN ENTOMOLOGY AND ACAROLOGY. (1-6)
Independent research in entomology or acarology. May be repeated to a maximum of 12 hours. Prereq: Consent of instructor.
EPE 301 EDUCATION IN AMERICAN CULTURE. (3)
Critical examination of contending views, past and present, regarding the nature and role of educational institutions in American society as well as proposed purposes and policies for schools and other educational agencies.

EPE 317 HISTORY OF EDUCATION. (3)
A study of the historical foundations of American education.

EPE 454 CULTURE, EDUCATION AND TEACHING ABROAD. (3)
Introduction to the social, political, economic, and educational institutions of another country in preparation for student teaching in that country. The process and problems of adjusting to life in another culture will be included as well as instruction in the language of the host country as needed. Faculty from other departments in the University will be used as well as informants from the country involved. Lecture, three hours per week; laboratory, two hours per week for language practice. Prereq: Permission of instructor for students outside of the College of Education. (Same as EDC 454.)

EPE 525 SPECIAL TOPICS SEMINAR IN EDUCATIONAL POLICY STUDIES AND EVALUATION (Subtitle required). (3)
Examination of selected topics in educational policy studies and evaluation. May be repeated to a maximum of six credits but no more than three may be earned under the same subtitle. Prereq: Consent of instructor.

EPE 555 COMPARATIVE EDUCATION. (3)
Analytic and comparative study of contemporary education in selected countries, with emphasis on the historical development and total cultural context of educational programs in non-Western countries. Informal as well as formal agencies and programs will be studied with particular attention to recent reforms and innovations. Prereq: Junior, senior or graduate status, or consent of instructor.

EPE 570 GATHERING, ANALYZING, AND USING EDUCATIONAL DATA. (3)
An introductory course in the analysis of educational and evaluation data. An emphasis on exploratory data analysis and interpretation of results in the broad contexts of education and evaluation. Lecture, two hours; laboratory, two hours per week. Prereq: Undergraduates must have the consent of the instructor.

EPE 601 PROSEMINAR. (1)
Introductory survey of the bibliographic parameters and research approaches to educational policy studies and evaluation. Graduate faculty resources and typical research problems are introduced. Emphasis upon significance and importance of thesis writing and dissertation in graduate studies. Required, first semester of study, for all degree students in the department. Prereq: Graduate standing or consent of instructor.

EPE 603 EDUCATIONAL POLICY ANALYSIS: AN INTRODUCTION. (3)
Examination of the basic aspects of educational policy analysis. Emphasis upon major issues endemic to the pursuit of rational policy formulation in democratic politics. Prereq: Graduate standing or consent of instructor.

EPE 612 INTRODUCTION TO HIGHER EDUCATION. (3)
This course is intended to give the student a broad overview of contemporary higher education. The course examines major trends, issues, and problems facing colleges and universities from a variety of perspectives, including historical, administrative, public policy, governance, and faculty. The primary objectives of the course are to assist the student in developing an understanding of 1) various components and operations of higher education and 2) the interaction of these components and operations.

EPE 620 TOPICS AND METHODS OF EVALUATION. (3)
An examination of a subset of evaluation methods, topics, and problems. An introductory course in the area with minimal emphasis on quantitative methods. The course is designed to provide a perspective from which evaluation studies may be viewed; and, to provide experiences for those who will learn from or conduct evaluations. Prereq: Consent of instructor, and a basic course in statistics or research. (Same as ANT/EDP 620/SOC 622.)

EPE 621 ADVANCED TOPICS AND METHODS OF EVALUATION. (3)
An advanced course in evaluation methods and techniques with an emphasis on quantitative methodology. State of the art ideas and methods of conducting evaluation studies and analyzing data from those studies are presented. The course is designed primarily for those who are conducting or will conduct evaluation studies. Prereq: A basic course in statistics or its equivalent; EDP/EPE 620/SOC 622; and consent of instructor. (Same as ANT/EDP 621.)

EPE 622 COLLEGE AND UNIVERSITY FACULTY. (3)
This course considers college and university faculty in their roles as researchers, teachers, and community/institutional servants. The class considers from various theoretical perspectives and disciplines who faculty are, what they do, and how they relate to the environments and cultures in which they work. Prereq: EPE 612 or consent of instructor.

EPE 628 ETHICS AND EDUCATIONAL DECISION MAKING. (3)
Examination of ethical theories upon which educational evaluations are based and upon which they become the basis for educational policies. Theories considered include classical and rule utilitarianism, Rawlsian social justice, behavioristic, critical, and hermeneutic theories of value. Prereq: EPE 603 or consent of instructor.

EPE 632 STUDENT SERVICES. (3)
This course focuses on students services (broadly defined) and those who work with college and university students outside of the academic arena. The course not only surveys the history of student services but critically examines its theoretical bases and current practices with special attention paid to the relationship between students services and other segments of campus. Prereq: EPE 612 or consent of instructor.

EPE 640 PHILOSOPHY OF EDUCATION. (3)
The course is designed to enhance the professional educator’s competence in analyzing and evaluating educational policies and programs. Theoretical frameworks, philosophical methods, and current educational debates are examined. May be repeated once to a maximum of six credits. Prereq: Twelve semester hours in education or permission of instructor.

EPE 650 HISTORY OF WESTERN EDUCATION. (3)
A study of the development of the “institution” of education in relation to social and political reality, ideas, and ideals of successive periods in Western culture.

EPE 651 HISTORY OF EDUCATION IN THE UNITED STATES. (3)
A history of the growth and development of education in the United States from earliest colonial times to the present, including recent movements and trends.

EPE 652 HISTORY OF EDUCATIONAL THOUGHT. (3)
Description and critical examination of the core ideas of leading educational theorists in the history of Western culture. Emphasis upon the societal and cultural conditions in which the ideas emerged, and the relevance of these ideas to contemporary educational policy concerns.

EPE 653 HISTORY OF HIGHER EDUCATION. (3)
Social and institutional history of higher education which will include selected topics in European culture and education and which will emphasize the development of the American college and university.

EPE 661 SOCIOLGY OF EDUCATION. (3)
A study of schooling and education using basic analytic paradigms of sociology. Emphasis on schools as formal organizations and education in a changing, technologically oriented and stratified society. Prereq: SOC 101 or equivalent. (Same as SOC 661.)

EPE 663 FIELD STUDIES IN EDUCATIONAL INSTITUTIONS. (3)
Field research in an educational setting. Questions of theory, method, and application examined. Students plan and implement a study under faculty supervision. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

EPE 665 EDUCATION AND CULTURE. (3)
An analysis of the cultural role and function of educational institutions and processes. Topics considered include schooling as cultural transmission, the community context of education, cross-national studies of schools, and implications of anthropological approaches for teacher training.
EPE 667 EDUCATION AND GENDER. (3)
The course examines the relationships between gender and education in U.S. society. The focus will be on the formation and enactment of gender within social and educational institutions. Using a variety of source materials and theories, we will address the following questions. How and what do educational institutions teach about gender? And how do females and males respond to these learning contexts? In what ways are social class, race and ethnicity important to engendering our lives? How does schooling contribute to the differential experiences of women and men in their transitions to adult work in the domestic and waged labor forces? How can education contribute to societal changes in sex equity?

EPE 670 POLICY ISSUES IN HIGHER EDUCATION. (3)
A survey of modern tendencies in higher education; scope and development, objectives, organization, administration, curricula, finance, faculty and student personnel. Designed primarily for prospective college administrators, teachers, and registrars.

EPE 672 COLLEGE TEACHING AND LEARNING. (3)
A study of all phases of instruction at the college level. The course will include methods and principles of teaching, utilization of materials in teaching, a consideration of the teaching-learning process as it relates to the individual student, and the evaluation of student progress. A comprehensive course for prospective college teachers.

EPE 674 THEORIES OF STUDENT DEVELOPMENT. (3)
A study of college student behavior, relationship of student personnel to total college program, organization and administration, evaluation, and research of college student personnel.

EPE 676 ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION. (3)
Objectives, organization, administration, inter-institutional cooperation, allocation of financial resources, state systems of higher education.

EPE 678 ECONOMICS OF HIGHER EDUCATION. (3)
This course addresses issues of equity and efficiency by analyzing 1) how students, faculty and institutions are influenced by markets and incentives, 2) the economic impact of higher education on students and society, and 3) the financial management of institutions.

EPE 679 MULTIPLE MEASURES IN EDUCATION AND EVALUATION. (3)
Quantitative techniques for dealing with multiple measures of persons, programs, or products. Appropriate techniques for pretest-posttest designs, multiple outcome variables, measures, reliability, time series and other situations where there are multiple measurements. Prereq: EPE 621 or its equivalent.

EPE 680 POLITICS OF HIGHER EDUCATION. (3)
Survey and analysis of the political forces and processes which influence the development and implementation of higher education policies, financing and programs at the federal, state and institutional levels.

EPE 681 HISTORY OF THE UNIVERSITY: GOVERNANCE AND ITS LEGAL CONTEXT. (3)
Identification and analysis of the legal and governance issues in medieval, reformation and American colonial universities and their implications for contemporary issues of governance, autonomy and academic freedom.

EPE 682 HIGHER EDUCATION AND THE LAW. (3)
Case analysis regarding the university as a legal entity, private universities, the constitutionally autonomous university and other public universities, faculty rights, student rights, miscellaneous issues. Prereq: EPE 681 or consent of instructor.

EPE 683 AFFIRMATIVE ACTION AND FEDERAL REGULATION OF HIGHER EDUCATION. (3)
Affirmative Action as a legal concept; history and current application; sexual harassment; special codes; higher education desegregation cases and other miscellaneous issues including equal protection, age discrimination, ADA and the Rehabilitation Acts. Prereq: EPE 682 or consent of instructor.

#EPE 684 HIGHER EDUCATION AND ATHLETICS: A HISTORICAL ANALYSIS. (3)
Historical analysis of the politics, economics and philosophical implications of intercollegiate athletics programs as part of the American college and university.

#EPE 685 THE RESEARCH UNIVERSITY. (3)
Historical analysis of the changing character, missions and roles of research universities in the United States. Emphasis will be on critical examination of large-scale sponsored research and graduate programs.

EPE 690 THE COMMUNITY COLLEGE. (3)
Comprehensive analysis of community colleges: history, current activity and future; demography, budget, administration. Prereq: EPE 612 or consent of instructor.

EPE 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

EPE 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

EPE 763 ADVANCED FIELD STUDIES. (3)
This course continues an exploration of qualitative research methods in the study of education. It focuses on advanced data collection techniques and particularly on methods of data analysis, representation and writing. The course revolves around an experiential core of individual student research projects. May be repeated to a maximum of six credits. Prereq: EPE 663, other introductory qualitative research methods courses or instructor's permission.

EPE 768 RESIDENCE CREDIT FOR THE MASTER'S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

EPE 769 RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE. (0-12)
May be repeated indefinitely.

EPE 773 SEMINAR IN EDUCATIONAL POLICY STUDIES AND EVALUATION. (1-3)
Independent study experience for advanced graduate students to investigate special problems and conduct research in educational policy studies and evaluation. Prereq: Permission of department chairperson required.

EPE 777 SEMINAR IN HISTORY OF EDUCATION IN KENTUCKY. (3)
Emphasis upon implications of major trends in national historiography for needed research in education in Kentucky. Prereq: A graduate-level course in the history of education or consent of instructor.

EPE 785 INDEPENDENT STUDIES IN EDUCATIONAL POLICY STUDIES AND EVALUATION. (1-3)
Independent study experience for advanced graduate students to investigate special problems and conduct research in educational policy studies and evaluation. Prereq: Permission of department chairperson required.

EPE 790 INTERNSHIP IN EDUCATIONAL POLICY STUDIES AND EVALUATION. (1-6)
Formal assignment to an evaluation and/or policy analysis project in an appropriate educational setting. Student’s work directed and evaluated by both departmental faculty and on-site supervisor. Laboratory, 5-20 hours per week. May be repeated to a maximum of 12 credits. Prereq: Twelve hours graduate course work in the department and permission of the director of graduate studies.

EPE 798 SEMINAR IN HIGHER EDUCATION. (3)
A critical study of selected problems in higher education. May be repeated to a maximum of nine credits but no more than three credits may be earned under the same title. Prereq: Consent of instructor.

**ER**

**Emergency Medicine**

**ER 825 SECOND-YEAR ELECTIVE, EMERGENCY MEDICINE.** (1-4)
With the advice and approval of his or her faculty adviser, the second-year student may choose approved electives offered by the Department of Emergency Medicine. The intent is to provide the student an opportunity for exploration and study in an area which supplements and or complements required course work in the second-year curriculum. Pass-fail only. Prereq: Admission to second-year medical curriculum and approval of adviser.

**ER 843 EMERGENCY MEDICINE.** (4)
This course will provide the students with an introduction to the field of Emergency Medicine, Emergency Medical Services (EMS), and the approach to the acutely ill or injured patient. The students will complete an ACLS class during this rotation. Laboratory, 40 hours per week. Prereq: Admission to fourth year of medical curriculum. (Same as MD 843.)
ER 850-899 FOURTH-YEAR ELECTIVE
FOR MEDICAL STUDENTS. (1-6)
With the advice and approval of the faculty adviser and the Student Progress and Promotions Committee, the fourth-year student may choose approved electives offered by the various departments in the College of Medicine. The intent is to provide the student an opportunity to develop his fund of knowledge and clinical competence. Prereq: Admission to the fourth year, College of Medicine and/or permission of the Student Progress and Promotions Committee.

Approved electives:
ER 850 FOURTH-YEAR ELECTIVE EMERGENCY MEDICINE
ER 853 RESEARCH IN EMERGENCY MEDICINE
ER 890 EMERGENCY MEDICINE OFFSITE

ES Environmental Systems

ES 600 ENVIRONMENTAL SYSTEMS SEMINAR. (1)
A series of presentations by experts in the field on environmental systems topics including topics from the fields of law, economics, social sciences, medicine, biology, engineering and physical sciences. May be repeated to a maximum of two credits.

ES 610 ENGINEERING AND PHYSICAL SCIENCES IN ENVIRONMENTAL SYSTEMS. (3)
Earth systems: environmental impacts of natural and human processes; the role of water systems on the earth including surface water systems, groundwater systems, and water quality and contamination systems; the role of atmospheric systems on earth including the nature and source of air pollutants, meteorological principles, radiation balance, climatology and air pollution, and air pollution control methodology; and processes and principles involved in waste producing organizations. Prereq: Freshman chemistry.

ES 620 NATURAL, BIOLOGICAL AND MEDICAL SCIENCES IN ENVIRONMENTAL SYSTEMS. (3)
A survey course for students outside the biological and medical sciences. Concepts in environmental systems, toxicology, ecology and the environment, ecotoxicology and environmental health. Prereq: A background in physical sciences or introductory biology and chemistry.

ES 630 LEGAL, SOCIAL AND ECONOMIC SCIENCES IN ENVIRONMENTAL SYSTEMS. (3)
Jurisprudential history, ethics and rule of law, environmental economics, history of science, governmental structures, process for development and enforcement of standards, social/political implications of environmental systems, regulatory schemes for environmental control.

EXP Experiential Education

EXP 396 EXPERIENTIAL EDUCATION. (1-12)
A community-based or field-based learning experience under the supervision of a faculty member. May be repeated to a maximum of 30 credits. Pass/fail with departmental permission required for letter grade. Prereq: Completion of departmental learning agreement and filing of the agreement in OEE. Consent of major department chairperson and instructor required.