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# **Graduate Course of Instruction**

## Course of Instruction *Accounting*

Traditional Graduate courses are offered at two levels. Courses at the 400 level are open to graduate students and to a limited number of qualified undergraduates; 500, 600 and 700-level courses are open, in most cases, to graduate students only. For the convenience of graduate students involved in daytime professional work, most courses are scheduled Monday through Thursday between 4 and 10 p.m.; both 400, 500, 600 and 700-level courses (3 credit) meet either for a single 150-minute period or for two regular 75-minute periods, depending upon the nature of the course and the policy of the department. There are also alternative scheduling options available, such as weekend, online and blended classes. These policies do not apply to the College of Chiropractic, the College of Naturopathic Medicine, the Acupuncture Institute or the Nutrition Institute.

Some graduate courses are offered every year, but many are scheduled over a two-year or three-year cycle. It is, therefore, essential that graduate students should carefully plan entire programs with their graduate advisors so that they will be able to register for all required courses over the time span in which they expect to complete the degree. The University reserves the right to limit the number of students registered in any graduate course, and also the right to cancel any course for which there is insufficient enrollment.

### **Accounting**

ACCOUNTING 600

#### **Financial Accounting**

This course is an introduction to American financial accounting principles based on FASB and IASB, including the measurement, processing, and communication of accounting information. Users of such accounting information include business owners, managers, creditors, prospective investors, and others interested in the financial condition of an entity and the results of its operations. Topics covered include the accounting cycle, merchandising, services, fixed assets and corporate accounting issues. Prerequisite: Admission to graduate study.

3 semester credits

ACCOUNTING 610

#### **Intermediate Accounting**

This course applies generally accepted accounting principles to the preparation of financial statements, including balance sheets, income statements, statement of cash flows, and retained earnings statements. Accounting for leases, employee benefits, deferred taxes and other specialized accounting topics will also be explored. Prerequisites: ACCT 600 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 620

#### **Managerial and Cost Accounting**

This course provides an introduction to managerial and cost accounting used by management in conducting daily operations, planning future operations, and developing overall business strategies. The objective is to gain an understanding of the role of accounting in the management process of planning, directing, controlling, and improving the organization's objectives (goals) and to translate those objectives into a course of action. Prerequisites: ACCT 600 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 625

#### **Auditing**

This course examines laws and methods for conducting commercial audits. Ethics, attestation standards, controls and fraud detection are among the topics that will be discussed. Application of generally accepted account-

ing practices to the review of financial statements, as well as the responsibility of the certified public accountant to the various users of the statements will also be explored. Prerequisites: ACCT 600, ACCT 610 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 630

#### **Advanced Financial Accounting**

This course is an overview of selected accounting topics of interest to international business students. Topics include current practice in accounting for business mergers or acquisitions, accounting for stock investments in affiliated companies, an introduction to consolidated financial statements, accounting for branch operations and an introduction to accounting for state and local governmental units. Prerequisites: ACCT 600, 610 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 633

#### **Personal Taxation**

This course is an overview of the major types of personal taxes used by governments to raise revenue. Emphasis is placed on the taxation of individuals and tax planning considerations for the individual. Prerequisites: ACCT 600 and completion of all core courses or concurrent registration in final core courses.

3 semester credits

ACCOUNTING 702

#### **Business Entity Taxation**

This course is an overview of the major types of corporate and business entity taxes used by governments to raise revenue. An emphasis is placed on the tax issues of different business forms, tax management and tax planning considerations for the business entity. Prerequisites: ACCT 600, ACCT 633 and completion of all required Accounting concentration courses or concurrent registration in final required concentration courses.

3 semester credits

ACCOUNTING 704

#### **Financial Reporting and Analysis**

This course is an overview of generally accepted accounting principles underlying the content of financial statements including alternative inventory valuation methods, lease accounting, segment reporting and reporting

## Accounting • Acupuncture

for employee benefit plans. Students study and analyze corporate annual reports and government and not-for-profit financial statements. Prerequisites: ACCT 600, ACCT 610, ACCT 630 and completion of all required accounting concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

ACCOUNTING 706

### International Accounting

This course examines the diverse accounting practices employed by different countries and their effects on multi-national firms' operation, as well as efforts to standardize IASB/FASB rules. Performance evaluation in multi-national enterprises, impact of differences in national accounting principles and practices, and accounting under central planning is also examined. Discussion topics include the critical problem areas such as taxation, transfer pricing, financial planning, and information systems within an international framework. Prerequisites for Accounting: ACCT 600 and completion of all required accounting concentration courses or concurrent registration in final required concentration courses.

Prerequisites for International Business: ACCT 600 and completion of all core courses or concurrent registration in final required core courses.

*3 semester credits*

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## Acupuncture

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### Acupuncture Practice and Techniques (APT)

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ACUPUNCTURE PRACTICE AND TECHNIQUES 511

#### Point Location I

This course will serve as the foundation of the acupuncture point selection series. Meridian theory using concepts of the Jing Luo system, including main and secondary vessels will be reinforced. This course provides the student with the knowledge and skills to physically locate acupuncture points of the lung, large intestine, stomach and spleen, heart and small intestine, urinary bladder, kidney, and pericardium channels. Students will focus on how to locate points effectively, accurately, and quickly as preparation for

clinical application as well as college and national examinations. Students will also learn the major function(s) and indications(s) of the Lung, Large Intestine, Stomach, Spleen, Heart, Small Intestine, Urinary Bladder, Kidney and Pericardium channel points. Co-requisite/Prerequisite: ATD 513 Oriental Diagnosis 1, ABS 511 Anatomy 1.

*1.5 lecture hours, 1 laboratory hour, 2 semester credits.*

ACUPUNCTURE PRACTICE AND TECHNIQUES 523

#### Point Location II

This is a continuation of the previous course and will focus on the Triple Warmer, Gall Bladder, Liver, Governing Vessel ("Du"), Conception Vessel ("Ren") and extra points. Additional instruction is given in regional point selection and point combinations. Prerequisites: ATD 513 Oriental Diagnosis 1, ABS 511 Anatomy 1.

*1.5 lecture hours, 1 laboratory hour, 2 semester credits*

ACUPUNCTURE PRACTICE AND TECHNIQUES 512

#### Meridian Theory

Meridian (a.k.a. Channel) theory is the basis of diagnosis and acupuncture treatment. This course is designed to provide the necessary instruction and training for the student to be familiar with meridian theory including regular, extra and other meridian systems. Co-requisite/Prerequisites: ATD 512 Oriental Theory and ATD 513 Oriental Diagnosis 1.

*2 lecture hours, 2 semester credits*

WESTERN BIOMEDICINE 521

#### Clean Needle Technique

This course prepares the student for emergency situations both in and out of the office. CCAOM Clean Needle Technique and a review of Occupational Safety and Health Administration (OSHA) standards are presented. In addition the student will practice safe and proper needling. All opathic treatments along with natural remedies for common complications of acupuncture and related therapies are discussed. course prepares the student for emergency situations commonly found in an acupuncture office. CPR certification in emergency procedures is achieved. Prerequisite: none.

*2 lecture hours, 2 semester credits.*

ACUPUNCTURE PRACTICE AND TECHNIQUES 614

#### Acupuncture Techniques I

This course covers the basic principles of acupuncture treatment for diseases involved

with different pathogenic factors, tissues and organs. Special point selection based on Root-Branch, Origin-End, Path of Qi, Five Element and Eight Parameter diagnoses are covered. Indications and contraindications of moxibustion, scalp acupuncture and electrical acupuncture stimulation are covered. Prerequisites: APT 51 1 and APT 523: Point location I and II.

*2 lecture hours, 2 laboratory hours, 3 semester credits*

ACUPUNCTURE PRACTICE AND TECHNIQUES 625

#### Acupuncture Techniques II

This course covers functions, indications and needling methods of the Well, Spring, Stream, River, Sea, Source, Luo, Xicleft, Back Shu, Front Mu and Lower He-sea, Eight Influential, Eight Confluent and important crossing points. Continuing practice in needling, moxibustion and cupping techniques is included. In addition, the prevention and treatment of acupuncture complications is covered. Prerequisite: APT 614 Techniques I.

*2 lecture hours, 2 laboratory hours, 3 semester credits*

ACUPUNCTURE PRACTICE AND TECHNIQUES 626

#### Auricular & Scalp Acupuncture

This course introduces the student to various forms of microsystem acupuncture, focusing on auricular and scalp systems. The student learns the respective maps of the scalp and ear, clinical applications and treatment strategies. Co-requisite/Prerequisite: APT 614 Acupuncture Techniques I.

*1 lecture hour, 1 semester credit*

ACUPUNCTURE PRACTICE AND TECHNIQUES 618

#### Pediatric Acupuncture

The special diagnostic and treatment skills required for the treatment of patients less than 12 years of age are discussed. The balance of safety for the patient and treatment efficacy is emphasized. Prerequisite: APT 625 Acupuncture Techniques II.

*1 lecture hour, 1 semester credit.*

ACUPUNCTURE PRACTICE AND TECHNIQUES 637

#### Japanese Acupuncture Techniques

This course covers the unique treatment strategies and protocols developed by Japanese acupuncture masters. Prerequisite: APT 614 Acupuncture Techniques I.

*1 lecture hour, 1 semester credit*

# Acupuncture

## *Oriental Theory, Diagnosis and Application (ATD)*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 511

### **Oriental History and Philosophy**

The student studies the different eras of Chinese history and the effects on Oriental Medicine theories. This course includes the study of the development of Naturalism, Philosophical and Religious Taoism, Confucianism, and Buddhism and their contributions to Chinese Medicine. For each philosophy, the course examines how the philosophy views the human relationship to nature, and the human relationship to the universe. In addition, the impact of philosophy and religion on the oriental medical paradigm is explored. Prerequisite: none.

*1 lecture hour, 0 Laboratory hours, 1 semester credit*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 512

### **Oriental Medical Theory**

This course includes the classic theories of yin and yang and the Five phases that are fundamental to understanding the Oriental medical relationship between humans and the universe. Normal physiology is studied through the fundamental substances (Qi, Blood, Essence, Spirit and bodily fluids), and organs. The basic theory of illness and diagnosis using four examinations (sight, listening and smelling, palpation, and asking) and Eight Parameters are covered. Co-requisites/ Prerequisites: Anatomy 1 and Physiology 1.

*2 lecture hours, 2 semester credits*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 513

### **Oriental Diagnosis I**

The basic theory and characteristics of the pathogenesis and pathogenic factors are covered including the seven emotions, disharmony of Yin and Yang, abnormalities in Qi, Blood, Spirit, Essence and Bodily fluids, and organ disharmonies are covered. Techniques in inquiry, palpation, tongue and pulse diagnosis are covered. Diagnoses incorporating the eight parameters as well as root and stem concepts are covered for each of the twelve zang-fu. Prerequisite/co- requisite: ADT 512 Oriental Medical Theory.

*2 lecture hours, 2 semester credits*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 524

### **Oriental Diagnosis II**

This course will provide the student with fur-

ther understanding of Oriental Medicine diagnosis, expanding on concepts from Oriental Diagnosis I. Traditional Chinese Medicine organ diagnoses, eight principle and febrile disease diagnoses will be stressed. In addition, treatment principles and acupuncture treatments based on these diagnostic systems will be explored. Differential diagnoses of common disease entities will be explored. Differential diagnoses of common disease entities will be explored. Students will also continue to practice pulse and tongue diagnosis. Prerequisite: ADT 513 Oriental Diagnosis I.

*2 lecture hours, 2 semester credits*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 515

### **First Year Seminar 1**

This course will help the student to negotiate their first year in the Acupuncture program. The student will be guided through overviews of Chinese Medicine as preparation for integrating material from the entire curriculum. The student will be introduced to Chinese Medical terminology as well as the range of resources and the different perspectives on this terminology and the concepts contained therein. In addition the student will be introduced to concepts of information literacy and its use in research methodology. Prerequisites: none.

*1.5 lecture hours, 1.5 semester credits*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 529

### **First Year Seminar 2**

This course will be a continuation of the first year seminar one. The student will be guided through the application and integration of concepts and skills acquired in the first semester curriculum. The student will begin applying these through the use of case studies and clinical examples. The basics of applying diagnosis and generation of treatment principles will be reinforced in a collegial setting. Group activities such as case analysis and grand rounds will also be introduced. Prerequisites: ATD 518.

*1.5 lecture hours, 1.5 semester credits*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 617

### **Second Year Seminar 1**

This course will help the student understand case study and to begin learning the skills necessary to become an AOM clinical practitioner. The student will be guided through case study and case analysis as utilized in

clinical practice as preparation for integrating material from the entire curriculum into the clinical setting. Case presentations and clinical skills are emphasized through a problem based learning format using TCM principles as the foundation. In addition, the student will gain a basic understanding of the ethical and legal issues surrounding licensed practice in the field of acupuncture. Prerequisites: ATD 529.

*1.5 lecture hours, 1.5 semester credits*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 618

### **Second Year Seminar 2**

This course will be a continuation of the second year seminar one. The student will be guided through the application of case analysis, integrative patient care, diagnostic, assessment and treatment application skills acquired in clinical observation and the first year's curriculum. The student will begin applying these through analyzing clinical cases. Advanced applications in 8-parameter, 5-element, zang-fu, wen bing and shan han lun diagnosis and treatment principles will be reinforced in a collegial setting using interdisciplinary case analysis and grand rounds. Prerequisites: ATD 617.

*1.5 lecture hours, 1.5 semester credits*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 711

### **East-West Pathology**

This course compares and contrasts diagnosis and treatment between Western and Oriental diagnoses. Western medical diagnosis of these diseases is incorporated so that the student is able to collaborate with western physicians. Major and common categories of diseases including respiratory tract, infectious, gastrointestinal, genitourinary and musculoskeletal diseases are covered. Prerequisite: ADT 513 Oriental Diagnosis I.

*2 lecture hours, 2 semester credits*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 715

### **Oriental Internal Medicine**

This course focuses on the diagnosis and oriental treatment of major illness. Treatment planning includes acupuncture, qi gong, and massage. Diagnoses cover respiratory illnesses, gastrointestinal, genitourinary, gynecological, and psychological illnesses. Root-stem and 5 Element treatments are included. Prerequisite: ADT 513 Oriental Diagnosis I.

*2 lecture hours, 2 semester credits.*

# Acupuncture

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 717

## Advanced Tongue and Pulse Diagnosis

This course is designed to increase the diagnostic skills and clinical applications of these uniquely oriental diagnostic parameters. The student studies healthy and diseased tongues and pulses and discusses how findings in these areas change the treatment principles and strategies. Case studies from the clinical internship are used to increase both depth and breadth of skill. Prerequisite: ADT 524: Oriental Diagnosis II.

*1 lecture hour, 1 semester credit*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 728

## Case Study Organization and Applications

Students learn to transition from the development of pattern diagnosis to TCM treatment principles which then lead to point and modality applications. Emphasis is placed on an accurate assignment of symptoms to pattern diagnosis; logical treatment principles reflecting the priorities and totality of the patterns diagnosis; and the most efficacious acupuncture point and adjunctive modality prescriptions to help the patient achieve health. Prerequisite: ADT 524: Oriental Diagnosis II.

*1 lecture hour, 1 semester credit.*

ORIENTAL THEORY, DIAGNOSIS AND APPLICATION 729

## Oriental Gynecology

This course is designed to familiarize the student with oriental diagnosis and acupuncture treatments of common gynecologic conditions. Special emphasis is placed on understanding those points forbidden to needle or moxa in cases where the patient's pregnancy status is unknown. Prerequisite: ATD 524: Oriental Diagnosis II.

*1 lecture hour, 1 semester credit*

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## Western Biomedicine (AWB)

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BASIC SCIENCE 511

## Anatomy 1

This course provides an in-depth study of the macroscopic human anatomy and covers the structure of the trunk and neck regions. Clinical aspects of the vascular and neurological relationships of these regions are emphasized. Instruction includes lectures and interactive media software. Prerequisite: none.

*4 lecture hours, 4 semester credits*

BASIC SCIENCES 522

## Anatomy 2

This course is a continuation of Anatomy 1 and covers the structure of the head and extremities. Clinical aspects of the neurological and vascular relationships of the regions of the body are emphasized. Prerequisite: ABS 511 Anatomy 1.

*4 lecture hours, 4 semester credits*

BASIC SCIENCES 515

## Physiology 1

This course emphasizes the function of cellular structures which regulate homeostasis as well as their role in cell division and genetic control of protein synthesis. Emphasis is placed on the role of the cell membrane in the control of cellular events. The effects of physiology on hormones, their role in homeostasis, and the functional changes associated with homeostasis are considered. Prerequisite: none.

*2 lecture hours, 2 semester credits*

BASIC SCIENCES 525

## Physiology 2

This course is a study of physiology at the organ and systems level. Included is the study of the circulatory, respiratory, renal, cardiovascular, gastrointestinal and urogenital systems. Also included is the study of the endocrine system and its interrelationships with various organs and systems. There is an integration of normal physiology with pathophysiology and clinical concepts. Prerequisite: ABS 515.

*2 lecture hours, 2 semester credits*

WESTERN BIOMEDICINE 523

## Pharmacology

This course examines the most commonly used pharmacologic agents to be encountered in the clinical setting. The general principles of pharmacology (pharmacodynamics and pharmacokinetics) are covered. Uses and side effects of antibiotics, anti-inflammatory agents, hormones and cardiac drugs are surveyed. Drug- nutrient and drug-herb interactions are discussed. Prerequisite: none.

*1 lecture hour, 1 semester credit*

CLINICAL SCIENCES 611

## Pathology 1

This course is a study of the pathophysiological process and how this process alters the gross, microscopic and clinical manifestations of disease. Basic pathological processes of inflammation, repair, degeneration, necrosis,

immunology and neoplasia are presented. Prerequisite: ABS 525 Physiology 2.

*2 lecture hours, 2 semester credits*

CLINICAL SCIENCES 624

## Pathology 2

This course is the continuation of the pathological processes of various diseases. This course emphasizes the basis of systemic diseases of the cardiovascular, respiratory, gastrointestinal, urogenital, endocrine, hepatobiliary, renal and pancreatic systems. Prerequisite: ACS 611 Pathology 1.

*4 lecture hours, 4 semester credits*

CLINICAL SCIENCES 612

## Clinical Diagnosis 1

This course covers the techniques used for physical examination for various systems of the body. Skills taught develop an appreciation for normal variations and abnormalities associated with disease states. The student is taught to recognize the signs and symptoms of common diseases. Prerequisites: ABS 511, ABS 521, ABS 515, ABS 252.

*3 Lecture hours, 2 lab hours, 4 semester credits*

CLINICAL SCIENCES 623

## Clinical Diagnosis 2

This course is a continuation of Clinical Diagnosis 1. Prerequisite: ACS 612.

*3 lecture hours, 2 lab hours, 4 semester credits*

CLINICAL SCIENCES 724

## Public Health

This course covers current environmental and public health concerns and issues. The course integrates health with diet, water and air pollutants, noise and substance abuse. Recognition of major communicable diseases is included. Prerequisite: ABS 525 Pathology 2.

*2 lecture hours, 2 semester credits*

CLINICAL SCIENCES 613

## Lab Diagnosis

This course introduces the student to the appropriate use and interpretation of laboratory tests. Prerequisites: ABS 521 and ABS 525.

*2 lecture hours, 2 semester credits*

ANT 521

## Nutrition

This course provides the foundation for therapeutic nutrition. It explores the biochemistry of macronutrients as well as vitamins and minerals. Deficiencies, toxicities, therapeutic

# Acupuncture

uses and appropriate doses are examined. An assessment of dietary needs and the application of therapeutic nutrition in treating individual diseases and syndromes are also taught. Prerequisites: none.

*2 lecture hours, 2 semester credits*

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## Herbal Medicine Survey (AHM)

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BOTANICAL MEDICINE 521

### Botanical Medicine

This course comprises a survey of plant and plant preparations most commonly used in Western traditions. The actions of the plant and plant products, as well as drug-herb interactions are considered. Prerequisites: ABS 515, Co-requisite: ACS 611.

*2 lecture hours, 2 semester credits*

HERBAL MEDICINE SURVEY 612

### Introduction to Chinese Herbal Remedies

This survey course introduces the student to the diagnostic and treatment strategies specific to oriental herbal therapies. The student is introduced to major herbs and formulas of China, their uses, contraindications and drug-herb interaction. Patient safety issues are also addressed. Prerequisite: ATD 513 Oriental Diagnosis 1.

*1 lecture hour, 1 semester credit*

HERBAL MEDICINE SURVEY 713

### Patent Remedies

This course will survey the major over-the-counter remedies used in China. Safety issues, use of animal products, endangered species, and the adulteration of common remedies is emphasized. Prerequisite: AHM 612: Introduction to Chinese Herbal Remedies.

*2 lecture hours, 2 semester credits*

HERBAL MEDICINE SURVEY 613

### Oriental Dietetics

This class introduces the student to the eastern understanding of how food influences human health. Foods and food products are surveyed according to Asian categorization. Food groups are categorized by nature, temperature, taste, element, indications and contraindications. Treatment of the major categories of organ (zang-fu) disorders using foods and food combinations are covered. Prerequisite: ADT 513 Oriental Diagnosis I.

*2 lecture hours, 2 semester credits*

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## Movement and Respiration Studies (AMR)

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MOVEMENT AND RESPIRATION STUDIES 511

### Taijiquan 1

This introductory course in therapeutic movement teaches the proper musculoskeletal alignment, breathing, and mental awareness affect the energy pathways by direct experience through practice of this traditional exercise. Prerequisite: none.

*0 lecture hours, 1.5 laboratory hours, 1 semester credit*

MOVEMENT AND RESPIRATION STUDIES 522

### Taijiquan 2

This is a continuation of Taijiquan 1. Prerequisite: AMR 511 Taijiquan 1.

*0 lecture hours, 1.5 laboratory hours, 1 semester credit*

MOVEMENT AND RESPIRATION STUDIES 613

### Qigong 1

This course teaches a variety of therapeutic exercises designed to increase the student's awareness of anatomy and energy pathways as well as how to choose and teach appropriate exercises in a clinic setting. Prerequisite: AMR 522: Taijiquan 2

*0 lecture hours, 1.5 laboratory hours, 1 semester credit*

MOVEMENT AND RESPIRATION STUDIES 624

### Qigong 2

This course is a continuation of Qigong 1, teaching exercises and detailing their clinical application. Prerequisite: AMR 613 Qigong 1.

*0 lecture hours, 1.5 laboratory hours, 1 semester credit*

MOVEMENT AND RESPIRATION STUDIES 627

### Palpation/Massage

In this course students integrate the knowledge of anatomy with the skills of palpation. Emphasis is placed on the muscular system. Basic soft tissue technique is taught as a way to understand muscular relationships. Students work to assess soft tissues and practice techniques. Prerequisite: ABS 522 Anatomy 2.

*1 lecture hour, 2 laboratory hours, 2 semester*

MOVEMENT AND RESPIRATION STUDIES 715

### Oriental Massage I

The student learns Tui Na soft tissue manipulation technique as well as its history, theory,

application, and indications. Treatment of childhood illness is the main focus. I don't have experience in pediatric methods. My emphasis (assuming I take on this course in the fall) would be on musculoskeletal complaints. In addition, therapeutic techniques for the shoulder, neck, abdomen, back pain and headaches are covered. Prerequisite: ATD 513 Oriental Diagnosis 1.

*1 lecture hour, 2 laboratory hours, 2 semester credits*

MOVEMENT AND RESPIRATION STUDIES 726

### Oriental Massage II

Shiatzu, deep tissue massage and other forms of Oriental massage are covered. Treatment plans for major musculoskeletal and gastrointestinal diagnoses are covered. Prerequisite: AMR 715 Oriental Massage 1.

*1 lecture hour, 2 laboratory hours, 2 semester credits*

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## Counseling, Communications and Practice management

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PSYCHOLOGICAL ASSESSMENT 621

### Psychological Assessment

The primary focus of this course is the diagnosis of the various psychiatric diseases according to the Diagnostic and Statistical Manual of Mental Disorders. Included are psychological assessment considerations and treatment modalities. Prerequisites: none.

*2 lecture hours, 2 semester credits*

APP 721

### Practice Management

Students are taught the current procedural practices for the operation of a private practice. In addition, the practical aspects of operating a practice as a small business are discussed. Students are encouraged to begin thinking about their personal career path as a complementary medicine practitioner in private practice, group practice, hospital-based practice or as an AOM educator. Prerequisites: none.

*2 lecture hours, 2 semester credits*

ATD 617 Second Year Seminar 1 & ATD 617 Second Year Seminar 2 (see section above "Oriental Theory, Diagnosis and Application")

# Acupuncture • Biomedical Engineering

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## Clinical Services (ACS)

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CLINICAL SERVICES 711

### Preceptorship I

The students observe and administer care in established acupuncture facilities under the supervision of licensed physicians and acupuncturists. This exposure to a variety of clinical settings helps prepare the student for both private practice and integrative patient care. Prerequisite: Completion of all first year courses.

*0 lecture hours, 4 laboratory hours, 2 semester credits, 75 hours total*

CLINICAL SERVICES 722

### Preceptorship II

This is a continuation of ACS 711. Students increase their clinical skills working under a variety of health care professionals, all of whom must have the appropriate credentials to practice in the field of acupuncture. Prerequisite: ACS 711.

*0 lecture hours, 4 laboratory hours, 2 semester credits, 75 hours total*

CLINICAL SERVICES 631

### Clinical Internship I

Under the supervision of licensed faculty members, the interns start by observing patients for 30 clinic hours, then move into the area of direct patient care. All patient diagnoses and management plans are reviewed and approved by a clinic faculty member prior to the initiation of patient care. The student will begin to practice clean needle technique, removal and disposal of needles. The student will acquire proficiency in tongue and pulse diagnosis. Prerequisite: Pass Clinical Entrance Exam.

*0 lecture hours, 12 laboratory hours, 8 semester credits, 245 total hours*

CLINICAL SERVICES 712

### Clinical Internship II

Students continue to administer care to patients under the supervision of licensed faculty. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program. Eligibility for the internship is successful completion of the previous clinical internship. Prerequisite: ACS 631 Clinical Internship I.

*0 lecture hours, 12 laboratory hours, 8 semester credits, 215 total hours*

CLINICAL SERVICES 723

### Clinical Internship III

Students continue to administer care to patients under the supervision of licensed faculty. Students are monitored as to their progress toward completing the qualitative and quantitative requirements necessary for the successful completion of the program. Eligibility for the internship is successful completion of the previous clinical internship. Prerequisite: ACS 631 Clinical Internship I.

*0 lecture hours, 12 laboratory hours, 8 semester credits, 220 total hours*

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## Biomedical Engineering

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BIOMEDICAL ENGINEERING 410 (BMEG 410/ELEG 410)

### Biosensors

This course will provide an overview of biosensors, including their use in pharmaceutical research, diagnostic testing, and policing the environment. Topics include the fabrication, characterization, testing, and simulation. The transducer phenomenology, biosensor structure, and sensor performance will also be covered.

*3 semester credits*

BIOMEDICAL ENGINEERING 412 (BMEG 412/ELEG 412)

### Bioelectronics

Discipline of biomedical Engineering has emerged due to integration of engineering principles and technology into medicine. This course is intended for engineers and engineering students interested in perusing career in biomedical engineering and health related field. This course will first introduce principles to biology, medicine, behavior, or health will be identified during first half of the semester. Second half of the course will focus on research, design, development and application of biosensors and Bioelectronics.

*3 semester credits*

BIOMEDICAL ENGINEERING 415 (BMEG 415/ELEG 415)

### Bioinformatics

Biology has become target of more algorithms than any other fundamental science. This course is about designing and developing algorithms for biological problems. Students will work with popular bioinformatics algorithms not only to understand algorithms design mythologies but also to identify

strengths and potential weaknesses in traditional bioinformatics algorithms.

*3 semester credits*

BIOMEDICAL ENGINEERING 440 (BMEG 440/MEEG 440)

### Ergonomic Factors in Design

This course introduces the student to the concepts of ergonomics. Ergonomics is the study of fitting the workplace and devices to the capabilities of the human worker. Students will have an understanding of the beginning and evolution of the field of ergonomics. They will learn to recognize risk factors associated with repetitive stress disorders (e.g., carpal tunnel syndrome) and potential sprain/strain injuries as well as be familiar with the body areas affected. This course covers principles of physiology and biomechanics and how they apply to workstation and tool design.

*3 semester credits*

BIOMEDICAL ENGINEERING 443 (BMEG 443/ELEG 443)

### Digital Signal Processing

This is an introductory course in Digital Signal Processing (DSP) for graduate Electrical and Computer Engineering students. Some time will be spent initially reviewing major concepts in signals and systems. Major topics to be covered in ELEG 443 include: time-domain analysis of discrete-time (DT) systems (convolution, difference equations), the transform, frequency analysis for DT signals and systems (DTFT, DFT, FFT), digital filter design, and selected advanced topics as time permits.

*3 semester credits*

BIOMEDICAL ENGINEERING 446 (BMEG 446/ELEG 446)

### Introduction to MEMS

MEMS (Micro Electro Mechanical Systems) refers to devices and system with very small size in the range of microns. It is one of the most important high technologies developed in 20th century. This course covers the fundamentals of MEMS. It includes the introduction to MEMS, basic microfabrication techniques, MEMS materials and their properties, MEMS device design and simulation, working principle analysis, MEMS device fabrication sequence, MEMS packaging and assembly, signal testing, MEMS applications (inertial MEMS, MOEMS, BioMEMS, RFMEMS, etc.).

*3 semester credits*

# Biomedical Engineering

BIOMEDICAL ENGINEERING 451

## **Introduction to BioMEMS**

This course will introduce to students the fundamentals of BioMEMS, the application of MEMS (Microelectromechanical Systems) for biological applications. The topics include microfabrication, microfluidics, biosensors, actuators, micro/nan drug delivery systems, micro total analysis systems and lab-on-a-chip devices, and detection and measurement systems. The main focus is to understand the fundamental challenges and limitations involved in designing and fabricating various BioMEMS and BioNEMS devices.

*3 semester credits*

BIOMEDICAL ENGINEERING 506 (BMEG 506/MEEG 506)

## **Transport Phenomena in Biological Systems**

This course provides understanding of the physical, chemical and biological processes governing the movement of mass and transmission of forces throughout an organism, which are important to biomedical engineers in the design and operation of biomedical devices. Engineering fundamentals of transport phenomena (fluid flow, heat transfer, and mass transfer) will be discussed in biological applications. Mathematical modeling will be used to analyze the biological transport and biochemical interactions in physiological systems, such as cardiovascular and respiratory systems. Numerical modeling will also be introduced to simulate some biological processes to enhance mathematical understanding.

*3 semester credits*

BIOMEDICAL ENGINEERING 507

## **Algorithms in Bioinformatics**

This course is tailored for students both in biomedical engineering department and computer science and engineering department desiring to understand the issues concerning representing and analyzing genomes, sequence of proteins etc. The course is about applying the techniques (computational methods and systems) developed in computer science to solve problems in molecular biology such as DNA or protein sequences alignment problem, genome rearrangement problem, protein folding problems and so on. Hidden Markov Models (HMM), Bayesian Model, clustering, decision trees are some of the examples of machine learning methods that will be covered in the course.

*3 semester credits*

BIOMEDICAL ENGINEERING 508 (BMEG 508/MEEG 508)

## **Biomechanics**

Biomechanics is the application of mechanical principles to living organisms that included bioengineering, research and analysis of mechanism in living organisms, and application of engineering principles to and from biological systems. This course can be carried forth on from the molecular level including collagen and elastin, all the way up to the tissue and organ level. Some simple applications of Newtonian mechanics can supply approximations on each level, but precise details demand the use of continuum mechanics.

*3 semester credits*

BIOMEDICAL ENGINEERING 510 (BMEG 510/ELEG 510)

## **Medical Machines**

This course, provides very good introduction and understanding of Electrical Safety, Medical electronics and Medical Machines as applicable. Students often have different background and level of understanding of technical concepts; therefore we will develop necessary background in this course in first few weeks and gradually move from basic to advance topics as listed below in "Class Topics" section. This course will further help by developing approach to design devices and safety features. Behind every invention, law or device, there is always a need, a necessity. Students go from necessity to invention in the class. Since large number of electronic equipments are being used in hospitals and medical centers for patient care and diagnosis or carry out advanced surgeries. This course will enable students to learn the basics principles of different instruments used in medical science.

*3 semester credits*

BIOMEDICAL ENGINEERING 511 (BMEG 511/MEEG 511)

## **Designs and Development of Biomedical Instrument**

This course offers the information to understand and design biomedical instruments. Biomedical instruments contains imaging and monitoring the environment, simulation and modeling, instrument testing, biosensors and diagnostics, instrument design and development, therapeutic devices, next generation instrument technology, clinical and regulatory, and etc. The in-depth descriptions of design methods for biomedical instrument will be included in the course

*3 semester credits*

BIOMEDICAL ENGINEERING 513 (BMEG 513/ELEG 513)

## **Biomedical Image Processing**

This course is an elective course. The content of this course include the fundamentals of Digital Image Processing and its applications in biomedical field. Sampling and Quantization of signals are mentioned in order to introduce the digital images, some basic relationship between pixels are mentioned. Introduction to Fourier Transformation, Discrete Fourier Transform and Fast Fourier Transformed are explained. MATLAB programming with Image Processing Toolbox will be introduced to empathize and rigid the understanding of students. Others important fundamental theorems, e.g., Image Enhancement, Image Segmentation, Representation and Description are also mentioned. Students are required to implement some programs using the theorems learnt in classes.

*3 semester credits*

BIOMEDICAL ENGINEERING 520 (BMEG 520/BIOL 520)

## **Physiology**

The physiological and biochemical principles that control the function of the human body will be covered. Laboratory work will introduce the student to basic physiologic experimentation, interpretation and presentation of results.

*3 semester credits*

BIOMEDICAL ENGINEERING 530

## **Instrumentation and Laboratory Experience**

This course can be taken in any semester. Working with the program director, engineering or life science, the students will get permission to enter the relevant lab and formulate an experimental plan with the faculty supervisor of that lab. At the end of the lab experience the student will present their lab notebook for inspection to the lab supervisors and the program director.

*3 semester credits*

BIOMEDICAL ENGINEERING 535 (BMEG 535/TCMG 535)

## **Foundations of Biotech Sciences and Management**

This course defines biotechnology as the application of molecular biology for useful purposes. It simulates the real world science and business environments: Information and knowledge are complex, highly specific, fragmented, diverse and vast. No one individual or group or business entity or government agency is able to cover in-depth the

# Biomedical Engineering

entire science and business continuum to succeed and create value to society at large. Value creation has three different aspects: data, information and knowledge assimilation, degree of collaboration and methodology to establish successful knowledge management and business processes. The continuum of the biotechnology industry is shaped by scientific, legal, regulatory, social, economic, technological, political, financial and commercial factors. Understanding the dynamics and linked contributions of the interdisciplinary array of factors which affect commercialization of bioscience discoveries is essential to operate in the biotechnology industry. In this course we are dissecting the biotechnology industry to isolate the key drivers and study their interactions.

*3 semester credits*

BIOMEDICAL ENGINEERING 540 (BMEG 540/BIOL 540)

## **Advanced Cell and Molecular Biology**

The general biological principles that govern all living organisms will be discussed. The structure and function of cells with emphasis on gene activity at the molecular level, DNA replication and repair, transcription, translation, recombination, translocation and mutations. Techniques and experiments leading to important discoveries on DNA will be covered.

*3 semester credits*

BIOMEDICAL ENGINEERING 541 (BMEG 541/TCMG 541)

## **Foundations of Biotechnology and Bioentrepreneurship**

In this course we are dissecting the biotechnology industry to isolate the key drivers and study their interactions. Discoveries in science and fast developments in technology combined with financial availabilities offer many entrepreneurial opportunities.

*3 semester credits*

BIOMEDICAL ENGINEERING 546 (BMEG 546/ELEG 546)

## **Biosignal Processing**

This is an introductory course in Bio-Signal Processing (DSP) for graduate Electrical and Computer Engineering students. Sometime will be spent initially reviewing major concepts in signals and systems. Major topics to be covered in ELEG 546 include: Concepts of signal and image processing, wavelets, classification and clustering, and applications of these concepts to EEG, ECG, EMG, MRI and CT Scans.

*3 semester credits*

BIOMEDICAL ENGINEERING 560 (BMEG 560/MEEG 560)

## **Advanced Tissue Engineering**

This course deals with specific elements of tissue engineering design and analysis. Approaches to the regeneration of three tissue systems will be analyzed utilizing engineering design. Concepts ranging from tissue development and dynamic growth conditions to ultimate tissue properties will be addressed. Students will be required to acquire understanding and expertise from analysis of primary literature and will complete group presentations on directed approaches to tissue design and engineering in three tissue systems. To ensure in-depth understanding of different aspects of tissue engineering the groups will be required to focus on one or two key aspects in each mini design module.

*3 semester credits*

BIOMEDICAL ENGINEERING 561 (BMEG 561/ELEG 561)

## **Fundamental Analysis of Nanomaterials**

The course will give an overview on several important analytical tools for nano materials characterization. Mechanical, electrical and electronic and biological property testing of the nano materials such as carbon nanotubes, metal nanoparticles, quantum dots, nanowires conformable nanoelectronics materials, polymer nanoparticles and biomedical nanomaterials will be discussed. Process and product evaluation by physical, chemical and microscopic methods for materials in nano-regime will be highlighted. Modern materials science depends on the use of a battery of analytical methods carried normally in specialized laboratories. This course explains the fundamental principles associated with the various methods and familiarize the students with them, their range of applicability and reliability especially when materials are of nanoscopic dimension.

*3 semester credits*

BIOMEDICAL ENGINEERING 562 (BMEG 562/ELEG 562)

## **Nanofabrication with Soft Materials**

This is an advanced level graduate course focusing on fabrication of soft materials. Nanofabrication processes and nanosystem products will be discussed. Fundamentals associated with chips fabrications and linking them toward soft materials assembly will be detailed. Emerging nanotechnology based methods for soft and green electronics, mechanical parts, MEMS, PCBS will be covered.

Gene chip, label free sensory assay using micro and nanofluidics will be discussed. Transfer printing, DNA-protein interactions using the chip and several nano-scale assemblies for soft materials fabrication will be discussed.

*3 semester credits*

BIOMEDICAL ENGINEERING 565 (BMEG 565/ELEG 565)

## **Biomedical Materials and Engineering**

This course introduces the students with the progress of biomaterials used in biomedical engineering. Starting from early civilizations biomaterials this course discusses modern advanced level biomaterials and their engineering principles associated with their biomedical use. Hip, knee Prostheses, implants, grafts, sutures, stents, catheters materials and their application in Biomedical Engineering are covered. Designed biomaterials such as silicones, polyurethane, Teflon, hydrogels, bionanocomposites are detailed. Modern Biology and biomedical engineering such as protein absorption, biospecific medical materials, nonfouling materials, healing and foreign body reaction, controlled release etc are discussed. Surface-immobilized biomolecules in patterned surfaces are explained with specific examples of the use of immobilized biomolecules, immobilized cell ligands, and immobilization methods. Recent advances in biomedical engineering from the perspectives of inkjet printing of cells and tissues for 3D-medical textiles, nanofibers and films in biomedical engineering by electrostatic spinning, bio-inspired materials through layer by layer (LBL) assembly and biogels and advanced instrumentations in biomedical engineering are updated. Artificial red blood and skin substitutes, orthopedic biomaterials applications adhesives and sealants, diagnostics, biomedical sensors, extracorporeal artificial organs and ethical issues of biomedical engineering are discussed.

*3 semester credits*

BIOMEDICAL ENGINEERING 569 (BMEG 569/MEEG 569)

## **Advanced Biomedical Materials and Engineering**

This course will cover the advanced level understanding on the different types of biomaterials using in medical purposes and their design. Modern biology in biomedical engineering such as but not limited to protein absorption, immuno isolation, regenerative medicine etc will be covered. Ethical issues in biomedical engineering will be discussed.

## Biomedical Engineering • Business Capstone

Cutting edge research on nanobiotechnology that extends to biosensors, 3D biomatrix, advanced diagnostic, dental composites, sealants, adhesives will be covered. Device fabrication aspect of biomedical engineering especially that are at the interface of nanotechnology and biomaterials will be thoroughly discussed.

*3 semester credits*

BIOMEDICAL ENGINEERING 571 (BMEG 571/MEEG 571)

### **Ethical Issues in Biomedical Research**

This course will be offered as a one hour discussion with a group of students in the instructor's office keeping in mind the ethical issues dealing with Biomedical Engineering. Health concerns on handling nanobiomaterials, laws and bylaws associated with human subjects and the Food and Drug Administration's requirements will be discussed. Hence creating an ethical awareness associated with Biomedical Engineering.

*3 semester credits*

BIOMEDICAL ENGINEERING 580

### **Tissue Engineering**

The objective of this course is to provide students a foundation for the understanding of cell based systems needed for tissue engineering. The structure-property-function relationships in normal and pathological mammalian tissues will be covered. A review of the current development of biological substitutes to restore, maintain, or improve functions that includes strategies to regenerate metabolic organs and repair structural tissues, as well as cell-based therapies to deliver proteins and other therapeutic drugs will be discussed. There are a variety of very important materials issues in tissue engineering, which will be discussed in detail. Cells adherence to the extracellular matrix materials in the body and their enormous effect on cell behavior will be detailed. The physical and chemical properties of these materials will be examined and important materials used in tissue engineering will be discussed.

*3 semester credits*

BIOMEDICAL ENGINEERING 620

### **Team Based Research Project**

This course must be taken in your last semester of course work or later. This is a team based project. Teams with members from both the life sciences and the quantitative

sciences are strongly encouraged. You may have more than one advisor, but one faculty member needs to be identified as the primary advisor. Your capstone project may be based on a single project or multiple projects. Each project, however, must be experimental or simulation in nature and be interdisciplinary. The project results should be publishable in peer reviewed journals. All projects must be approved by the University's BME program committee prior to student enrollment in the BME 620 course.

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## **Business Capstone**

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BUSINESS CAPSTONE 797

### **Integration and Application: Strategy**

This is a capstone course dealing with the development and implementation of business strategy and planning within a framework of ethical decision-making, globalization and managing accelerating change. The student is tested on his/her capability to apply all prior learning to solve actual strategic management problems. The final project of this course is project-based, and shall constitute an outcome assessment of what the student has learned in the MBA program. This project, normally an extensive and comprehensive case study, will be graded by several faculty members representing different and relevant disciplines. Prerequisites: Completion of all core and required courses and completion of all Major courses or concurrent registration with final Major courses. Normally, students enroll toward the end of their MBA program.

*3 semester credits*

BUSINESS CAPSTONE 781

### **Integration and Application: Business Simulation and Planning**

Each student-executive will assess changing industry and competitive conditions, evaluate the strategies of competitors, carefully craft ways to secure a competitive advantage to increase their case company's market shares by correctly forecasting industry-wide demands for individual market segments, and plan in advance for production capacity expansions to take advantage of growing market demands. The student has the opportunity to make decisions testing his or

her ability to apply logic, insight, judgment and common sense and evaluate the resulting impact on profits, stockholder equity, customers or clients and investors.

*3 semester credits*

Prerequisites: Completion of all core and required courses and completion of all Major courses or concurrent registration with final Major courses. Normally, students enroll toward the end of their MBA program.

BUSINESS CAPSTONE 799

### **Integration and Application: Internship**

This course should be taken towards the end of the student's program of study and requires the approval of the student's faculty advisor.

*3 semester credits, 1 semester credit, 1 semester credit*

BUSINESS CAPSTONE 798

### **Integration and Application: Thesis**

Students will complete a report based on field, library and institutional research to demonstrate ability to conduct investigations in a managerial discipline. The topic of the report may concern any business issue, industry or organization and may be related to the student's current or future employment. Prerequisites: Completion of all Major courses or concurrent registration with final Major courses. This course should be taken in the final semester of a student's MBA program and approval of the student's faculty advisor is required.

*3 semester credits*

BUSINESS CAPSTONE 795

### **Independent Study**

This course is reserved for a special project that cannot be done in any other course format and is intended to allow a student complete his/her MBA requirements. Students will study a topic approved by their professor and present a substantial written report regarding the topic. Prerequisite: Completion of core courses and required Major courses. Written approval to register by the supervising professor and the Assistant Dean are required. This course is normally taken towards the end of the student's MBA program.

*3 semester credits*

# Business Communications • Business Law • Chiropractic

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## Business Communications

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BUSINESS COMMUNICATIONS 603

### Business Written Communications

The purpose of this course is to improve the ability of students to effectively communicate with a variety of writing techniques. Students will not only learn and practice grammatical principles, but also learn to present tables and graphs, and to organize and coherently structure their written reports. Prerequisites: Admission to graduate study.

*3 semester credits*

BUSINESS COMMUNICATIONS 605

### Business Oral Communications

The purpose of this course is to improve the ability of students to effectively communicate with a variety of oral presentation techniques. Students will not only learn and practice speech principles, but also learn to visually present tables and graphs, and to organize and coherently structure their oral communications. Prerequisites: Admission to graduate study.

*3 semester credits*

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## Business Law

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BUSINESS LAW 600

### Legal Environment of Business and Ethics

Students course focuses on how the legal environment of business impacts business decisions with broad ethical, international, and critical thinking examples throughout. Knowledge of the legal aspects of running a business will enable the student to conduct business within the legal framework and understand the ethical dimension of business decisions. Topics include: Introduction to Business Ethics and the Judicial and Legislative Process; Litigation, Alternative Dispute Resolution, and the Administrative Process; Business Crimes, Torts, and Contracts; the Constitution and Government Regulation of Business; Business Organizations; Employment and Labor Laws; Consumer Protection and Environmental Regulation; and International Law and Ethical Conflicts. Prerequisites: Admission to graduate study.

*3 semester credits*

BUSINESS LAW 645

### Employment and Labor Law

Students study the current employment and labor law in the U.S. and the historical development of these laws from common law to existing law. The course covers a wide range of legal and regulatory topics needed for human resources management including workplace safety, family leave, equal employment and pay, wrongful discharge, privacy, harassment, and illegal workers. In addition, development of global laws and laws related to employment and labor in other countries are reviewed. Prerequisites: MGMT 600, BLAW 600 and completion of all core courses or concurrent registration in final core courses. Normally students take MGMT 611 before or concurrent with BLAW 645.

*3 semester credits*

BUSINESS LAW 720

### Business and Society: Intellectual Property and Anti-Trust Law

This course reviews the basic principles of U.S. intellectual property law (patents, copyrights, trade secrets, trademarks and the protection of ideas), with accompanying ethical issues; and explains how international treaties (e.g. Berne Convention) have affected global trade. The course reviews select anti-trust laws in the U.S., and it analyzes to what extent parties outside the U.S., doing business in or with the U.S., are subject to American anti-trust and intellectual property laws. Prerequisites: BLAW 600 and completion of all concentration required courses or concurrent registration in final required concentration courses. Permission of Assistant Dean is required.

*3 semester credits*

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## Chiropractic

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### Anatomy

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ANATOMY 511

### Cell and Tissue Microscopic Anatomy and Physiology

This course will focus on the study of the microscopic anatomy and physiology of cells and basic tissue types. A major emphasis will be placed on connective, neural, and muscular tissues. A working knowledge of the

microscopic structure and function of the basic tissue types will provide a framework for understanding how the organization of the tissues contribute to organ and organ system physiology.

*3 lecture hours, 3 semester hours*

ANATOMY 512

### Functional Anatomy and Biomechanics I: Spine

This course addresses the functional anatomy and biomechanics of the spinal column, ribs, and pelvis. Emphasis is placed on the interrelationships between the structure and function of the spinal column and its surrounding anatomical structures. Biomechanical principles are incorporated into functional anatomy of a dynamic human musculoskeletal system. Instruction includes lecture, dissection, tutorials, prosection and models.

*3 lecture hours, 3 laboratory hours, 4.5 semester hours*

ANATOMY 513

### General Anatomy I: Viscera

This courses focuses on the anatomy of the organs plus the walls of the human thoracic and abdominopelvic cavities. The neurological and vascular relationships of these organs are discussed with emphasis on the clinical applications. Instruction includes lectures and laboratory with dissection and prosection, osseous structures and models.

*3 lecture hours, 3 laboratory hours, 4.5 semester hours*

ANATOMY 514

### Clinical Embryology

Embryology covers the gametogenesis, fertilization, structural development from the zygote to birth. This course correlates the embryological development with other courses offered in semester I. Normal development, clinical correlations and common congenital abnormalities are presented. Emphasis is placed on the skeletal, muscular and nervous systems.

*1 lecture hour, 1 semester hour*

ANATOMY 525

### General Anatomy II: Head and Neck

This course focuses on the anatomy of the head, including the gross anatomy of the brain and special sense organs, and neck. The neurological and vascular relationships of these regions are discussed with emphasis on clinical applications. Instruction includes lectures, laboratory dissection and prosec-

# Chiropractic

tion, and models. Prerequisites: AN511, AN512, AN514.

*3 lecture hours, 3 laboratory hours, 4.5 semester hours*

ANATOMY 526

## **Functional Anatomy and Biomechanics II: Extremities**

This course is a regional exploration of the appendicular system. Bones, muscle attachment and function, vascular and innervation are discussed. Emphasis is on understanding functional based on-attachment and on innervation. Relevant clinical problems are presented. Instruction includes lectures, full dissection of the pectoral girdle, pelvic girdle and extremities, presentation of prosections, study of the bones and models. Biomechanics II, the study of joint mechanics of the appendicular system is a subset of this course that includes muscle, kinetics and gait analysis. Prerequisites: AN511, AN512, AN514.

*3 lecture hours, 3 laboratory hours, 4.5 semester hours*

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## *Biochemistry*

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BIOCHEMISTRY 511

### **Biochemistry, Metabolism, and Nutrition**

This course covers the biochemical principles involved in maintaining functional homeostasis.

*2 lecture hours, 2 semester hours*

BIOCHEMISTRY 612

### **Biochemistry II**

This course is a continuation of BC 511.

*2 lecture hours, 2 semester hours*

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## *Business Procedures*

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BUSINESS PROCEDURES 715

### **Ethics**

This is a risk management course that stresses the importance of ethical and legal business management procedures. Student learn risk management, jurisprudence, ethics, and the informed consent process. Successful completion will prepare the student to practice as an ethical health care provider.

*1 lecture hours, 1 semester hour*

BUSINESS PROCEDURES 721

### **Business Procedures: Billing and Coding**

The successful student will be able to identify and discuss all the important aspects of patient communication, medical documentation and insurance protocols/coding. In addition, the successful student will be able to identify and apply appropriate billing protocols regarding filing insurance claim forms.

*1 lecture hours, 1 semester hour*

BUSINESS PROCEDURES 722

### **Business Procedures and Marketing**

This is a business procedures course that stresses the importance of ethical and legal business management procedures. The classroom discussions cover strategic management, chiropractic and health care economics, marketing, and image building. Successful completion will prepare the student to enter chiropractic practice.

*1 semester hour*

BUSINESS PROCEDURES 813

### **Starting a Chiropractic Practice and Office Management**

At the completion of this course the student will have a clear understanding and knowledge of the three basic choices when starting a chiropractic practice. They will also recognize their options related to selecting a business structure as well as being able to identify the type of practice they want to establish. In addition, the student should be able to recognize the different types of health insurance and manage care plans typically encountered in a chiropractic office as well as the importance of obtaining access into these insurance networks. Finally, the student should recognize the importance of report of findings, HIPPA (Federal) guidelines and basic hospital protocols. Prerequisites: all courses semesters I-VII.

*1 lecture hours, 1 semester hours*

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## *Chiropractic Skills and Technique*

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CHIROPRACTIC SKILLS AND TECHNIQUE 511/ 511L

### **Chiropractic Examination Skills I: Palpation and Biomechanics of the Spine and Pelvis**

This lecture and laboratory course addresses the biomechanics and chiropractic assessment procedures of the spinal and pelvic joints. The student is introduced to the concepts of biomechanics as they relate to the

kinematics and kinetics of the spine and pelvis and the structure and functioning of the tissues of the musculoskeletal system. This information is coupled with the diagnostic tools of static and motion palpation as they pertain to the assessment of spinal joint functioning.

*2 lecture hour, 2 semester hours/3 laboratory hours, 1.5 semester hours*

CHIROPRACTIC SKILLS AND TECHNIQUE 522/522L

### **Chiropractic Examination Skills II: Extremity Biomechanics**

This course is a continuation of CH511. Students continue to develop their skills of spinal assessment. Students are also introduced to the biomechanics and assessment procedures related to the extremities. Methods of spinal, soft tissue, and extremity assessment are reviewed and practiced. Prerequisites: CH511; Co-requisite AN512, AN526.

*2 lecture hour, 2 semester hour/ 3 laboratory hours, 1.5 semester hours*

CHIROPRACTIC SKILLS AND TECHNIQUE 613/613L

### **Technique Procedures I: Introduction to Full Spine Technique**

This course introduces students to full spine adjustive procedures from occiput to the pelvis. The course begins with a review of biomechanics and assessment procedures presented in Technique 511 and 522. Selected spinal conditions are presented and discussed as it pertains to diagnosis, differential diagnosis and case management. Prerequisite: TE511/TE511L

*1 lecture hour, 1 semester hour/ 3 laboratory hours, 1.5 semester hours*

CHIROPRACTIC SKILLS AND TECHNIQUE 624/624L

### **Technique Procedures II: Intermediate Full Spine and Upper Extremity Adjusting**

Principles of patient management and common clinical conditions of the head, neck, thoracic and upper extremity regions are presented. Evidence-based diagnostic and treatment protocols are stressed along with conservative and proper referral and co-management. The laboratory portion is a review and practice of new and previous techniques taught with an emphasis on skill refinement. Intermediate level spinal techniques and upper extremity techniques are presented and practiced. Prerequisites: TE613/TE613L, TE511/TE511L, TE522/TE522L

*2 lecture hours, 2 semester hours/ 4 laboratory hours, 2 semester hours*

# Chiropractic

## CHIROPRACTIC SKILLS AND TECHNIQUE 625/625L

### **Technique Procedures III: Soft Tissue**

Students are introduced to the concepts of soft tissue diagnostic procedures and treatment procedures. These include the etiology, pathophysiology, diagnosis and treatment of soft tissue dysfunction and trauma. Differential diagnosis and case management of soft tissue lesions are preselected.

The laboratory portion covers the diagnosis and treatment of muscle hypertonic states. Prerequisites: TE511/TE511L, TE522/TE522L, AN512, AN526, DX612/DX612L

*2 lecture hours, 2 semester hours/2 laboratory hours, 1 semester hour*

## CHIROPRACTIC SKILLS AND TECHNIQUE 716/716L

### **Technique Procedures IV: Intermediate Full Spine and Lower Extremity Technique**

Technique procedures, assessment procedures, and biomechanics are presented as they relate to the spine and lower extremity. Students continue to be introduced to new procedures which are practiced in lab. Prerequisites: TE624/TE624L

*2 lecture hours, 2 semester hours/ 4 laboratory hours, 2 semester hours*

## CHIROPRACTIC SKILLS AND TECHNIQUE 717L

### **Technique Procedures V: Soft Tissue II**

This course will begin by reviewing soft tissue techniques taught in TE625/TE625L. Students then refine their palpatory and therapeutic soft tissue manual treatment skills. Prerequisites: TE716/TE716L

*2 laboratory hours, 1 semester hour*

## CHIROPRACTIC SKILLS AND TECHNIQUE 728/728L

### **Technique Procedures VI: Advanced Chiropractic Technique I (and Lab)**

## CHIROPRACTIC SKILLS AND TECHNIQUE 819

### **Technique Procedures VII: Advanced Chiropractic Technique II**

This course is a review of all techniques taught at UBCC. This course also serves as a critique course for other techniques utilized in practice. Case management utilizing various chiropractic technique approaches are discussed and critically evaluated. Prerequisites: all courses semester I-VI.

*1.5 lecture hours, 3 laboratory hours, 3 semester hours*

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## Clinical Nutrition

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## CLINICAL NUTRITION 621

### **Clinical Nutrition I: Pathology and Assessment**

This course introduces the student to disease states and abnormal conditions due to biochemical deficiencies and abnormal metabolic states. Students are introduced to the methods of nutritional assessment through history and observation. Prerequisites: BC511, DX613, PH612, PA611.

*1 lecture hour 1 semester hour*

## CLINICAL NUTRITION 712

### **Clinical Nutrition II: Treatment and Management**

This course is a continuation of CN621. Students are presented with abnormalities of a nutritional origin and begin to develop a treatment and management plan. Prerequisite: CN621.

*2 semester hours, 2 semester hours*

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## Clinical Services

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## CLINICAL SERVICES 721

### **Clinical Services I**

Students under the supervision of licensed faculty begin to administer care to patients at the UBCC Health Center. Students are introduced to the procedures and practices utilized by the health center through lectures and practical demonstrations. Students refine their skills in history taking, physical examination, radiology, technique, case management and clinical decision making. Prerequisites: all courses in semesters I- V.

*2 lecture hour, 4 clinic hours, 3 semester hours*

## CLINICAL SERVICES 812

### **Clinical Services II**

Under supervision of licensed faculty interns administer care to patients. Each patient diagnosis and management plan is reviewed and approved by a clinic faculty member prior to the initiation of patient care. Students are assessed via evaluation by faculty. Prerequisites: all courses semesters I-VI.

*25 clinic hours, 12.5 semester hours*

## CLINICAL SERVICES 823

### **Clinical Services III**

Interns continue to administer care to patients under the supervision and approval of licensed faculty. Interns are monitored as to their progress towards completing the qualitative and quantitative requirements as set forth by the UBCC Health Center. As-

essment of an intern's clinical competency is performed by faculty. Prerequisites: all courses semesters I-VII.

*25 clinic hours, 12.5 semester hours*

## CLINICAL SERVICES 824

### **Clinical Services IV**

Interns continue to administer care to patients under supervision of faculty. Progress is monitored by faculty.

*25 clinic hours, 4 semester hours*

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## Diagnosis

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## DIAGNOSIS 611/611L

### **Diagnostic Skills I: Physical Examination**

This lecture and laboratory course is designed as an introduction to the skills required to examine and diagnose the skin, eyes, ears, nose and throat, as well as the cardiovascular, respiratory, gastrointestinal and genitourinary systems. Selected topics regarding the diagnosis of the neuromusculoskeletal system will also be covered, however, comprehensive coverage of this material will be accomplished in the various clinical orthopedic and neurology courses within the curriculum. The student will learn the selection of appropriate examination and diagnostic procedures which correspond to the patient's history and complaint. The student will also expand upon their knowledge base from their previous course in medical interviewing (Diagnosis 521). The successful student will also learn how to select and use diagnostic equipment and specific procedures for carrying out these examinations. Integration of these skills into the comprehensive management of the patient will be emphasized which will allow the student to properly develop the clinical decision making skills required of a primary care physician. Prerequisites: All Anatomy Classes, PH521

*2 lecture hours, 2 semester hours (611)*

*3 laboratory hours, 1.5 semester hours (611L)*

## DIAGNOSIS 612 /612L

### **Diagnostic Skills II: Orthopedics and Neurology**

This lecture and laboratory course introduces students to the procedures necessary to examine the neuromusculoskeletal system. Normal and abnormal findings are presented and discussed. Emphasis is placed on students understanding of clinical anatomy

## Chiropractic

and interpretation of positive tests and signs. Prerequisites: AN525, AN526, TE511, TE522, NS521, PP523.

*2 lecture hours, 2 semester hours (612)*

*4 laboratory hours, 2 semester hours (612L)*

DIAGNOSIS 623/623L

### **Diagnostic Skills III: Orthopedics and Neurology**

This course is a continuation of Diagnosis 612. Emphasis is on clinical neurology. Clinical neuroanatomy and examination technique are utilized to problem solve the localization of neurological lesions are discussed. Prerequisites: DX611/DX611L, DX612/DX612L, NS521, NS612

*2 lecture hours, 4 laboratory hours, 2 semester hours*

DIAGNOSIS 624

### **Laboratory Diagnosis**

This course focuses on the principle laboratory tests used to evaluate and diagnose various pathological conditions. The student will learn the selection of appropriate laboratory and diagnostic procedures which correspond to the patient's history and complaint. The student will also expand upon their knowledge base from previous courses in physiology and biochemistry in learning about and understanding the rationale behind common laboratory procedures, including serum, urine and stool studies. Various functional physiologic studies will also be presented. Integration of the knowledge of common laboratory tests into the comprehensive management of the patient will be emphasized which will allow the student to properly develop the clinical decision making skills required of a primary care physician. Prerequisites: DX611, BC511, PH612, PA611

*3 lecture hours, 3 semester hours*

DIAGNOSIS 725

### **Special Populations**

This course introduces the student to the health care needs of the developing child and mother from conception to birth to childhood and adolescence. Complications of pregnancy, delivery, post-partum care, and the chiropractic management of the obstetrical patient are discussed. The examination, conditions and management of the pediatric patient are presented. Prerequisites: all courses semesters I-V.

*3 lecture hours, 3 semester hours*

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## Differential Diagnosis

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DIFFERENTIAL DIAGNOSIS 711/711L

### **Differential Diagnosis and Treatment of Internal Disorders**

This lecture and skill laboratory course is designed as an introduction to the skills required to examine and differentially diagnose the cardiovascular, respiratory, gastrointestinal and genitourinary systems. Selected topics regarding the endocrine and lymphatic system will also be covered. The student will learn the selection of appropriate examination, diagnostic and therapeutic procedures which correspond to the patient's history and complaint. The student will also expand upon their knowledge base from previous courses in medical interviewing, physical examination, and laboratory diagnosis and learn how to select and use diagnostic equipment, diagnostic tests and specific procedures used in the differential diagnosis of internal disorders. Integration of these skills into the comprehensive management of the patient will be emphasized which will allow the student to properly develop the clinical decision making skills required of a primary care physician. Prerequisites: DX611/DX611L, DX624, DX623/DX623L, PA622, PH612, DI623

*5 lecture hours, 2 laboratory hours, 6 semester hours*

DIFFERENTIAL DIAGNOSIS 722

### **Differential Diagnosis III: Neuromusculoskeletal**

This course is a presentation of the diseases and conditions affecting the neuromuscular-skeletal system. Disorders affecting the spine, extremities, central and peripheral nervous system are reviewed. Neurological and orthopedic testing are covered as they relate to the differential diagnosis of these systems. Function of the human locomotor system and how other systems can affect it are stressed. Prerequisites: All Courses, Semesters I-IV.

*4 lecture hours, 2 laboratory hours, 5 semester hours*

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## Emergency Procedures

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EMERGENCY PROCEDURES 711

### **Emergency Procedures**

Training in first aid principles is given in lectures and demonstrations dealing with the

care of emergencies and accidental injuries. Treatment of wounds, fractures, poisoning, lacerations, shock, hemorrhages, heat exhaustion, drowning and burns is taught. Students are trained and receive certification in the administration of CPR.

*1 lecture hour, 2 laboratory hours, 2 semester hours*

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## Microbiology and Public Health

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MICROBIOLOGY 521

### **Clinical Microbiology, Introduction to Infectious Diseases I**

This course introduces the student to the basic concepts of microbiology with emphasis on the structure, growth, metabolism and genetics of bacteria. Host-parasite relationships of representative bacterial, fungal, viral, and protozoan pathogens are examined. A survey of microbial diseases includes modes of transmission, symptoms, diagnosis, physical and chemical methods of disinfection, sterilization and treatment. Presentations include lecture, laboratory and case studies. Prerequisites: BC511, AN511

*2 lecture hours, 2 semester hours*

MICROBIOLOGY 612

### **Infectious Diseases II**

This course is a continuation of MB521. Common infectious diseases are presented from a microbiological perspective. Prerequisites: MB521, PH521

*2 lecture Hours, 2 semester hours*

MICROBIOLOGY 623

### **Public Health I**

This course covers the current environmental and public health concerns and issues. The course integrates health with diet, air and water pollutants, noise and substance abuse, compares community hygiene and industrial hygiene, defines epidemiology, and recognition of major communicable and non-communicable diseases. Prerequisite: MB612.

*2 lecture hours, 2 semester hours*

MICROBIOLOGY 724

### **Public Health II: Community Health and Wellness**

This course emphasizes interventions which promote wellness and prevent disease. Students will learn health risk assessment which will help motivate patients to make lifestyle changes that promote wellness and prevent

# Chiropractic

disease.

2 lecture hours, 2 semester hours

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## Neuroscience

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NEUROSCIENCE 521

### Neuroscience I

This course focuses on the anatomy of the nervous system with special emphasis on sensory and motor systems. However all areas of the central nervous system are discussed to give the student a broad understanding of brain function. Clinical correlations are made which are applicable to each region or system of the CNS. The laboratory section of the course includes presentation of prosections and discussion of case studies. Instruction includes lecture, case studies and demonstration of prosections in the laboratory. Prerequisites: AN511, AN512, AN514.

3 lecture hours, 3 semester hours

NEUROSCIENCE 612

### Neuroscience II

This course is a continuation of NS521, with the focus on the physiology of the nervous system. The sensory and motor systems are discussed in detail. An emphasis is placed on the correlation of anatomical structure to physiological function and clinical dysfunction. The special sense organs and systems are studied in detail. The laboratory introduces students to neurological tests performed on patients, with an emphasis on understanding the underlying neuro-anatomy and neurophysiology that is the basis for these tests. Prerequisite: NS521, PP523, PH521, AN525.

3 lecture hours, 3 credit hours

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## Pathology

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PATHOLOGY 611

### Fundamentals of Pathology

This course is a study of pathophysiological processes and the gross, microscopic, and clinical manifestations of disease. Basic processes of inflammation, repair, degeneration, necrosis, immune response, and neoplasia are presented. This course is also an introduction to diseases of the lymphatic, hematopoietic, and neuromusculoskeletal systems. Laboratory includes the study of gross and microscopic changes as well as

clinical presentations of various diseases and functional disturbances. Prerequisites: All anatomy courses, PH521, BC511

2 lecture hours, 1 laboratory hour, 2.5 semester hours

PATHOLOGY 622

### Systems Pathology

This course is a continuation of PA611. This course emphasizes the pathological basis of systemic diseases of the cardiovascular, respiratory, gastrointestinal, urogenital, endocrine, and renal systems. The gross, microscopic, and clinical manifestations of various disease processes are presented. Prerequisites: PA611, PH612.

4 lecture hours, 2 laboratory hours, 5 semester hours

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## Physiology

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PHYSIOLOGY 521

### Organ System Microscopic Anatomy and Physiology I

This class will focus on understanding the microscopic anatomy and physiology of the organs of the immune and endocrine systems. Major emphasis will be placed on the role of non-specific and specific defense mechanisms in health maintenance and provide an introduction into immune system disruption as it relates to hypersensitivity and autoimmunity. The endocrine system will be studied in its primary role in cellular communication and maintenance of homeostasis. Special emphasis will be placed on the interaction and communication between the nervous and endocrine systems.

2 lecture hours, 2 semester hours

PHYSIOLOGY 612

### Organ System Microscopic Anatomy and Physiology II

The microscopic anatomy and physiology of the cardiovascular, respiratory, digestive and reproductive systems will be introduced. An emphasis will be placed on the relationship of tissue organization and function of the organ systems. Laboratories in this class will utilize case studies to emphasize how an understanding of normal physiologic mechanisms and how they are crucial to understanding pathophysiology. Prerequisites: AN511, PH521.

4 lecture hours, 2 laboratory hours, 5 semester hours

PHYSIOLOGY 713

### Toxicology and Pharmacology

This course is the study of drugs and chemicals and how they interact with the living organism. Pharmacology is a study of the sites, absorption, and metabolism of common drugs. Toxicology studies the adverse reactions of drugs and poisons. The therapeutic use and toxic effects of various drugs, chemicals, nutritional supplements and other substances are studied. Prerequisites: PH612, PA611, NS612, PA622

2 lecture hours, 2 semester hours

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## Physiological Therapeutics

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PHYSIOLOGICAL THERAPEUTICS 711/711L

### Physiological Therapeutics I

This course is an introduction to the clinical use of heat, cold, high volt galvanism, interferential current, low volt galvanism, ultrasound, electrical muscle stimulation, diathermy, and paraffin. The student is instructed on the development of a clinical management plan utilizing adjunctive therapies.

1 lecture hours, 2 laboratory hours, 1 semester hours

PHYSIOLOGICAL THERAPEUTICS 722 /722L

### Physiological Therapeutics II: Rehabilitation

In this course current concepts of active rehabilitative management of injuries, dysfunctions and conditions of the spine and extremities common to the practice of chiropractic are presented. The student receives instruction in a variety of assessment and clinical management protocols including spinal stabilization, therapeutic exercise, PNF, stretching, sensorimotor training and patient education. The application of outcomes and psychosocial risk factors assessment in developing the treatment plan is addressed.

2 lecture hours, 2 laboratory hours, 2 semester hours

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## Principles and Practice

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PRINCIPLES AND PRACTICE 511

### Principles and Practice I: History and Philosophy

This is a course in which the history of healing is traced from its known origins through discovery of chiropractic to the present day. The basic concepts of chiropractic philoso-

# Chiropractic

phy are discussed, as well as their current interpretation and clinical significance. Particular emphasis is placed upon chiropractic as a distinct profession in the health care community.

*2 lecture hours, 2 semester hours*

## PRINCIPLES AND PRACTICE 512

### **Principles and Practice II: Communications**

Introduction to the principles of evidence based practice. Students will be introduced to the resources used to search for quality evidence including search criteria, weighing of evidence and application and use of evidence in a clinical care setting. Students will also be introduced to the various resources of the UB library including searchable databases. *2 lecture hours, 2 semester hours*

## PRINCIPLES AND PRACTICES 523

### **Principles and Practice III: Subluxation Complex and Its Philosophical Concepts**

This course introduces students to the current concepts of the subluxation complex and how it is integrated with the science, art, and philosophy of chiropractic care. The course covers the various components of the subluxation complex, including biomechanical, pathophysiological, and neurological aspects. This information is correlated to the effects of chiropractic manipulation of the subluxation complex. Prerequisite: PP511, AN512.

*2 lecture hours, 2 semester hours*

## PRINCIPLES AND PRACTICE 624

### **Principles and Practice IV: Research Methods and the Philosophy of Science**

In this course students will expand their knowledge of types of published studies. With emphasis on methodology, instrumentation, statistics and computer-based searches of the literature. Students will complete a proposal for either a Senior Paper or a Research Thesis.

*2 lecture hours, 2 semester hours*

## PRINCIPLES AND PRACTICE 711

### **Ethics and Jurisprudence**

*2 lecture hours, 2 semester hours*

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## Psychology

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## PSYCHOLOGY 711 (FORMERLY PS 811)

### **Clinical Psychology**

This course is designed to familiarize stu-

dents with current psychological theory and practice. Students are instructed in behavioral assessment and recognition of psychological disorders. Interviewing and counseling techniques are presented as well as criteria for appropriate referral of patients to providers of psychological services. Prerequisite: All courses, Semesters I-V.

*2 lecture hours, 2 semester hours*

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## Radiology

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## DIAGNOSTIC IMAGING 521

### **Diagnostic Imaging I: Normal Anatomy – Spine**

This course introduces students to radiographic anatomy, variants, and congenital anomalies as they relate to the spine, pelvis, skull, viscera, and extremities. Concepts as they relate to image formation, film reading, and report writing are introduced. Prerequisites: AN512

*2 lecture hour, 2 laboratory hours, 3 semester hours*

## DIAGNOSIS IMAGING 612

### **Diagnosis Imaging II: Normal Anatomy –Extremities**

This course is a continuation of DI521. Students continue to develop their skills of radiographic interpretation as they relate to normal anatomical structures of the various parts of the body. Prerequisite: DI521, AN526

*1 lecture hour, 2 laboratory hours, 2 semester hours*

## DIAGNOSTIC IMAGING 623

### **Diagnostic Imaging III: Bone Pathology**

This course introduces students to the clinical and radiographic manifestations affecting osseous structures due to neoplasia, tumor-like conditions, metabolic and endocrine disorders, and normal variants. Students are introduced to special imaging as related to further evaluation of these conditions. Prerequisites: DI612, PA611, PA612, all anatomy courses.

*2 lecture hours, 2 laboratory hours, 3 semester hours*

## DIAGNOSTIC IMAGING 714

### **Diagnostic Imaging IV: Arthritis and Trauma**

This course further develops students skills in the clinical and radiographic manifestations of osseous structures. Emphasis is

placed on the interpretation and recognition of disorders due to inflammatory and non-inflammatory arthritides, and trauma. Special imaging as related to further evaluation of these conditions is presented. Prerequisite: DI623.

*2 lecture hours, 2 laboratory hours, 3 semester hours*

## DIAGNOSTIC IMAGING 725

### **Diagnostic Imaging V: Chest and Abdomen**

This course covers the interpretation of normal and abnormal clinical and radiographic manifestations of the internal organs. The chest, heart, and abdomen are studied on plain film as well as advanced imaging examination procedures. Prerequisites: all previous DI courses.

*1 lecture hour, 2 laboratory hours, 2 semester hours*

## DIAGNOSTIC IMAGING 726

### **Positioning and Physics**

This course covers the mechanics of x-ray production, film processing, x-ray factors, and radiation safety and protection for doctor and patient. Also covered is the placement and positioning of patients for the taking of x-ray studies. Students are introduced to the policies and procedures utilized by the UBCC Health Center.

*2 lecture hours, 2 laboratory hours, 3 semester hours*

## DIAGNOSTIC IMAGING 827

### **X-Ray Review**

In a clinical setting, students are given a review in a case presentation style of various radiographic findings. Prerequisites: all courses semester I-VI.

*2 laboratory hours, 1 semester hour*

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## Research

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## RESEARCH 711

### **Thesis I**

Students working with their advisor will start work leading to their published Senior Paper or Research Thesis.

*0 lecture hour, 1 semester hour*

# Chiropractic • Computer Engineering

RESEARCH 722

## Thesis II

Students continue to work with their advisor on their Senior Paper or Research Thesis.

*0 lecture hour, 1 semester hour*

RESEARCH 813

## Thesis III

Students continue to work with their advisor to complete their Senior Paper or Research Thesis.

*0 lecture hour, 1 semester hour*

RESEARCH 824

## Thesis IV

Completion and Submission

*0 lecture hour, 1 semester hour*

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## Computer Engineering

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COMPUTER ENGINEERING 408

### Operating Systems

Structure and design issues in modern operating systems. Topics may include OS structure; Threads, CPU scheduling and synchronization of processes; deadlock management; main and virtual memory management; file management; file system interface; I/O) structure Prerequisite: Computer Science 102, Computer Engineering 312.

*3 semester hours*

COMPUTER ENGINEERING 446 (CPEG 446/ELEG 446)

### MEMS (Micro-Electro-Mechanical Systems)

Basic micro fabrication techniques, MEMS materials and their properties, MEMS device design and simulation, MEMS packaging and assembly, signal testing and MEMS reliability analysis. MEMS industrial applications in various areas will also be discussed. Students used ANSYS FEM software to design and simulate their behavior.

COMPUTER ENGINEERING 447

### Logic Synthesis Using FPGAs

Logic design using textual design entry, VHDL. Behavioral, structural and data flow descriptions. Technology-dependent vs. technology-independent design. CPLD, SRAM and antifuse technologies. Rapid prototyping and retargeting designs. A major design project. Prerequisite: Computer Engineering 315.

*3 lecture hours, 3 semester hours*

COMPUTER ENGINEERING 448

### Introduction to VLSI Design

Design and implementation of a very large scale integrated circuits. CMOS and BiCMOS technologies, basic topological structure of ICs, clocking characteristics, resistance, capacitance and power estimation, System-level design and implementation issues. Custom layout and verification using CAD tools. Synthesis of designs from VHDL descriptions. Term project will include the design and testing of an integrated circuit. Prerequisites: Computer Engineering 315 and Electrical Engineering 348.

*3 lecture hours, 3 semester hours*

COMPUTER ENGINEERING 458 (CPEG 458/ELEG 458)

### Analog VLSI

Modeling, design and analysis of analog VLSI circuits. CMOS processing and layout, current mirrors, Opamp, comparators, S/H voltage references, switched-capacitor circuits, data converters, filters and PLLs. Students design analog VLSI layouts, extract the netlists and simulate the circuit behavior. Transistors sizing will also be discussed. EDA tools PSPICE, Mentors Graphics are used.

COMPUTER ENGINEERING 460

### Introduction to Robotics

Basic Robotics, including: position and velocity sensing, actuators, control theory, robot coordinate systems, robot kinematics, differential motions, path control, dynamics, and force control. Robot sensing, simulation of manipulators, automation, and robot programming languages are also investigated. Prerequisites: Computer Science 102, Electrical Engineering 360, Math 214 or 314 or permission of instructor.

*3 lecture hours, 3 semester hours*

COMPUTER ENGINEERING 471

### Data and Computer Communications

Introduction to data communication. Frequency response, bandwidth, filtering and noise. Fourier series and Fourier transform. Information theory concepts: Nyquist's theorem, Shannon's and Sampling theorems. Analog and digital modulation techniques. Pulse Code Modulation (PCM). Communication systems circuits and devices. Data encoding. Physical layer protocols. Data link control (point to point communication, design issues, link management, error control, flow control). Multiplexing and switching.

Prerequisite: Computer Science 102, Computer Engineering 210.

*3 lecture hours, 3 semester hours*

COMPUTER ENGINEERING 472

### Computer Networks

Introduction to fundamental concepts in the design and implementation of computer communication networks, their protocols, and applications. Topics to be covered include: overview of network architectures, applications (HTTP, FTP), network programming interfaces (e.g., sockets), transport (TCP, UDP), flow control, congestion control, IP, routing, IPv6, multicast, data link protocols, error detection/correction, multiple access, LAN, Ethernet, wireless networks, and network security. Prerequisite: Computer Engineering 471 or permission from instructor.

*3 lecture hours, 3 semester hours*

COMPUTER ENGINEERING 473

### Local Area Networks

Examination of wired and wireless Local and Metropolitan Area Network technologies, protocols, and the methods used for implementing LAN and MAN based enterprise intranets. The IEEE 802 media access control (MAC) protocols are examined. The 802.2 logical link control, 802.3/Ethernet, 802.3 token bus, and the 802.5 token ring protocols are analyzed, and the construction of LAN-based enterprise intranets is examined through a detailed analysis of bridging, routing, and switching techniques. High-speed LAN technologies are discussed through an examination of FDDI, Fast Ethernet, 100VG AnyLAN, ATM LAN and fibre Channel protocols along with the standards for Gigabit and 10 Gigabit Ethernet. The new and emerging wireless LAN and MAN standards are also examined. The 802.11 (WiFi) wireless LAN and 802.15 (Bluetooth) wireless PAN standards are discussed. Prerequisite: Computer Engineering 471.

*3 lecture hours; 3 semester hours*

COMPUTER ENGINEERING 481

### Mobile Communications

This course covers the basic technologies in the field of wireless and mobile communications. The following topics are covered in the course: wireless transmission, media access control, satellite systems, broadcast systems, wireless LANS, wireless ATM, network layer protocols, transport protocols and support for mobility. Pre-requisites: Computer

# Computer Engineering

Engineering 471 or Computer Engineering 472 or permission of instructor.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 482

### **Network Administration**

Internetworking basis. Bridging and Switching Fundamentals. Routing basic. Network management fundamentals. Network architecture. Security. Troubleshooting. Prerequisites: Computer Engineering 471 or Computer Engineering 473 and permission of instructor.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 489

### **Software Engineering**

Structural development methodology for large software systems. Planning requirements, design, test, and validation. Advanced topics in software development. Prerequisite: Computer Science 102 and senior status.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 500

### **Graduate Co-op/Internship in Computer Engineering**

By arrangement.  
*1-3 semester hours*

## COMPUTER ENGINEERING 510

### **Introduction to Computer Architecture**

Instruction set; data path and controller design for computers. Design and analysis of a RISC processor including integer and floating point pipeline design. Cache and virtual memory design, interrupts and DMA. Prerequisite: Computer Engineering 312 or equivalent background.  
*3 lecture hours, 3 semester hours*

## COMPUTER ENGINEERING 540

### **Image Processing**

This is a project-oriented course. Students will learn and implement FFT with applications, image enhancement, image restoration, image compression, and image tomography. Projects will be conducted on workstations. Prerequisite: Electrical Engineering 443.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 548 (CEG 548/ELEG 548)

### **Low Power VLSI Circuit Design**

With the rapid development of mobile computing, low power VLSI design has become a very important issue in the VLSI industry. A variety of low-power design methods are employed to reduce power dissipation of VLSI chips. This course is designed to cover low-power design methodologies at various

design levels (from system level to transistor level). The basic low-power design strategies will be introduced in the class. Students will use the learned knowledge to design low-power VLSI circuits. Upon completion of this course, students will be able to analyze the power consumption of VLSI circuits, and design low-power VLSI circuits using various strategies at different design levels. The major target is to design VLSI chips used for battery-powered systems and high-performance circuits not exceeding power limits.  
*3 semester hours*

## COMPUTER ENGINEERING 550

### **Advanced VLSI Design**

Implementation of custom VLSI designs, digital and analog simulation, fault tolerant design, design for testability. A major project will include the implementation of a digital integrated circuit. Prerequisites: Computer Engineering 448D.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 457

### **Electronic Design Using Programmable Analog Arrays**

Use of design methodologies to implement analog circuits using programmable analog arrays. Introduction to design tools for circuit implementation. Laboratory experience includes design of analog filters, photoplethysmography, a non-invasive method of measuring blood pulsations, temperature measurements with PWM fan control, motor control using PID controllers, among others. Design tools include MatLab and design tools from Anadigm, Inc. (schematic capture and simulation)

## COMPUTER ENGINEERING 561

### **Network Security**

Conventional encryption and message confidentiality, public-key cryptography and message authentication. Authentication applications, electronic mail security, IP security, web security, firewalls, security in mobile network and other security systems. Prerequisites: Computer Engineering 471 or 473.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 570

### **Advanced Robotics**

Advanced robotics and automation topics and techniques, including: active robotic sensing, intelligent and integrated manufacturing systems, robotic inspection, observation under uncertainty, multisensor feedback

control of manipulators and mobile robots, advanced simulation and monitoring of robotic systems, high level modeling and control, and other topics. Prerequisites: Computer Science 460, Computer Engineering 460 or permission of instructor.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 584

### **Machine Perception**

An introduction to sensing and machine vision. Vision algorithms that are usable in practical applications, sensing mechanisms and various types of sensed data representation, sense data processing and interpretation for different applications. Prerequisites: Computer Science 400, Computer Engineering 312 and Electrical Engineering 443.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 585

### **Computer Vision**

A project-oriented course designed to familiarize the student with the computer image display, processing, and various limitations. The processing includes edge detection, Hough transform, thinning algorithms, moment invariant methods, relaxation algorithms, among others. Prerequisite: Computer Science 400, Computer Engineering 312, Electrical Engineering 443.  
*3 lecture hours; 3 semester hours*

## COMPUTER ENGINEERING 597 A

### **Master's Project**

Lecture hours and topics to be arranged with Department Chair.  
*1 semester hour*

## COMPUTER ENGINEERING 597 B

### **Master's Project**

Lecture hours and topics to be arranged with Department Chair.  
*2 semester hours*

## COMPUTER ENGINEERING 597 C

### **Master's Project (completion)**

Lecture hours and topics to be arranged with Department Chair.  
*1 semester hour*

## COMPUTER ENGINEERING 598

### **Thesis in Computer Engineering**

Lecture hours, semester hours and topics to be arranged with Department Chair.  
*3-6 semester hours*

# Computer Engineering • Computer Science

COMPUTER ENGINEERING 599

## Independent Study in Computer Engineering

Independent study of advanced topics in Computer Engineering and submission of project report as required. Problem assignment to be arranged with and approved by the Department Chair.

*3 semester hours*

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## Computer Science

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COMPUTER SCIENCE 400

### Object-Oriented Programming Using C++

This course introduces the modern object oriented programming philosophy using C++ to the beginning graduate students. The emphasis is on developing the programming thought process in terms of objects and their interactions to each other. Concepts covered include data hiding, code reuse through inheritance, polymorphism, templates, exception handling, developing appropriate class hierarchy and code maintenance for large software projects. Prerequisites: Computer Science 102 or equivalent background.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 410

### Java Programming

Object oriented programming, using Java, packages, interfaces, multi-threading, classes, inheritance, exceptions, interfaces, native methods, applets. Prerequisite: Computer Science 400.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 411

### Advanced Object-Oriented Programming with JAVA

Covered topics include advanced features of Java, such as Database inter-connectivity (JDBC) with Servlets and JSP, remote method interface (RMI), distributed applications objects using CORBA and JNDI, Java Beans, introspection and reflection, Enterprise Java applications with EJB, interfacing Java to C++ with JNI, and additional advanced topics. A focus on developing components and packages. A major project is developed. Prerequisite: Computer Science 410.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 435

### Unix System Programming

Introduction to shell programming and system in Unix/Linux environments. Various

commands, tools, filters and specification languages are studied. System calls to deal with files, processes, pipes, three inter-process communication facilities (semaphores, shared memory, and message queue), and signals are introduced. Prerequisite: Computer Science 400.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 440

### Windows Programming

This course covers Graphical User Interface (GUI), design and Windows programming using Visual C++ and Microsoft Foundation Class (MFC) library. Topics covered include windows architecture, message/event driven programming, designing Dialog based, SDI and MDI applications, Document/View architecture, Device Contexts, Database access using the MFC ODBC classes and ADO. A comprehensive project is assigned towards the end of the course, which covered important windows programming concepts. Prerequisite: Computer Science 400.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 450

### Data Base Design

Database system architecture; management and analysis of files, indexing, hashing, and B+trees; the relational model and algebra; the SQL database language; database programming techniques; database design using Entity-Relationship, and extended E-R modeling; basics of normalization. Theoretical and practical issues in database design, programming, and implementations. Prerequisite: Computer Science 400.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 460

### Introduction to Robotics

Basic robotics including: position and velocity sensing, actuators, control theory, robot coordinate systems, robot kinematics, differential motions, path control, dynamics and force control. Robot sensing, simulation of manipulators, automation and robot programming, languages are also investigated. Prerequisite: Computer Science 102, Math 214 or 314, or permission of instructor.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 485

### Software Design Patterns

Introduce design patterns and software architectures. Combines pattern theory with

examples to show why and when to use patterns and how to implement them. How to apply design patterns at the enterprise level. The use of design patterns to design and implement systems of high stability and quality. Compare and contrast patterns, including differences between Mediator and Façade. Discuss relationships between patterns. Study how patterns are collaborated within domains to solve complicated problems.

*3 semester hour*

COMPUTER SCIENCE 500

### Graduate Co-op/Internship in Computer Science

By arrangement.

*1-3 semester hours*

COMPUTER SCIENCE 502

### Analysis of Algorithms

A course in advanced data structures and high-level algorithms. Varied uses of recursion. Graph representations and algorithms including traversals, path finding, closure, and spanning trees. Sorting files. Weighted and balanced trees; Hashing and collision handling. Complexity and analysis of algorithms. Prerequisite: Computer Science 102 or equivalent.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 503

### Operating Systems

An advanced implementation oriented course in structure and design of operating systems. Scheduling and time management; processes and operating systems primitives; Deadlock handling techniques in operating systems; Space management and external device management. Prerequisite: Computer Science 102, Computer Engineering 312, Knowledge of C/C++.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 504

### Artificial Intelligence

Foundations of the theory of Artificial Intelligence. Game playing, pattern recognition, description of cognitive processes, heuristic decision procedures, general problem solvers. Learning and robotics. Discussion of the relationship with human thought process. Extensive Lisp programming. Pre-requisite: Computer Science 102 or permission of instructor.

*3 lecture hours; 3 semester hours*

# Computer Science

COMPUTER SCIENCE 509

## **Automata Theory**

Theory of automata and learning machines. Finite-state sequential machines and functions. Transition preserving functions, Generators and minimal generating sets. Input semigroup, Isomorphisms and Auto-morphisms. Prerequisite: Computer Science 227. *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 520

## **Theory of Computation**

Finite automata and Pushdown automata; Register machines; Recursive functions and sets; Languages, regular expressions; Context-free languages; Regular and context-free grammars; Pumping lemmas. Turing machines, Church-Turing thesis. Post-correspondence problem; Computability and complexity. Prerequisite: Computer Science 227 and knowledge of computer programming. *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 545

## **Component Based Software Design**

Modern component based software design approaches using both the Component Object Model (COM) as well as the CORBA technologies. In-depth look at the infrastructure of COM components presenting of concepts of class factories, interfaces (standard and custom), in-proc and local server components, IDL, type libraries, proxy/stubs and marshalling, automation and I Dispatch interface, structured storage and ActiveX controls. The distributed form of COM referred to as DCOM and its newest form is known as COM+, which integrates the transaction, and queuing capabilities are examined. A comparison of the CORBA technology is made by explaining its architecture and remote capabilities. Prerequisite: Computer Science 440, Prerequisite by topic: 1. Good background in C++ programming, 2. Some knowledge of Windows Programming. *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 550

## **Multimedia Database Systems**

The issues in multimedia (audio, images and video), multimedia compression, multimedia operating systems, multimedia communications, multimedia indexing, querying and retrieving, and web database systems, which have been enormously developed recently, and are playing important roles in the areas

of business, entertainment, medicine and education. The goal of this course is to give in-depth understandings to media themselves with emphases on other issues related to DBMS, operating systems and communications.. *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 551

## **Advanced Database**

Advanced study of Relational databases including indexing structure, query optimization, rule and cost-based optimization, transactions and concurrency, recovery techniques, security, distributed database, data mining and other emerging database technologies. Prerequisite: Computer Science 450 *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 555

## **Web-Based Application Development**

Introduction to fundamental issues in designing a web-based application. Review of the web technologies such as HTML, VBScript, JavaScript, DHTML, Java, XML and server-side technologies using Active Server Pages (ASP), CGI and Java Server Pages (JSP). Design issues include the creation of tiered and scalable applications by the use of COM+ components involving Microsoft Transaction Server and the Java approach of Enterprise Java Beans. Different projects are assigned to create dynamic, database-driven E-Commerce solutions involving, order tracking systems, inventory management, advertising management, creating score reports, personalizing the shopping experience and secure credit card transactions. Wireless E-Commerce applications and developing business-to-business application using XML, SOAP and Biztalk Servers. Prerequisite: Computer Science 400. *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 560

## **Performance Evaluation and Analysis**

This course covers the basic theory and practice of computer systems performance evaluation. The course focuses on three major aspects of performance analysis, measurement, simulation and analytical modeling using queuing theory. The topics will include measurement techniques, monitor tools, simulation models, stochastic processes, queuing theory and analytical modeling techniques. Prerequisite: Background in computer archi-

ture and probability and consent of the instructor.

*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 561

## **Network Security**

Conventional Encryption and Message Confidentiality, Public-key Cryptography and Message Authentication. Authentication Applications, Electronic Mail Security, IP Security, Web Security, Firewalls, Security in Mobile Network and other Security Systems. Prerequisite: Computer Engineering 471 or 473. *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 570

## **Advanced Robotics**

Advanced robotics and automation topics and techniques, including: active robotic sensing, intelligent and integrated manufacturing systems, robotic inspection, observation under uncertainty, multisensor feedback control of manipulators and mobile robots, advanced simulation and monitoring of robotic systems, high level modeling and control, and other topics. Prerequisites: Introduction to Robotics (Computer Science 460 or Computer Engineering 460). *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 580

## **Introduction to Neural Networks**

Introduction to neural computing, and fuzzy logic. Neural network models including feed forward, multilayered networks, back-propagation, fuzzy associative memories, self-organizing maps and adaptive resonance. Applications. Projects to implement networks designed for specific applications. Prerequisite: Proficiency in C or C++, calculus and matrix methods. *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 584

## **Machine Perception**

An introduction to sensing and machine vision. Vision algorithms that are usable in practical applications, sensing mechanisms and various types of sensed data representation, sense data processing and interpretation for different applications. Prerequisite: Computer Science 400, Computer Engineering 312. *3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 590

## **Parallel and Distributed Processing**

Models of parallel computation including

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distributed, multiprocessor, multicomputer. Parallel programming constructs. The mutual exclusion problem, synchronization and communication methods. Multi-computer topologies and topologies and topological embedding. Classes of parallel algorithms and design approaches. Performance analysis of parallel computation, including de-tailed and high level. A major project is required. Prerequisite: Computer Science 400.  
*3 lecture hours; 3 semester hours*

COMPUTER SCIENCE 597 A

## Master's Project

Lecture hours and topics to be arranged with Department Chair.

*1 credit hour*

COMPUTER SCIENCE 597 B

## Master's Project

Lecture hours and topics to be arranged with Department Chair.

*2 credit hours*

COMPUTER SCIENCE 597 C

## Master's Project (completion)

Lecture hours and topics to be arranged with Department Chair.

*1 credit hour*

COMPUTER SCIENCE 598

## Thesis in Computer Science

Lecture hours, semester hours and topics to be arranged with Department Chair.

*3-6 credit hours*

COMPUTER SCIENCE 599

## Independent Study in Computer Science

Independent study of advanced topics in Computer Science and submission of project report as required. Problem assignment to be arranged with and approved by the Department Chair.

*3 credit hours*

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## Computer Science & Engineering (Ph.D.)

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*These courses are open for students enrolled in the Ph.D. degree in Computer Science and Engineering.*

COMPUTER SCIENCE & ENGINEERING 690

## Independent Study

Course taken up by a student with a faculty member on a special topic that may not be broad enough to be offered as a regular

course.

*3 lecture hours, 3 semester hours*

COMPUTER SCIENCE & ENGINEERING 692

## Special Topics in Computer Science

Course offered to allow special topics courses in the general area of Computer Science that do not fit into any of the available areas of specialization.

*3 lecture hours, 3 semester hours*

COMPUTER SCIENCE & ENGINEERING 693

## Special Topics in Computer Engineering

Course offered to allow special topics courses in the general area of Computer Engineering that do not fit into any of the available areas of specialization.

*3 lecture hours, 3 semester hours*

COMPUTER SCIENCE & ENGINEERING 694

## Written Comprehensive Examinations

Students taking comprehensive examinations are required to register for CSE 694.

*0 lecture hours, 0 semester hours*

COMPUTER SCIENCE & ENGINEERING 698

## Teaching Requirement

Ph.D. students assigned teaching courses to fulfill the teaching practicum of the Ph.D. in Computer Science and Engineering are required to register CSE 698.

*0 lecture hours, 3 semester hours*

COMPUTER SCIENCE & ENGINEERING 699

## Seminar (Oral Exam)

Seminar is a zero credit course. It involves attending the regular departmental seminars and presenting one's work in one of the seminars.

*0 lecture hours, 0 semester hours*

COMPUTER SCIENCE & ENGINEERING 710

## Ph.D. Dissertation

The student is expected to work on the accepted topic and come up with original results. S/he has to report the results in the form of a Ph.D. dissertation. The student is encouraged to document the intermediate results in the form of technical reports. S/he is also encouraged to publish these results as they are discovered, in the international professional literature, i.e., refereed conference proceedings and journals. Proof of good work is the acceptance of the results by reputed journals. Intermediate results can also be discussed in departmental seminars. The completed dissertation must be distributed to the dissertation committee members at least

two weeks before the dissertation defense. The committee will read it and certify that the dissertation is a work of substantial merit and that it can be defended. It is the responsibility of the student that the final draft of the dissertation addresses all legitimate concerns of the committee members.

*Varies from 1-12 semester hours*

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## Counseling

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COUNSELING 500

## Principles of Applied Research

This course provides a grounding in the methodology of social science research as it pertains to the human service field. It addresses the following four content areas: 1) The nature of social science research; 2) Critical analysis of social science research; 3) Simple descriptive and inferential statistics; and 4) Action research design.

*3 semester hours*

COUNSELING 505 & 505H

## Helping Relationships

This course provides a definitive view of counseling including the characteristics of the counselor and the elements of the counseling process. Through experiential exercises and videotaped simulated counseling the student will attain skills such as attending, empathic listening, assessing and focusing on important client concerns, structuring the process, and facilitating change. COUN 505H is geared specifically to the needs of Human Resource professionals.

*3-4 semester hours*

COUNSELING 510

## The Counselor as Professional

This course serves as an orientation to the helping profession by addressing issues that impact on the provision of services such as ethics, law, certification, and professional role expectations. Completion of this course must precede internship.

*3 semester hours*

COUNSELING 516

## Social and Cultural Foundations of Counseling

This course examines how social and cultural factors impact on the individual and subsequently how the counselor attends to and addresses the different social forces and cultural differences in the counseling venue.

*3 semester hours*

# Counseling

COUNSELING 521 & 521H

## **Group Process: Application and Theory**

The course focuses on the dynamics of leadership and various membership roles. Alternative theoretical models of groups will be studied. An experiential group experience is required. Counseling 505 and 523 are prerequisites. COUN 521H is geared specifically to the needs of Human Resource professionals.

*3-4 semester hours*

COUNSELING 522

## **Career and Lifestyle Development**

This course provides an introduction to a lifespan approach to career and lifestyle development. Theories, research, and counseling strategies related to career and lifestyle issues are explored. Labor resources and information, career assessment tools, computer assisted career guidance, life roles, cultural considerations, and placement procedures are reviewed as interrelated factors to the study of career development. Counseling 505 and 523 are prerequisites.

*3 semester hours*

COUNSELING 523 & 523H

## **Counseling Theories**

This course surveys the major theories and perspectives of counseling including the Psychoanalytic, Behavioral, Humanistic-Existential, Cognitive, Constructivist-Post Modern, and Systems approaches along with an integrated, eclectic or confluent perspective. Students gain an understanding of the role of theory, the philosophical basis of the theories, the divergent methods utilized, and the utility of each perspective. COUN 523H is geared specifically to the needs of Human Resource professionals.

*3 semester hours*

COUNSELING 524

## **Strategies and Techniques of Counseling**

Building on basic listening skills this course focuses on developing strategies and interventions that promote therapeutic movement for the client. Techniques of the various theoretical orientations will be presented and practiced. Simulated role plays and videotaped sessions provide active opportunities to develop the skills. This course has significant out of class expectations. Prerequisites include completion of at least 9 credits and Counseling 505 and 523.

*3-4 semester hours*

COUNSELING 525

## **Appraisal Procedures for Counselors**

In this course students become familiar with a variety of standardized assessment instruments, learn how to evaluate them, select several tests that are appropriate for use in an area of professional responsibility related to a real or anticipated counseling situation, and interpret test results in a supervised setting. Prerequisites include Counseling 505, 522 and 523.

*3 semester hours*

COUNSELING 526

## **Addictions and Treatment**

This course is designed to provide a practical experience for counselors learning to work with alcohol and other drug abusers and other addictions. Covered in the course will be a survey of the various psychoactive drugs and behavioral addictions along with diagnosis and treatment modalities in working with persons with addictions, and those affected by persons with addictions. Prerequisites include Counseling: 505, 521 and 523 (524 is recommended for the Community concentration).

*3 semester hours*

COUNSELING 527

## **Foundations and Contextual Dimensions of Gerontological Counseling**

This foundation course introduces students to the history and philosophy of gerontological counseling. All services and professional issues are considered through the normative experiences of aging related to the social, psychological, physical, cultural, and spiritual changes occurring during the older adult years. A discussion of common impairments is also included. Foundation topics include settings, roles and functions, ethical and legal issues, professional organizations, and diversity issues. Contextual dimension topics include types of delivery systems, support networks, community care options, social service needs, and assessment strategies for working with older adults.

*3 semester hours*

COUNSELING 528

## **Gerontological Counseling Techniques and Methods**

This course presents studies related to common impairments for older persons like chronic illness, Alzheimer's disease, substance abuse, depression and suicide, sexual

dysfunction/alternatives, and problems with prescription medications are presented in detail. Counseling strategies shown to be effective with older adults, both from a developmental/wellness and impairment perspective, are included within a framework of gender and cultural considerations. Counseling strategies might include life review, family counseling, group work, art therapies, grief and loss counseling, wellness interventions, psycho-educational and social network interventions. Students are expected to practice via role plays the strategies reviewed in class.

*3 semester hours*

COUNSELING 529

## **Mid-Life Counseling**

This course focuses on the mid-life client who, historically, has been neglected in theory, practice and general concern of professionals in counseling and related fields. Special problems and needs of the mid-life person are explored in the context of the human growth and development process over the total life span. Through class experiences, students will develop counseling procedures appropriate for this age group and their specific issues.

*3 semester hours*

COUNSELING 531

## **Computer Applications in Counseling and Human Resources**

Hands-on experience with computer programs useful to counselors and human resource developers in a variety of work and study environments are presented in this course. Software samples relevant to a variety of counseling settings are studied and evaluated.

*2 semester hours*

COUNSELING 560

## **Human Development: A Lifespan Approach**

This course provides a survey of major theories and issues in the field of human development. Topics include the nature of human development; research methods in the field of human development; biological bases for human development; the social, emotional and cognitive changes that occur across the lifespan; and how human development affects, and is affected by, family life, peer relationships, schooling, gender, values, and culture.

*3 semester hours*

# Counseling

COUNSELING 566

## **Personality and Psychopathology**

This course can be used either as an elective or an alternative for those who do not have the pre-requisite undergraduate preparation for the program. The course provides perspective on personality development and the development of dysfunctional psychological conditions.

*3 semester hours*

COUNSELING 574

## **Practicum**

Students participate in an exploratory field experience in selected community, agency, collegiate, or corporate settings. Departmental permission is required. Specific coursework may also be required depending upon concentration or setting.

*1-3 semester hours*

COUNSELING 575

## **Internship**

In this course students participate in an intensive supervised field experience in selected clinical, collegiate, or corporate settings. For the Community Counseling concentration, prerequisites include departmental permission and the completion of 24 credits including Counseling 505, 510, 516, 521, 523, 524, & 560. For the Human Services concentration, prerequisites include departmental permission and the completion of 24 credits including Counseling 502X, 505, 510, 516, 521, 523, & 560. For the College Student Personnel and Human Resource Development concentrations, prerequisites include departmental permission and the completion of 24 credits including Counseling 505 or 505H, 521 or 521H, and 523 or 523H.

*1-6 semester hours*

COUNSELING 580D

## **Special Problems of Counseling**

These courses, used as electives, may cover specific counseling perspectives such as solution-focused or cognitive therapies, psychopharmacology or specific applications of counseling such as grief, crisis, trauma or employee assistance.

*1-6 semester hours*

COUNSELING 590

## **Master's Project**

This course is designed to assist the student in development of a scholarly masters project, which is the final product required for

completion of the Master's Degree in Counseling.

*1-3 semester hours*

COUNSELING 622

## **Group Work Processes and Skills**

A laboratory and seminar course in which students become actively involved in working with small groups. Emphasis in the supervised group and seminar sessions will be on the leader's role as a facilitator of individual growth within the group setting. Prerequisite: Counseling 505, 523, & 524 or departmental permission.

*3 semester hours*

COUNSELING 623

## **Counseling and Consultation Skills**

This course explores the role and implications of the consultative process in various settings: with co-workers, with individuals and groups, with organizations and institutions. Participants will have an opportunity to increase skills in the consultative process; to exchange experiences, problems and concepts in practice on consultation; and to increase the number of alternatives one may use in the consultative process. By experiencing and learning from an actual consulting assignment, each participant has an opportunity to be more aware of self and increase the congruence between personal and professional life.

*3 semester hours*

COUNSELING 624

## **Group Strategies and Techniques for Developing Human Potential**

Advanced treatment of the application of human relations skills and strategies in a workshop setting. Each participant contracts to develop specific skills in a minimum of one approach up to a maximum of six approaches from such areas as reality therapy, transactional analysis, psychodrama, gestalt, bio-energetics, Otto's human potential or other approaches.

Prerequisite: Permission of instructor.

*1-6 semester hours*

COUNSELING 627

## **Life Work Plan**

Upon student demand

This course provides opportunities to examine and share various career planning modules that can be used in a variety of settings. Participants will have the opportunity

to experience one model in particular: Life Work Planning. The Life Work Planning experience is divided into two sections; Phase I encourages greater client self-awareness through various exercises and group interaction; Phase II provided clients with a variety of proven decision and planning tools. With these tools, clients can clarify their goals, decisions and plans; test their present direction; seek new directions; look for alternatives; and move toward action and greater control. Life Work Planning links clients' present realities with personal growth. Throughout the experience, they work alone, or in a subgroup of four or five people. The exercises and tools can be used again throughout their lives to focus attention on their position in a world of change.

*3 semester hours*

COUNSELING 630

## **Clinical Skills for Mental Health Counselors**

The focus of this course is the skills necessary to work in a psychotherapeutic venue including treatment planning, report writing and diagnosis. The course covers description and diagnosis of the mental disorders as prescribed by the Diagnostic and Statistical Manual. Prerequisites include Counseling 505, 523, 510, 524, and 566. Ideally this course should be taken concurrently with the first semester of internship.

*3 semester hours*

COUNSELING 650

## **Organization and Administration of Mental Health Systems**

This course provides a comprehensive introduction to human service organizations through the perspective of managerial competencies necessary for success in the human services agencies, including human resources, supervision, managing finances, monitoring and evaluating programs and services, social advocacy and managing change. Prerequisites include Counseling 505, 510, 521, and 523.

*3 semester hours*

COUNSELING 680D

## **Advanced Seminar in Counseling**

These courses are designed to allow advanced students the opportunity to select topics for study which are both relevant to the counseling field and important to the students' professional development.

*1-6 semester hours*

## Counseling • Dental Hygiene

COUNSELING 690

### **Advanced Research Project**

A course designed to assist the student in development of a scholarly masters project, which is the final product required for completion of the Certificate of Advanced Graduate Study (CAGS) in Counseling.

*1-6 semester hours*

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## **Dental Hygiene**

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DENTAL HYGIENE 500

### **Leadership in Dental Hygiene**

This course focuses on the theories, concepts, and principles of leadership skills related to personal behavior, communication, organizational and leadership styles. This course explores the opportunity to develop leadership roles appropriate to the dental hygiene profession.

*3 lecture hours, 3 semester credits*

DENTAL HYGIENE 501

### **Grant and Contract Writing**

This course will provide the graduate students with an introduction to the process of grant application, award, post award management, types of grants and contracts, content and language of announcements for funding, and requirements of various funding agencies. The steps to writing a grant proposal for health-care funding from private, state, and federal funding sources will be covered.

DENTAL HYGIENE 502

### **Evidence Based Research**

This course is designed to prepare the student to utilize research as the foundation for clinical decision making. The practical application of evidence-based decision making to the clinical management of individual patients is explored.

DENTAL HYGIENE 503

### **Clinical and Didactic Educational Concepts**

This course will introduce the graduate student to a procedure for developing a competency-based curriculum. The student will learn the steps in developing a lecture, module of instruction, and a course. Cognitive, affective, and psychomotor learning theories are addressed along with clinical teaching methodologies.

*3 lecture hours, 3 semester credits*

DENTAL HYGIENE 504

### **Clinical/Laboratory Teaching**

This course will provide students with the practical knowledge and skills to function as a competent clinical/laboratory instructor. Psychomotor skill development and analysis, remediation of performance concerns, evaluation, and faculty calibration are areas stressed.

*1 lecture hour, 4 clinic/laboratory hours, 3 semester credits*

DENTAL HYGIENE 505

### **Didactic Student Teaching**

This course will provide students with the practical knowledge and skills to function as a competent didactic instructor. Cognitive skill development and analysis, evaluation strategies, and faculty calibration are areas stressed.

*1 lecture hour, 4 laboratory hours, 3 semester credits*

DENTAL HYGIENE 507

### **Dental Health Services Administration/Management**

This course is designed to familiarize the student with the administrative concepts necessary to effectively administer dental health facilities and departments. Emphasis is placed on leadership, decision making and problem solving skills. It examines political, social, and legal systems that affect dental hygiene administration and influence its role.

*3 lecture hours, 3 semester credits*

DENTAL HYGIENE 508

### **Curriculum Development and Management**

This course provides the student with the study and development of models for dental hygiene curriculum design and implementation. The development and utilization of competencies and the evidence based instruction is emphasized.

*3 lecture hours, 3 semester credits*

DENTAL HYGIENE 509

### **Dental Public Health**

This course is designed to prepare students for leadership roles in dental public health settings. Administration, grant writing, consumer advocacy, epidemiology, biostatistics, the assessment, planning, implementation, and evaluation stages of programs and alternative dental hygiene care is emphasized.

DENTAL HYGIENE 510

### **Foundations of Healthcare Management**

The focus of this course is the healthcare system in the U. S., specifically how its entities

work, how they interrelate and how it differs from healthcare systems in other countries with more government controlled systems.

DENTAL HYGIENE 511

### **Epidemiology**

This course will provide the graduate student with the skills necessary to study health states in populations and its applications in basic science, general clinical research, and public health. Students will critique the dental hygiene literature as it applies to the subject of epidemiology.

DENTAL HYGIENE 513

### **SEMINAR IN PUBLIC HEALTH ISSUES**

This course will explore current concepts and challenges facing dental healthcare delivery through the development of collaborations across healthcare disciplines, delivering culturally and linguistically competent healthcare, and evaluating current and proposed dental healthcare workforce models. Initiatives serving the purpose of guiding national health promotion and disease prevention to improve the dental health of the U.S. Population and informing the american public on health matters will be examined.

DENTAL HYGIENE 516

### **Concentrated Practicum**

This course provides the Graduate student with the opportunity to take an active role in the development of a practical experience at a site relevant to their specialized area of concentration. The student identifies a site and mentor to supervise the practicum prior to the start of the course. The practicum faculty advisor works closely with the student throughout the course providing strategies to help the student achieve a successful outcome.

*1 lecture hour, 6 laboratory/clinic hours, 3 semester credits*

DENTAL HYGIENE 520

### **Master's Thesis Preparation**

Original research in a chosen topic relating to the graduate student's area of specialization will be studied, conducted, written and presented.

*1 lecture hour, 8 laboratory/clinic hours, 4 semester credits*

DENTAL HYGIENE 521

### **Master's Thesis Extension**

*1 credit*

# Design Management

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## Design Management

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DESIGN MANAGEMENT 400

### Collaborative Design Studio I

Design Management is an inter-disciplinary field that combines various forms of design including graphic design and branding, interior design and architecture, industrial design, and fashion and textile design. Collaborative Design Studio I will begin to equip students with the skills they need to work with cross-functional teams. This is done through client-based design projects that originate from local Fortune 500 and other global organizations. Students will learn communication, team building, and leadership skills as they hone their design talents.

*2 semester credits*

DESIGN MANAGEMENT 401

### Collaborative Design Studio II

Building on the foundation formed in Collaborative Design Studio I, students will again be grouped in inter-disciplinary teams to complete an innovative, client-based design project. The project for this course will focus the students' attention on the triple bottom line: profitability, sustainability, and responsibility.

*2 semester credits*

DESIGN MANAGEMENT 500

### Collaborative Design Studio III

Collaborative Design Studio III will continue to equip students with the skills they need to work with cross-functional teams on real world, client-based assignments. Students will learn communication, team building, and leadership skills as they hone their design talents.

*2 semester credits*

DESIGN MANAGEMENT 501

### Collaborative Design Studio IV

Collaborative Design Studio IV will continue to equip students with the skills they need to work with cross-functional teams on real world, client-based assignments. Leadership skills will be given extra attention during the second year's teamwork.

*2 semester credits*

DESIGN MANAGEMENT 410

### Design Management I

Design Management is a multifaceted, organic discipline whose exact definition can differ between organizations and Design

Managers. In Design Management I, students will explore various definitions of Design Management with the goal of defining their own course of study. By reading and writing about relevant case studies, students will examine a wide variety of applications of design management. Students will be required to present their description of design management by the end of the term.

*3 semester credits*

DESIGN MANAGEMENT 411

### Design Management II

As the student's concept of design management deepens, they will begin to explore the implications that design management has on an organization. Design Management II will describe the six core principles of the program: Marketing, Leadership, Finance, Legal, Operations, and Strategy, as well as the triple bottom line: Profitability, Responsibility, and Sustainability. Students will learn the ripple effect their design decisions have on an organization as they broaden their understanding of the field of design management.

*3 semester credits*

DESIGN MANAGEMENT 510

### Design Management III

Students will continue to further their understanding of design management. Through relevant case studies, text readings, and lectures, students will develop a plan for the application of design management principles within their organization. The final project for this class includes an action plan for an organization where design management principles will make a meaningful impact on their triple bottom line.

*3 semester credits*

DESIGN MANAGEMENT 511

### Design Management/Thesis IV

Design Management/Thesis IV requires students to develop an idea that embraces and explores a particular aspect of design management. Students will work independently on a paper that broadens the design management field. This unique challenge demands that the students demonstrate an understanding of the six core principles of the program: Marketing, Leadership, Finance, Legal, Operations, and Strategy, while injecting their own interpretation of design management based on their experience, talent, and culture.

*3 semester credits*

DESIGN MANAGEMENT 598

### Internship/Co-op

Fairfield County and the surrounding tri-state area are rich in organizations in need of qualified design management interns. Through strategic partnerships and student initiative, internships will be established to give students first-hand experience as a design manager. Students will report on their experience and that report, coupled with his or her manager's evaluation, will form the basis for determining the student's grade. Internships are taken by domestic students; Co-ops are taken by international students.

*1 semester credit*

DESIGN MANAGEMENT 599

### Special Projects

Special projects and independent study give students the opportunity to explore specifics of design management as they relate to their own area of expertise. Students will be encouraged to seek out opportunities to gain practical experience in the design and design management fields. This course should include field, library, and institutional research on a specific aspect of design management. Student evaluation will be based on a report submitted by the student.

*2 semester credits*

MARKETING 600

### Marketing

This course explores the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual, organizational, and societal objectives. The underpinnings of marketing discipline will be taught through text, case studies, articles, and class discussion. Mastery of these principles will come through individual and group assignments to create marketing solutions for real-world products.

*3 semester credits*

MANAGEMENT 600

### Leadership & Management

This course will introduce students to the primary tenets of leadership and management. Successful organizations foster innovation and efficiency. Students will evaluate the dynamics related to realizing organizational progress through the effective and efficient use of talent, structure, culture, methods, and technology. In addition to the required textbooks, students will research industry jour-

## Design Management • Education

nals as a way to evaluate the application of leadership and management techniques in real settings across various industries.

*3 semester credits*

### ACCOUNTING 600

#### **Financial Accounting**

This course will provide managers with the skills necessary to read, interpret, and apply information about an organization's financial position. Managerial accounting and finance concepts will precede financial statement analysis. Topics covered include: how accounting data is generated in business operations, how financial statements are created, management of finance to maximize return on investment, and stakeholder equity. Students will participate in case work applying the principles presented in class.

*3 semester credits*

### BUSINESS LAW 600

#### **Legal Environment of Business & Ethics**

This course focuses on how the legal environment of business impacts business decisions with broad ethical, international, and critical thinking examples throughout. Knowledge of the legal aspects of running a business will enable the student to conduct business within the legal framework and understand the ethical dimension of business decisions. Topics include: Introduction to Business Ethics and the Judicial and Legislative Process; Litigation, Alternative Dispute Resolution, and the Administrative Process; Business Crimes, Torts, and Contracts; The Constitution and Government Regulation of Business; Business Organizations; Employment and Labor Laws; Consumer Protection and Environmental Regulation; and International Law and Ethical Conflicts.

*3 semester credits*

### INFORMATION SYSTEMS AND KNOWLEDGE MANAGEMENT 600

#### **Information Systems & Technology**

Information technology has become a key component for accomplishing strategic and operational goals in organizations today. As such, organizations expect their new employees to have a basic understanding of information technologies. To accomplish organizational goals and advance one's career path, one needs to understand and apply information technologies effectively, efficiently, and creatively. The purpose of this course is to provide an introduction to information

systems and technology and to familiarize students with the fundamental concepts and principles of information systems. The course is targeted for graduate students who have little or no background in information systems. Therefore, it focuses on breadth of coverage rather than depth in any specific area.

*3 semester credits*

### MANAGEMENT 652

#### **Small Business & Entrepreneurship**

A comprehensive review of the marketing, operational, financial, product, service, and business strategy and plans that must be mastered and developed as foundation for start-up of a small business or entrepreneurial enterprise. In addition, growth of existing business through intrapreneurship is also covered. Students will develop a comprehensive business plan for a business of their choice which is acceptable to the professor.

*3 semester credits*

### DESIGN MANAGEMENT 580X

#### **New Product Commercialization**

The objectives of this course are to understand and apply concepts and techniques of product commercialization. The course focuses on taking student-created product concepts and having student teams drive the concepts to become actual products. Product design, prototype creation, market analysis, and financial analysis all come together with the student team to create a viable product. If ideas are worthy, teams may work with the University's CTech IncUBator to actually commercialize their products. Students are strongly encouraged to find a sponsor to actually commercialize their product ideas.

*3 semester credits*

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## **Economics**

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### ECONOMICS 600

#### **Economics**

This is a course for managers in both micro and macro economics. Topics addressed will include the prevailing patterns of economic institutions, national income analysis, international trade, prices and production; economic development, market structure and consumer decision analysis, competition, monopoly and monetary policy issues. Prerequisites: Admission to graduate study.

*3 semester credits*

### ECONOMICS 710

#### **Managerial Economics**

Managerial economics deals with the application of economic theories to real-world business decisions. A course in managerial economics provides students with the fundamental analytical tools that can and should be used in marketing, finance, production, and strategic management. Managerial economic techniques seek to achieve the objectives of the business organization in the most efficient manner, while considering both explicit and implicit constraints on achieving the objectives. Some basic quantitative skills such as statistics and calculus are required. Prerequisites: ECON 600, MGMT 600, FIN 600 and completion of all core courses or concurrent registration in final core courses. This course may be taken as an elective with required Finance and Management concentration courses.

*3 semester credits*

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## **Education**

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*Note: Teacher Leadership courses are designated with the prefix of EDMM. Specific titles are listed with the programs of study in the chapter for graduate studies in the School of Education. Consult the division faculty for detailed course descriptions.*

### EDUCATION 348 C, M

#### **Directed Observation and Supervised Teaching in the Elementary or Middle School**

This is a full-time field experience in a selected elementary or middle school. This meets requirements of Connecticut's TEAM program. PRAXIS I must be passed. Department permission is required.

*6 semester hours*

### EDUCATION 392

#### **Directed Observation and Supervised Teaching in Secondary Schools**

This is a field experience in selected secondary schools. This meets requirements of Connecticut's TEAM program. Departmental permission is required. PRAXIS I must be passed.

*6 semester hours*

### EDUCATION 440

#### **Methods and Materials in Teaching Language Arts**

This course focuses on the teaching and learning of the English language arts with an emphasis on instructional planning and

# Education

assessment using current state and national standards.

**ED 440C** concentrates on the language arts processes and practices implemented in the elementary-level curriculum, grades K-6.  
2 semester hours

**ED 440M** concentrates on the language arts processes and practices for middle school settings, grades 4-8, with an emphasis on interdisciplinary connections.  
3 semester hours

**ED 440J** concentrates on the issues and pedagogy of teaching the English language arts and literature in secondary-level settings, grades 7-12.  
3 semester hours

**EDUCATION 441**

## **Methods and Materials in Teaching Mathematics**

This course deals with methods of teaching mathematics. Materials are examined for their use in diagnosis, remediation and enrichment.

**ED 441C** concentrates on the scope and sequence, as well as appropriate activities, for the elementary level.

**ED 441M** concentrates on the appropriate practices for middle school, grades 4-8, with an emphasis upon interdisciplinary connections.

**ED 441J** concentrates on the content and methodology of mathematics for secondary students.

**ED 441 C** — 2 semester hours

**ED 442 M, J** — 3 semester hours

**EDUCATION 442**

## **Methods and Materials in Teaching Social Studies**

This course assists students in developing competencies in unit planning, instructional strategies, and the utilization of diverse materials and technology for teaching the social studies. Students design courses of study that integrate state and national standards; contemporary thinking about the teaching of social studies is stressed.

**ED 442C** concentrates on the activities, planning, and materials for social studies in elementary classrooms.

**ED 442M** concentrates on the content, practices, and planning appropriate for the middle level, grades 4-8. Interdisciplinary possibilities are examined.

**ED 442J** concentrates upon appropriate con-

tent, planning, and practices for 7-12 classrooms.

**ED 442 C** — 2 semester hours

**ED 442 M, J** — 3 semester hours

**EDUCATION 443**

## **Methods and Materials in Teaching Science**

This course introduces teaching approaches, instructional materials, and contemporary thinking about science education.

**ED 443 C** concentrates upon the practices and materials of effective science for elementary level.

**ED 443 M** concentrates upon the appropriate content and practices for the middle grades, 4-8. Interdisciplinary possibilities are examined.

**ED 443J** concentrates upon the appropriate content and practices for the secondary science curriculum.

**ED 443 C** — 2 semester hours

**ED 443 M, J** — 3 semester hours

**EDUCATION 445**

## **Methods and Materials of Teaching Business**

This course focuses on various purposes of the business curriculum in a school setting. It examines the range of teaching strategies and materials for classroom practices.

3 semester hours

**EDUCATION 446**

## **Methods and Materials in Teaching a Foreign Language**

This course familiarizes the student with the major purposes of the study of foreign language in the schools. It introduces the strategies and classroom activities for effective teaching. It examines appropriate materials for teaching foreign languages.

3 semester hours

**EDUCATION 447**

## **Methods and Materials of Teaching English as a Second Language**

This course explores the language needs of children who are learning English as a second language. It reviews and explains effective methods and strategies for teaching such students. The most appropriate materials are identified and utilized.

3 semester hours

**EDUCATION 448**

## **Methods of Teaching Art in the Public Schools, Elementary**

This course focuses on the range of methods

appropriate to teaching art in elementary, middle and secondary levels. Demonstrations and hands-on practice are core experiences.

3 semester hours

**EDUCATION 449**

## **Materials and Techniques for Teaching Art in the Public Schools, Elementary**

This course focuses on art and craft media, techniques and procedures for the prospective art and classroom teacher which are presently offered within the art curriculum of public schools. These include drawing and painting, printmaking, silk screening, enameling and others depending upon the background and experience of individual students.

3 semester hours

**EDUCATION 450**

## **Field Experience**

This course is a structured observation in a public school. The goals of the course are to facilitate the students awareness of self, of school pupils, and of prospective teachers. The course is an elective for other majors. The number of semester hours taken should be determined with the student's advisor.

1-6 semester hours

**EDUCATION 500**

## **Research Techniques and Report Writing**

This is an introduction to the research process, to the understanding of published research, and to the application of research findings to education. The course prepares the student to write formal papers and research reports.

3 semester hours

**EDUCATION 502**

## **Philosophical Foundations of Modern Education**

This is an examination of basic philosophical problems which underlie the educational questions that confront society. The aim is to provide a foundation upon which a critical understanding of fundamental questions of modern culture and education can be developed.

3 semester hours

**EDUCATION 503**

## **Diverse Students: Differentiated Instruction**

This course focuses on pedagogy based on the philosophy that each student is a unique learner and that instruction should be provided that meets the needs of diverse stu-

## Education

dents. Methods for addressing the needs of students' diverse strengths, background, experiences, gender, linguistic, and learning styles will be presented. It is recommended that the course will be taken after completion of EDU 564: Education of Students with Exceptionalities.

*3 semester hours*

EDUCATION 504

### **Comparative and International Education**

This is a comparative study of educational policies and practices in selected countries throughout the world. Global problems like peace, social and economic justice, and environmental quality are examined with a view to promoting global awareness in American education.

*3 semester hours*

EDUCATION 505

### **Intercultural Relations: Teaching and Learning in Multicultural Environments**

This course presents an overview of theories about educational, social and cultural problems of minority culture students, about teacher perceptions and expectations, about parental involvement. The course also critically analyzes policies and practices of multicultural and bilingual education. The thrust of the course is to develop appropriate and non-biased methods of teaching all children.

*3 semester hours*

EDUCATION 509

### **Psychological Foundations In Education**

This is concerned with the work of educators in general and teachers in particular. Topics include student characteristics (personality, growth, and development, adjustment, etc.) motivation, learning, measurement and evaluation, objectives, and teaching methods.

*3 semester hours*

EDUCATION 511

### **Statutory Requirements**

This course addresses the topic required for Connecticut licensure in teaching, including topics in health and intergroup relations.

*1 semester hour*

EDUCATION 515

### **Clinical Experience—Internship Program**

In the first semester interns will work under supervision in a learning environment, providing a variety of paraprofessional services to the schools.

In the second semester the internship is designed to provide (1) a more in-depth per-

spective of teaching and learning through the development of a portfolio and (2) an opportunity to reflect on and document the impact of the internship experience.

*6 semester hours*

EDUCATION 530

### **Child Growth and Development**

This course is an investigation of child growth and development with emphasis on the implications for school-aged children. The needs, problems, and characteristics of children from infancy to adolescence are discussed. Social, emotional, cognitive physical and language developments are stressed.

*3 semester hours*

EDUCATION 536

### **Adolescent Literature**

This surveys books and periodicals emphasizing criteria for selection and evaluation, procedures for establishing a program of literature in the schools, and opportunities to explore the interpretation of literature in the classroom through drama, story telling, book reporting, and choral speaking. Education 536C is focused on children's literature. Education 536J concentrates on adolescent literature. Education 536M concentrates on a pre-adolescent literature.

EDUC 536C – 2 semester hours

EDUC 536M/J – 3 semester hours

EDUCATION 537

### **Middle Grades Interdisciplinary Teaching and Teams**

This course focuses on the developmental levels of the middle school student, appropriate instructional climates for middle grade classrooms, and interdisciplinary planning across subjects in English, History/Social Studies, Math, and Science.

*3 semester hours*

EDUCATION 540

### **American Culture and Education**

This course addresses cultural issues related to education. Topics include multicultural issues in America and the interpretation of demography in relation to schooling. The search for national identity and educational alternatives are explored.

*3 semester hours*

EDUCATION 541

### **Classroom Management in Teaching English as a Second Language**

This course focuses on classroom manage-

ment as an effective tool for a positive learning environment. Planning, implementing, and maintaining management procedures are discussed.

*2 semester hours*

EDUCATION 542

### **Theory and Methods of Teaching English as a Second Language**

This course addresses the foundations of second language learning theory, research, and discourse in educational settings. It also focuses on strategies for teaching dual language instruction with emphasis on a culturally responsive environment and on legal issues as they apply to schooling for English language learners.

*3 semester hours*

EDUCATION 543

### **Second Language Acquisition**

This course provides an overview of the major theories of first and second language acquisition. It applies these theories to classroom pedagogy and examines the influences of parents, siblings, and peers, as well as aspects of formal and informal education. It also examines the influence of region, culture, class, and gender on language acquisition; legal and ethical issues relative to language competency are addressed.

*3 semester hours*

EDUCATION 545

### **English Language and Literature for Teachers**

The purpose of this course is to give prospective teachers of English as a Second Language (ESL) a rich knowledge of literature with potential classroom applications for multicultural settings. Selection and analysis of language processes and literature for elementary and secondary-level classrooms are included.

*3 semester hours*

EDUCATION 546

### **Linguistics for Teachers**

This course acquaints teachers with the major analytical frameworks in linguistics. It surveys the discipline of linguistics, the study of human languages, contrastive features, and language systems.

*3 semester hours*

EDUCATION 558

### **Evaluation of Instructional Outcomes**

This course gives students an orientation to the topics, issues, and concepts in the field of

# Education

educational testing and measurement. Topics include methods for evaluating instructional programs, types of instruments for collecting data, and a variety of standardized, criterion-referenced, and performance-based assessments. The construction of teacher-made tests and the interpretation of different types of test scores are included.

*3 semester hours*

EDUCATION 560M

## **Human Growth and Development, Middle**

This course provides an opportunity for the study of the subject matter of human development, with a concentration upon the uniqueness of the adolescent period. Theoretical models and methods of researching human growth and development including cognition, physical, social, emotional and moral development will be studied. Genetic and environmental influences of human development will be discussed. Implications for classroom instruction in the middle grades will be explored.

*3 semester hours*

EDUCATION 564

## **Education of the Exceptional Student**

The focus of this course is placed upon the instructional methods and materials for exceptional students. General management techniques and administrative procedures are considered in light of the student's special needs in order to identify and work effectively with the major categories of exceptionality, including the learning disabled, the handicapped, and the gifted, etc. Requirements of the 94-142 law are examined.

*3 semester hours*

EDUCATION 565

## **Contemporary Problems in Education I**

This is a study of foundations, issues and contemporary trends in education with their application to teaching in the schools. An effort will be made to encourage teachers to develop an understanding of their own philosophy of education and how it affects their teaching.

*3 semester hours*

EDUCATION 566

## **Contemporary Problems in Education II**

This independent study fulfills the Final Degree Option for the Master's degree. Students pursue an individually planned project under advisement of a faculty member. Extensive reading supports the project. May be taken as an extension of ED 500 or ED 565.

*3-6 semester hours*

EDUCATION 571

## **Diagnosis and Intervention of Reading and Language Arts Difficulties**

This course examines the range of problems that cause students difficulties in literacy processes. It examines assessment instruments and strategies for intervention and instruction in Reading and Language Arts.

*3 semester hours*

EDUCATION 572

## **Advanced Diagnosis of Reading and Language Arts Difficulties**

This course is for students interested in working with learners experiencing profound difficulty in reading, writing, and other literacy processes. Students learn strategies for assessing students referred for specific literacy instruction. Both individual and group diagnostic assessments are used. Students learn how to interpret testing results and make recommendations for improvement. Prerequisite: EDUC 571

*2 semester hours*

EDUCATION 573

## **Early Literacy Instruction**

This course concentrates on the theories, instructional applications, and materials for the teaching, learning, and assessment of literacy processes in early childhood and up to grade 2. Topics include emergent literacy, phonological awareness, and phonic knowledge and instruction.

*1 semester hour*

EDUCATION 574

## **Developmental Reading in the Elementary School**

This course focuses on the theories, instructional applications, and materials for the teaching, learning, and assessment of literacy processes in elementary classrooms. Topics include strategies in word recognition, vocabulary development, and comprehension. The developmental needs of beginning readers are emphasized.

*3 semester hours*

EDUCATION 575

## **Reading and Writing in the Content Areas**

This course focuses on the teaching and learning of comprehension and composing processes and strategies for content area disciplines. Critical reading and study strategies for expository text materials are emphasized.

*3 semester hours*

EDUC 575M concentrates on appropriate materials, strategies, and assessments for reading and writing in middle grade settings, 4-8. EDUC 575J concentrates on the comprehension and composing processes of students in secondary-level settings, grades 7-12.

*3 semester hours*

EDUCATION 576

## **Developmental Reading in Middle Grade Classrooms**

This course focuses on the theories, instructional applications, and materials for the teaching, learning, and assessment of reading and related literacy processes in middle grade (4-8) classrooms.

*3 semester hours*

EDUCATION 580C

## **Special Problems in Elementary Education**

This is intended for students interested in independent study or research of a selected topic or problem in consultation with a faculty member. By arrangement. Faculty permission required.

*1-6 semester hours*

EDUCATION 580J

## **Special Problems in Secondary Education**

This is intended for students interested in independent study or research of a selected topic or problem in consulting with a faculty member. By arrangement. Faculty permission required.

*1-6 semester hours*

EDUCATION 580L

## **Special Problems in Behavioral Science Research and Computer Applications**

This course is designed to enhance the efficiency and scope of one's research through the development of specific competencies needed for computer processing. Students will be exposed to computer-assisted instruction (C.A.I.) and computer managed instruction (C.M.I.), and will develop projects that focus on computer applications. By arrangement. Lab fee required.

*1-6 semester hours*

EDUCATION 590

## **Computer Literacy**

This is designed to provide the student with hands-on experience in the use and application. The student will have the opportunity to evaluate existing course work and its application as well as the writing of elementary programs in Logo and Basic. Lab fee required.

*1-3 semester hours*

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EDUCATION 591

### **Software Evaluation**

This is designed to have students develop software evaluation criteria for the purpose of evaluating published computer programs. The student will have an opportunity to review educational programs.

*1-3 semester hours*

EDUCATION 592

### **Technology Literacy for Educators**

This course is an introductory to expose students to a variety of technologies used by and with persons with exceptionalities. Students will gain hands-on skills in designing technology-based instructional materials for students. A focus on Universal Design for Learning is the core of this course with a goal of providing students with the ability to adapt technology, instruction, and assessment to meet a range of students needs.

*3 semester hours*

EDUCATION 595

### **Thesis Research — Masters Level**

This is a culminating experience option at the Master's level for Education students.

*2-6 semester hours*

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## **Educational Leadership**

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EDUCATIONAL LEADERSHIP 551

### **Curriculum Development and Implementation**

This is a study and development of models for curriculum design and implementation at all levels of schooling. Emphasis is placed on current research and practice relevant to curriculum design and the planning and monitoring of curriculum plans in educational settings. Such topics as: curriculum assumptions, goals and objectives, knowledge and content, curriculum evaluation, implementation and staff development strategies are examined.

*3 semester hours*

EDUCATIONAL LEADERSHIP 564

### **Special Education for Administration**

This course builds on the foundation of ED 564, the emphasis is on the administrative aspects of Special Education programs for schools.

*3 semester hours*

EDUCATIONAL LEADERSHIP 601

### **Contemporary Educational Problems**

This course will focus upon contemporary society and changing policy issues that confront managers and leaders of educational

thought throughout the 21st Century. Seminal issues such as the impact of political forces upon federal, state, and local educational policies will be considered. Labor relations will be analyzed. Empowerment of teachers will be examined.

*3 semester hours*

EDUCATIONAL LEADERSHIP 611A

### **Organization, Administration, and Supervision of Reading and Language Arts Programs**

This course focuses on the role of the Reading and Language Arts Consultant as an educational leader in schools and school districts and focuses on issues of organization, administration, and supervision of reading and language arts programs. Note: Students enrolled in this course must also concurrently enroll in EDLD 611 Administration: Organizing, and Staffing Educational Institutions. While EDLD 611 focuses on the broader issues of educational leadership in schools, EDLD 611A specifically focuses on reading and language arts programs and personnel.

*1 semester hour*

EDUCATIONAL LEADERSHIP 613

### **Leadership: Influencing People to Achieve Organizational Objectives**

This is an investigation of concepts, research findings, and practices focusing on the development and change of educational organizations in relation to relevant goals and objectives. Emphasis is placed on such areas as leadership theory and behavior, organizational climate, human relations and communications within the organization, and change strategies. Theoretical concepts of leadership are integrated along with practical applications.

*3 semester hours*

EDUCATIONAL LEADERSHIP 618

### **Public School Finance**

This is a study of educational fiscal control including: budget preparation and presentation, accounting procedures, tax structures, analyses of costs, comparative data and auditing. Includes federal, state and local phases of support of educational systems. Special emphasis is given to New York and Connecticut fiscal patterns.

*3 semester hours*

EDUCATIONAL LEADERSHIP 619

### **Public School Law**

This is a study of the legal basis for public education in the United States; a study of state

and federal statutes providing for education. An examination is made of statutes, court decisions, and policies and practices arising out of these factors. The legal status of boards, teachers, administrators, pupils and parents is examined with special emphasis on New York and Connecticut.

*3 semester hours*

EDUCATIONAL LEADERSHIP 621

### **Evaluation of School Effectiveness**

This course examines the various ways to evaluate the effectiveness of a school's performance: student achievement, faculty performance, faculty morale, provision for diverse student needs and development of student emotional growth. The course examines how data can and should affect instructional issues.

*3 semester hours*

EDUCATIONAL LEADERSHIP 652

### **Supervision: The Evaluation and Professional Development of Educators**

This is a study of concepts and strategies focusing on the evaluation of teachers and other educators for purposes of performance improvement and quality assurance. Emphasis will be placed on research findings, current practices, and the achievement of competency related to classroom observation and evaluation, the planning and implementation of professional development, and the creation of organizational climate and human relationships conducive to effective evaluation and professional growth of educators.

*3 semester hours*

EDUCATIONAL LEADERSHIP 680A

### **Independent Study in Educational Management.**

Offered by arrangement.

*1-6 semester hours*

EDUCATIONAL LEADERSHIP 681A

### **Internship in Educational Management**

A cooperatively guided administrative experience in a school system. Pre-requisite: Completion of major portion of the requirements for the Sixth Year Professional Diploma and permission of major advisor.

*3 semester hours*

EDUCATIONAL LEADERSHIP 682A

### **Special Topics in the Management of Educational Institutions**

Special department offerings including workshops, conferences, institutes focusing on

## Educational Leadership • Electrical Engineering

new developments in the field.  
*1-6 semester hours*

EDUCATIONAL LEADERSHIP 683

### **Internship for the Reading and Language Arts Consultant**

This course is a cooperatively guided administrative experience in the area of literacy education for those desiring to be certified as Reading and Language Arts Consultants. The internship includes a series of practicum experiences in a variety of school settings and includes research in the area of literacy education. Students gain practical field based experience through a range of tasks and situations characteristic of the position of the Reading and Language Arts Consultant in school settings.

*6 semester hours*

EDUCATIONAL LEADERSHIP 800D

### **Continuing Doctoral Seminar**

The seminar meets periodically during the academic year and for two full weeks each summer, for three consecutive summers. It provides opportunities for students to work with scholars and leaders from a variety of disciplines to broaden perspectives on educational leadership and to develop an intellectual style for dealing with educational problems.

*6 semester hours per year*

EDUCATIONAL LEADERSHIP 801

### **Educational Program Development**

Emerging trends, concepts and practices in the planning, design, and implementation of education programs intended to meet the individual and group needs of learners in a changing society are reinvestigated. Emphasis is placed on the roles and responsibilities of leaders in such processes as school/community educational goal setting, needs analysis, systematic program design, supervision and staff development. Students will focus on the application of new knowledge to the investigation and solution of program development in the field.

*6 semester hours*

EDUCATIONAL LEADERSHIP 804

### **Constitutional, Legal, and Political Issues Confronting Educational Leaders**

Legal questions relating to personnel, students, community, religion, finance, school property, teacher organizations, equality of opportunity and other legal and political is-

ssues with which the educational leader must be familiar in order to be effective in decision-making and organizational development are investigated. Emphasis is placed on "landmark" judicial decisions, recent statutory developments, constitutional background. Students will read, analyze, and interpret significant Supreme Court decisions regarding educational matters as well as pertinent lower federal and state court decisions. The principal of "non judicial" remedies will be explored and the appeals process will be examined in detail.

*6 semester hours*

EDUCATIONAL LEADERSHIP 806 A & B

### **Quantitative Analysis and Evaluation Strategies**

This course considers current techniques for designing, implementing and analyzing projects in education and typical models for facilitating decision-making. The elements of personnel and program assessment within the contemporary educational system are included. Strategies focusing upon experiential learning and community contact are featured, and the student will be exposed to collection and analysis of real data and related computer simulation activities. Statistical and evaluative investigations are emphasized which are both fundamental and sufficiently sophisticated for advanced decision-making and leadership. This course is required.

*6 semester hours*

EDUCATIONAL LEADERSHIP 807

### **Management of Educational Institutions (K-12)**

Participants in this course will investigate the planning and finance functions relative to the management of educational institutions. The planning component, the relationship between planning and institutional decision-making, and problems of implementing planning activities in educational contexts are considered. Finance is addressed through the treatment of budget preparation and presentation, accounting procedures, tax structures, and the role of local, state, and federal governments in support of educational system.

*6 semester hours*

EDUCATIONAL LEADERSHIP 808

### **Human Relations, Communication, and Decision Making**

This course will provide educational leaders with the necessary skills and knowledge to maximize the human resources within an institution. It will develop in participants in-

creased personal awareness, greater sensitivity to others, effective communications and appropriate strategies for change and decision making.

*6 semester hours*

EDUCATIONAL LEADERSHIP 810

### **Computer Application in Educational Leadership**

This course covers creation of learning objects, including text, raster/vector graphics, animation, slideshows, conferencing components, and video for instructional Webs. Use of digital image capture equipment, including digital cameras, camcorders, and scanners. Also covers basic HTML, PDF and OCR. Final project will be integration of elements into an instructional Web.

*6 semester hours*

EDUCATIONAL LEADERSHIP 845

### **Dissertation Preparation Seminar**

During the third year of the program, students participate in seminars which focus on the selection and development of a dissertation proposal. Students are ordinarily expected to complete the major portion of their work on the dissertation proposal prior to the conclusion of the formal part of the program. This course is required.

*3 semester hours each term (Fall & Spring), 6 semester hours final summer*

EDUCATIONAL LEADERSHIP 850

### **Dissertation Research and Advisement**

Individual research and advisement relative to a student's dissertation topic is the "sine qua non" of this course. Doctoral candidates are required to register for Education Management 850 continuously until their dissertations have received final approval. Prerequisite: Successful completion of Comprehensive Examination.

*0 semester hours*

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## Electrical Engineering

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ELECTRICAL ENGINEERING 404

### **Digital VLSI**

The objective of this course is to teach students the CMOS transistor design in VLSI circuits. (CMOS stands for complementary metal oxide semiconductor.) Supported by CAD tools, students will learn gate level design, IC design, fabrication, and layout of digital CMOS integrated circuits. With these skills,

# Electrical Engineering

students will also be able to interact with integrated circuit fabrication process engineers after completing this course.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 405

## Statistics for Engineers

From elements of probability, probability distributions and descriptive statistics to hypothesis testing, confidence intervals, linear regression and correlation, analysis of variance and engineering applications to include quality control.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 406 (ELEG 406/CPSC 406)

## Soft Computing I

Modeling and solving engineering problems using computational methods. Topics include exact (provable) methods (linear and convex programming) and fast methods (heuristic search, genetic algorithm, neural networks, etc.).

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 410 (ELEG 410/BMEG 410)

## Bio Sensors

This course will provide an interview of biosensors, including their use in Pharmaceutical research, diagnostic testing, and policing the environment. Topics include the sensitivity, resolution, selectivity, dynamic range, and noise of biosensors. Other topics covered include transducer phenomenology, biosensor structure, and sensor performance.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 413 (ELEG 413/CPSC 413)

## Bioinformatics

The course covers algorithmic aspects of modern DNA and protein analysis. Topics include: (i) Reviews of DNA, RNA and Proteins, (ii) Genome rearrangements, (iii) Sequence Alignment and fast algorithms (BLAST), (iv) Genome expressions and DNA-microarray, (v) Phylogenetic trees, (vi) Protein docking and drug discovery, etc.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 415

## Fiber Optics

Communication via light waves over fiber optics cables. Analysis of light emission and light detection. Absorption loss. Optical devices, connectors, splices and Local Area Networks (LANs). Pre-requisite: Physics 112 or equivalent.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 416

## Fiber Optics Lab

Hands on experience with fiber optic hardware. Fiber properties, sources, detectors, splices, connectors. Design and test fiber optic transmission and receiver circuits for both analog and digital transmission. Pre-requisite: Electrical Engineering 415.

*3 semester hours*

ELECTRICAL ENGINEERING 417

## Modern Electronics

See Electrical Engineering 348.

*3 semester hours*

ELECTRICAL ENGINEERING 428 (ELEG 428/BMEG 428)

## Wireless Communications

Evolution of Mobile Radio Communications to cell phones and personal communications: 2nd and 3rd and 4th generation. Concepts include cell fundamentals, path loss, fading, ghosts, modulation techniques, equalization, speech coding and networks.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 430

## Satellite/Wireless communication Systems

Detailing concepts and calculations from the entire field is enough to permit the kinds of analysis needed for major systems planning decisions. This course covers channel capacity, picture quality, signal to noise ratio, bit error rate, earth station antenna size and offers new materials on orbital mechanics and geometry. Pre-requisite: Electrical Engineering 441 or equivalent.

*3 semester hours*

ELECTRICAL ENGINEERING 431

## Fields and Waves

Solutions of static electric and magnetic fields are derived from Maxwell's equations and Gauss's law. Approximation, including multi-pole modelling, are used where exact solutions to theory do not exist. Also, the computer is used to solve these problems exactly without approximations. The course also introduces time varying fields and their link to the creation and propagation of radiation.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 437

## Microwaves

Passive and Active elements for the generation, modulation, amplification and reception of microwaves. Radar and other microwaves

systems. Pre-requisite: Field Theory.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 439

## Radar Theory and Simulation

Radar Fundamentals, Radar Cross Section, Types of Radars, Radar Detection, Waveform Analysis, SNR, Compression and Wave Propagation, Target Indicator and Tracking. The course will include extensive use of MATLAB for programming and simulation.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 440

## Distribution Power System Design

A comprehensive study of modeling of the distribution of power system components and planning, including load characteristics, application of power transformers, design of transmission lines, distribution sub-stations, primary systems and secondary systems, voltage drop and power loss calculations, application of capacitors, harmonics on distribution systems, voltage regulation, fault calculation and protection.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 441

## RF Communications

Spectral analysis; modulation and demodulation system analysis, including AM, FM, pulse modulation and transmission of digital information. Signal design and system considerations. Pre-requisite: Electrical Engineering 234.

*3 semester hours*

ELECTRICAL ENGINEERING 442

## Digital Communications

Detection of noise in thermal noise. Digital sequences. Optimal filtering and statistical decision theory. Optimum receiver design criteria. Performance, configuration and trade-offs. Pre-requisite: Electrical Engineering 441.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 443 (ELEG 443/BMEG 443)

## Digital Signal Processing

The FFT Spectral Analysis, Filtering in the presence of noise. Correlation. Introduction to stochastic signal processing. Computer projects. Pre-requisite: Electrical Engineering 234 or equivalent.

*3 lecture hours; 3 semester hours*

# Electrical Engineering

ELECTRICAL ENGINEERING 444

## Power Electronics

Application of power diodes and power transistors in rectifier arrangements and voltage regulators. Properties and application in power converters, inverters and motor drives. Pre-requisite: Electrical Engineering 348.

*3 lecture hours, 3 semester hours*

ELECTRICAL ENGINEERING 445

## DC/AC Motor Drives

Application to control speed and efficiency of motors using conventional thyristors control as well as modern variable frequency drives.

*3 lecture hours, 3 semester hours*

ELECTRICAL ENGINEERING 446 (ELEG 446/BMEG 446)

## MEMS (Micro-Electro-Mechanical Systems)

Basic micro fabrication techniques, MEMS materials and their properties, MEMS device design and simulation, MEMS packaging and assembly, signal testing and MEMS reliability analysis. MEMS industrial applications in various areas will also be discussed. Students used ANSYS FEM software to design and simulate their behavior.

*3 lecture hours, 3 semester hours*

ELECTRICAL ENGINEERING 447

## Semiconductors

Crystal fabrication: MBE, MOCVD, LEC, Bridge Mann. Study material and electronic properties of single crystal Si, poly, a-Si, GaAs, GaN, SiC, Ge and II-VI compounds. Transport properties: Hall Peltier, resistivity, mobility. Analysis of capacitance and I/V data for pn, pin, schottky and hetero-junction devices. Pre-requisite: Mathematics 110.

*3 lecture hours, 3 semester hours*

ELECTRICAL ENGINEERING 448

## Microelectronic Fabrication

This class covers basic microfabrication processes for semiconductor and VLSI fabrication, including photolithography, plasma and reactive ion etching, ion implantation, diffusion, oxidation, evaporation, vapor phase epitaxial growth, sputtering, and CVD. Advanced processing topics such as next generation lithography, MBE, and metal organic CVD are also introduced. The physics and chemistry of each process are introduced along with descriptions of the equipment used for the manufacture of integrated circuits. The integration of microfabrication process into CMOS, bipolar, and MEMS tech-

nologies are also discussed. The purpose of this course is to provide students with technical background and knowledge in silicon microelectronic fabrication process. Upon finishing this course, students will be familiar with the basic semiconductor and VLSI microfabrication processes.

*3 lecture hours, 3 semester hours*

ELECTRICAL ENGINEERING 449

## Introduction to Wireless Sensor Networks

In recent years, tiny computing devices equipped with low-power radios and sensors—made possible due to advances in micro-electronics and radio technologies—have obliterated the wall between the physical world and the cyber world, spawning a virtually unlimited number of new applications—some of them beyond our wildest imaginations. Successful design of these massively distributed wireless sensor networks requires a synergistic combination of multiple aspects: from the physical layer to decision algorithms and more. This course will introduce the students to the application areas, various challenges commonly faced in this application, state-of-the-art solution techniques and fundamental those have emerged in the recent years.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 451

## Introduction to Nanotechnology

Nanotechnology is the science and engineering involved in the design, synthesis, characterization and application of materials and devices with the size in nanometer (10-9m) scale. As a newly emerged exciting high-technology, it has attracted intensive interest and heavy investments around the world. Nanotechnology is a general-purpose technology which will have significant impact on almost all industries and all areas of society. It can offer better built, longer lasting, cleanser, safer and smarter products for home, communications, medicine, transportation, agriculture and many other fields. This course will cover basic concepts in nanoscience and nanotechnology.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 453

## Pattern Recognition

Operation and Design of systems that recognize patterns in data, based primarily on statistical and neural network approaches. Topics include Bayesian decision theory,

Parametric likelihood estimation, Nonparametric techniques, Linear discriminant functions and Neural Networks.

ELECTRICAL ENGINEERING 454

## Introduction to Audio Signal Processing

To introduce the fundamentals of speech processing and related applications. Course covers speech enhancement, speech coding, and speech recognition.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 456

## Adaptive Signal Processing

This course introduces students to the field of adaptive signal processing as well as several practical aspects of adaptive systems. This course provides an in-depth analysis of various adaptation algorithms such as least mean square adaptive filters, recursive least squares algorithms, and Kalman filters etc. The subject learning is enhanced through experimentation of adaptation techniques using Matlab and/or Labview projects centered on applications such as adaptive noise/interference cancellation, signal estimation/detection, and system identification etc.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 458 (ELEG 458/CPEG 458)

## Analog VLSI

Modeling, design and analysis of analog VLSI circuits. CMOS processing and layout, current mirrors, Opamp, comparators, S/H voltage references, switched-capacitor circuits, data converters, filters and PLLs. Students design analog VLSI layouts, extract the netlists and simulate the circuit behavior. Transistors sizing will also be discussed. EDA tools PSPICE, Mentors Graphics are used.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 459

## Audio Processing Lab

Introduction to TMS320C55x Digital signal Processor, Audio Signal Processing, Basic Principles of Audio Coding, Speech Enhancement Techniques, Quantization of Audio signals, Calculating LPC coefficient using C55x Intrinsic, Matlab Implementations of noise Reduction (NR), Mixed C55x Assembly and Intrinsic Implementations of Voice Activity Detection (VAD), Combining AEC with NR, Voice over Internet Protocol Applications, Overview of CELP Vocoders.

*3 lecture hours; 3 semester hours*

# Electrical Engineering

ELECTRICAL ENGINEERING 460

## Controls

Analysis of steady state and transient response of control systems. Laplace transforms methods. Transfer functions. Stability criteria. Nyquist, Bode and root locus methods. System stabilization. System Design.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 461

## Controls Lab

Laboratory study of feedback control systems with experiments analyzing different types of plants, transducers and control techniques; emphasis on real-time computer control.

*3 lab hours; 3 semester hours*

ELECTRICAL ENGINEERING 462

## Advanced Controls

This is a graduate level course and aims to introduce the analysis of nonlinear system. The course will cover: the state space description of nonlinear system; the phase portrait analysis of the second order system; stability analysis of the nonlinear system based on linearization method; the Lyapunov stability theory, etc.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 463

## Industrial Controls

This course covers the basics of Industrial Controls, including but not limited to relay control, ladders, counters, timers, switches, and all electrical components necessary to program the control of a large machine.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 464

## PLC's (Programmable Logic Controls)

This course will start with the basics of Boolean Algebra; it will cite the differences between PLC control and relay control and full automation of major machines and appliances; the differences in these controls will show how hard relay control is to implement and how flexible PLC control actually is; many different math functions will be analyzed and implemented in the theoretical construction of fully functioning PLC.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 466

## Adaptive Controls

Adaptive Controls provides a graduate level introduction to the basic concepts, techniques, and the state-of-the-art of adaptive

control systems. Upon completion of the course, students are expected to be able to conduct design, research, and development in the field. The course covers real time system identification algorithms, model reference adaptive control, pole assignment adaptive control, self-tuning and gain scheduling control systems, stochastic adaptive control, model-predictive control, and robustness issues of adaptive control systems. Prerequisites: Digital Control System (or equivalent)

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 479

## Solar Energy and Solar Cells

This course offers a review of renewable energy (solar, winds, and tides) versus bio-energy (coal, oil, natural gas). The concept of light as electromagnetic radiation and pure energy as well as the concepts of converting sunlight into thermal energy will be discussed. Students will learn the semiconductor and electronic properties of solar cells, used to convert light into electricity. Secondary solar energy sources include solar Hydrogen and concentrator technology.

*3 semester hours*

ELECTRICAL ENGINEERING 481

## Analog Electronics Lab

With a set of 6 experiments and simulating them using P-Spice, the goal of this course is to teach the concepts from the theory of analog electronics. The user must have solid understanding of the basic electronics and circuit theory aka Network Analysis. Prerequisite: Electrical Engineering 348, 234 or equivalents.

*3 semester hours*

ELECTRICAL ENGINEERING 482

## Analog Integrated Circuit Design

Do a complete analysis of the 741 op-amp, including bandwidth, gain analysis, slew rate, power efficiency and I/O impedances. Analyze ROM, Ram, TTL, ECL, CMOS and more modern logic structures including Fanout, noise margin, latching, contention, logic and delay response. Pre-requisite: Electrical Engineering 348.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 483 (ELEG 483/MEEG 483)

## Digital Integrated Circuit Design

Several integrated circuit architectures are analyzed at the transmitter level to find key parameters by hand analysis as well as com-

puter simulation: rise time, fall time, noise margins, logic state, hysteresis/memory, fanout, and power dissipation. Analysis includes an analysis of the major logic families: TTL, CMOS, NMOS, ECL, PECL, differential logic.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 490

## Alternative Energy Technologies

This is a graduate level course and aims to introduce the alternative energy technologies in photovoltaic cells (PV) and fuel cells. It will cover: the physics, energy conversion efficiency, and challenges in PV cells, the principles, the stack and system design in fuel cells.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 500

## Graduate Co-op/Internship in Electrical Engineering

By arrangement.

*1-3 semester hours*

ELECTRICAL ENGINEERING 503 (ELEG 503/MEEG 503)

## Electronics Cooling

This course is designed to help students understand the thermal challenges and demands of the electronics field. Fundamentals and physics of thermodynamics, heat transfer and fluid mechanics will be introduced and shown how to apply them to the design and testing of electronic hardware. The thermal characteristics and thermal failure modes of electronic components, and reliability prediction techniques will be reviewed. Numerical simulation and commercial CFD packages will be introduced for thermal analysis. Students will have a good understanding of the heat transfer and fluid mechanics principles affecting proper thermal management of electronic components and develop skills to identify potential thermal design problems and develop reliable, cost-effective solutions.

*3 semester hours*

ELECTRICAL ENGINEERING 510

## Medical Machines

Electrical safety is studied by full analysis of grounding and modeling of the human body under various electric shock conditions. The ECG machine (for measuring heart performance) is analyzed as both an analog and a digital machine, with emphasis on cleaning up signal problems and extending the analy-

# Electrical Engineering

sis of the data recorded. Other instruments that are analyzed include the blood sugar tester, the hospital thermistor, the lung pressure machine, the anesthesia vaporizer, the pulse oximeter and various cardiac output devices. Discussion made about the minimum alveolar concentration (MAC) as it applies to anesthesia. Discussion is also made about modern hearing aids and advances in eye replacement via electrical means. Prerequisite: Electrical Engineering 348, 234 or equivalent.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 542

## **Advanced DSP (digital signal processing)**

(1)review briefly the concepts of DSP (E443), including digital filter design and windowing (2) Carry on with new topics in Adaptive Filters, Wiener Filters, Kalman filters, power spectrum and related topics, statistical signal processing, and stochastic processes.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 543 (ELEG 543/BMEG 543)

## **Digital Signal Processing Lab**

Centered on a set of experiments for the ADSP21061 and ADS21065L, the goal of this course is to teach how to program the ADSP21061 and ADS21065L using visual DSP++ and MATLAB and illustrate concepts from theory of digital signal processing. The user must have solid understanding of DSP algorithms as well as an appreciation of basic computer architecture concepts. Prerequisite: Electrical Engineering 443 or equivalent.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 544

## **Wavelets and Filter Banks**

This course is offered to provide students with the basic understanding of the wavelet theory along with multi-resolution signal processing tools, which can be employed effectively to solve practical signal processing and analysis problems. The first half of the course introduces wavelet transforms from an engineering point of view. The topics covered include short time Fourier transform, continuous wavelet transform, and discrete wavelet transform and filter banks. The second half of the course presents a number of interesting applications of wavelets based advanced signal processing techniques such as filter banks, multi-rate signal processing, wavelet packets and lifting algorithms in areas of image compression, signal de-noising,

signal estimation, signal enhancements, and transient detection etc. Prerequisites: Basic Digital Signal Processing Course.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 546 (ELEG 546/MEEG 546)

## **Biomedical and Biometric Signal Processing**

The course teaches all of the basics of image processing as applied to biometrics analysis and medical imaging.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 548 (ELEG 548/CPEG 548)

## **Low Power VLSI Circuit Design**

With the rapid development of mobile computing, low power VLSI design has become a very important issue in the VLSI industry. A variety of low-power design methods are employed to reduce power dissipation of VLSI chips. This course is designed to cover low-power design methodologies at various design levels (from system level to transistor level). The basic low-power design strategies will be introduced in the class. Students will use the learned knowledge to design low-power VLSI circuits. Upon completion of this course, students will be able to analyze the power consumption of VLSI circuits, and design low-power VLSI circuits using various strategies at different design levels. The major target is to design VLSI chips used for battery-powered systems and high-performance circuits not exceeding power limits.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 549

## **VLSI Testing**

As VLSI continues to grow in its complexity, VLSI testing and design-for-testability are becoming more and more important issues. This course will cover VLSI testing techniques such as VLSI fault modeling (stuck-at-fault), automatic test generation, memory testing, design for testability (DFT), etc. VLSI scan testing and built-in self-test (BIST) will also be covered. Student will learn various VLSI testing strategies and how to design a testable VLSI circuit.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 550

## **VLSI: Digital System Design**

This course will provide students with an in-depth understanding of the basic design methodologies of modern digital VLSI systems. Various perspectives of VLSI systems will be discussed, such as MOS transistor

device characteristics, interconnect, time and power, clock distribution, packaging and I/O issues, VHDL system design and logic synthesis. Upon completing this course, students will have a comprehensive understanding about digital VLSI system design.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 552

## **Random Signal Processing**

Introduces students to the theory of probability and stochastic processes. Topics include basic probability; single and multiple random variables; stochastic processes such as Gaussian processes, Markov processes; Various applications.

*3 lecture hours; 3 semester hours*

ELECTRICAL ENGINEERING 562 (ELEG 5623/MEEG 562)

## **Nanofabrication with Soft Materials**

This is an advanced level graduate course focusing on fabrication of soft materials. Nanofabrication processes and nanosystem products will be discussed. Fundamentals associated with chips fabrications and linking them toward soft materials assembly will be detailed. Emerging nanotechnology based methods for soft and green electronics, mechanical parts, MEMS, PCBS will be covered. Gene chip, label free sensory assay using micro and nanofluidics will be discussed. Transfer printing, DNA-protein interactions using the chip and several nano-scale assemblies for soft materials fabrication will be discussed.

*3 semester credits*

ELECTRICAL ENGINEERING 596

## **Seminar**

Lecture hours and topics to be arranged with instructor.

*1 credit hour*

ELECTRICAL ENGINEERING 597

## **Master's Project**

Lecture hours and topics to be arranged with Department Chair.

*3 credit hour*

ELECTRICAL ENGINEERING 598

## **Thesis in Electrical Engineering**

Lecture hours, semester hours and topics to be arranged with Department Chair.

*3-6 credit hours*

ELECTRICAL ENGINEERING 599

## **Independent Study in Electrical Engineering**

Independent study of advanced topics in Electrical Engineering and submission of

# Electrical Engineering • Engineering • Finance

project report as required. Problem assignment to be arranged with and approved by the Department Chair.

*3 credit hours*

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## Engineering

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ENGINEERING 400

### Engineering Colloquia Series

This course is a series of seminars covering a spectrum of engineering topics. National and international distinguished speakers are invited to deliver the seminars. All Engineering students are required to register for the colloquia series.

*1 lecture hour; 1 semester hour*

ENGINEERING 404

### Optimization

Optimization is the maximization of an objective function involving multiple variables, subject to certain constraints. This course introduces the theory and application of optimization. Topics discussed include optimization, linear programming, the simplex algorithm, transportation, assignment, decision analysis. Software used includes Excel spread sheet and LINGO.

*3 lecture hours; 3 semester hours*

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## Finance

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FINANCE 600

### Financial Management

This course provides students with the opportunity to learn the basic tools and concepts of financial management. It will discuss important issues in modern finance, including the time value of money, valuation of stock and bonds, capital budgeting, risk and return tradeoff, portfolio analysis, capital asset pricing model and financing decisions. Basic accounting and statistics are essential to understanding the principles developed in this course. Prerequisites: Admission to graduate study.

*3 semester credits*

FINANCE 610

### International Finance

This is an introductory course about international financial management with special emphasis on multinational enterprises (MNEs). A MNE is defined broadly as one

that is incorporated in one country but has operating subsidiaries, branches or affiliates located in other countries. Today, almost all large companies are multinational with the 1,000 largest MNEs accounting for about 80% of the world's industrial production. Main topics to be covered in this course include the foreign exchange market, exchange rate determination, foreign exchange risk management, and global debt and equity financing. The global financial environment such as the international monetary system and the balance of payments are also discussed. Prerequisites: FIN 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

FINANCE 620

### Investment Analysis

This course provides a framework for the analysis of individual securities such as stocks, bonds and other financial instruments. It develops a systematic framework for the construction of efficient portfolios and optimal investment strategies. It also discusses the investment environment that includes the financial markets and major financial institutions, the Federal Reserve, and the determination of interest rates. Various investment strategies used by practitioners are also discussed. Prerequisites: FIN 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

FINANCE 625

### Financial Derivatives and Risk Management

This course covers financial derivatives such as forward contracts, futures contracts, options and swaps. A derivative is a financial instrument that is derived from the value of an underlying asset. The underlying asset can be commodities, equities, bonds, foreign exchange, or indices such as a stock market index, consumer price index or even an index of weather conditions. These derivatives can not only be used for speculation and arbitrage, but more importantly, can also be used for risk management. Students will develop a working knowledge of how these derivatives are used and how they are priced. Prerequisites: FIN 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

FINANCE 630

### International Financial Management

This is an advanced course in international financial management. It will cover various aspects of financial management of multinational enterprises (MNEs), including the foreign exchange market, currency derivatives, global financial markets, international portfolio investment, cross-border direct investment, and foreign exchange and interest rate risk management. Prerequisites: FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses. Prerequisites for International Business: FIN 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

FINANCE 640

### Money and Banking

The course covers the nature and function of money and the role of depository institutions and central banks in influencing the supply of money and credit in the U.S. The course examines the changing financial environment and the influence of monetary policy on international trade, prices and the overall level of economic activity. Topics include the history of banking and financial institutions, regulation and the role of the Comptroller of the Currency and other regulators, bank operations, credit analysis, non-credit services, personal banking and the changing role of banks in the financial services environment. Prerequisites: FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

FINANCE 644

### Global Financial Services Regulation

A review of current U.S. Federal laws and regulations that govern the U.S. financial services industry, including the Federal Reserve Act of 1913; the Securities Acts of 1933, 1934 and 1940; the Monetary Control Act of 1980; the Riegle-Neal Act of 1994; and the Graham-Leach-Bliley Act of 1999. In addition, this course will review international regulatory arrangements including the FSA organizations of Great Britain and Japan. Laws protecting consumers in their interaction with financial services providers will be reviewed. The roles of the SEC, state insurance commis-

# Finance

sions and other self regulatory organizations such as the NYSE will be examined. Prerequisites: FIN 600, BLAW 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

FINANCE 650

## **Cases in Finance**

The focus of this course is the application of managerial finance principles (from FIN400: Financial Management) to the financial decisions made by business. The purpose is to develop student analytical ability through the discussion and analysis of finance cases. Topics covered include financial concepts and planning; valuation, rates of return and leverage; cost of capital; dividend policy; sources and uses of investment and working capital; and international finance. Prerequisites: FIN 600 and completion of all core courses or concurrent registration in final core courses.

For the Global Financial Services concentration, this course should be taken as the final required Global Financial Services course.

*3 semester credits*

FINANCE 705

## **Advanced Financial Management and Policy**

This course provides a general survey of the body of knowledge of corporate finance. Corporate finance is an area of finance dealing with the financial decisions corporations make and the tools and analyses used to make these decisions. The primary goal of corporate finance is to enhance corporate value and shareholder's wealth. To achieve this goal, financial managers must make important decisions such as project evaluations and investment decisions, financing decisions and dividend decisions. A solid understanding of the financial markets is also essential. The main concepts and principles in the study of corporate finance are also applicable to the financial problems of all kinds of firms. Basic accounting and statistics are essential to understanding the principles developed in this course.

*3 semester credits*

Prerequisites: FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

FINANCE 721

## **Management of Financial Institutions**

This course covers the management of financial institutions (FIs), including depository institutions such as commercial banks and savings institutions, insurance companies, securities firms and investment banks, mutual funds, and finance companies. The focus is on risk measurement and management facing these FIs. The roles and operations of financial markets and various financial instruments and the impact of interest rates on the economy will also be discussed. Prerequisites: FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

FINANCE 730

## **Financial Analysis and Modeling**

This course introduces important financial models and shows how they can be solved numerically and/or simulated using computer technology (e.g. Excel). This class covers standard financial models in the areas of corporate finance, financial statement simulation, accounting model, portfolio problems, options, portfolio insurance, duration, and immunization. It will give tools for understanding the computational intricacies in finance. Too often, finance courses stop short of making a connection between textbook finance and the problems of real-world business. This course bridges this gap between theory and practice by providing a nuts-and-bolts guide to solving common financial and accounting models with spreadsheets. Prerequisites: FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

FINANCE 735

## **Technical Analysis and Trading**

This is a hands-on course that teaches principles and methods of selecting and managing stocks using professional trading software. Theoretical concepts and trading principles will be taught throughout the course and students will manage an e-portfolio in real-time with imaginary funds. Prerequisites: FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

FINANCE 760

## **Investment Banking**

This course describes at the operation of investment banks. The structure of investment banking firms is examined and their relationship with banks and financial holding companies. The role and regulation of investment bankers in private and public offerings; international offerings; and mergers, acquisitions and other restructurings are reviewed. Also considered is the role and regulation of investment banks in the European Union and in Asia. Prerequisites: FIN 600, FIN 640 and completion of all required Global Financial Services concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

FINANCE 762

## **Insurance**

The focus in the insurance course is on financial, accounting, and management principles of the insurance industry. Emphasis is on interactions between selling new business and maintaining adequate levels of surplus. Topics include how an insurance company operates; how coverage and investment decisions impact an insurer's financial position; contract premium setting, coverages and limitations; and the role of the regulators. Prerequisites: FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

FINANCE 764

## **Commercial Banking**

Topics include the history of banking and financial institutions, regulation and the role of the Comptroller of the Currency and other regulators, bank operations, credit analysis, non-credit services, personal banking, and the changing role of banks in a deregulated financial services environment. Particular emphasis will be on practices in international banking and the recent credit and lending problems of global banks. Prerequisites: FIN 600, FIN 640 and completion of all required Global Financial Services concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

# Finance • Global Development and Peace

FINANCE 767

## Real Estate

The focus in the insurance course is on financial, accounting, and management principles of the insurance industry. Emphasis is on interactions between selling new business and maintaining adequate levels of surplus. Topics include how an insurance company operates; how coverage and investment decisions impact an insurer's financial position; contract premium setting, coverages and limitations; and the role of the regulators. FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

3 semester credits

FINANCE 768

## Financial Planning

This course will examine the interrelationship of the various investment vehicles available to meet the demands of financial planning. Topics covered include the fundamentals of financial planning, risk and insurance, tax planning, retirement planning and estate planning. FIN 600 and completion of all required Finance concentration courses or concurrent registration in final required concentration courses.

3 semester credits

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## GLOBAL DEVELOPMENT AND PEACE

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GLOBAL DEVELOPMENT AND PEACE 401-501

### Graduate Seminar in Qualitative Methods

This course is designed to introduce the student to qualitative research methods. Topics might include Content Analysis, Fieldwork and Observation, and Interviewing. The use of Grounded Theory will be examined as well as methodological issues of data collection, reduction, display, and interpretation. It is recommended that the student have a familiarity with quantitative research methods before taking this class, as this class will build on previously explored research topics.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 402-502

### Graduate Seminar in Quantitative Methods

This course is designed to build upon the students' previous research methods experience. Assuming a familiarity with survey research as a methodology, this course will

examine further quantitative research methods and procedures. Key emphasis will be placed on regression analysis and other statistical means of data interpretation, such as ANOVA, MANOVA, t-Tests, f-tests and others.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 411-511

### Issues in Economic Development

Course Description: This course explores current issues in economic development including poverty and poverty alleviation, strategies to overcome poverty and underdevelopment including microfinance, the roles of multilateral financial institutions, globalization, and the Washington Consensus. The course will also explore the roles of regional arrangements and development institutions in attempts to overcome underdevelopment. The theoretical underpinning of the course lies in the many schools of thought that have produced explanations of the causes and consequences of development and underdevelopment. The course attempts to plot strategies to achieve goals of economic development.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 422-522

### International Conflict Negotiation

This course examines theories about and sources of conflict (resource allocation and shortage; ideological, religious, and cultural disagreement; power distribution; perceptions of security; etc) to set the stage for conflict analysis and negotiation. In conflict analysis, the impact of cultural-linguistic systems on agreements and disagreements is examined. Culturally sensitive strategies of negotiation, conflict resolution, and mediation also are examined and practiced. Students will write several case reports on situations of conflict and also prepare a medium-length (20 pp. or so) term paper.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 427-527

### Culture and International Development

The course will examine development theory and the underlying cultural assumptions of Western models of socioeconomic development. It will also study the innovative non-Western models of development such as micro-credit in South Asian and the Confucian-influenced models of development in parts of East and Southeast Asia. This course

will identify the ways in which Western cultural assumptions can clash with the cultural underpinnings of many less developed countries. Using the case study method, learners will identify ways in which potential clashes are anticipated based on a region's history and its cultural underpinnings. Learners will assess the strategies currently used to address development-related challenges and, when appropriate, propose alternative strategies.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 460

### Sustainable Development

The course will examine the critical relationship between oil supply and demand and environmental challenges and the international priorities and policy initiatives of modern states. In looking forward into the 21st century, the course will identify and assess the policy options available to major international players, including the United States and the European Union; Saudi Arabia and other major oil producing countries; Japan, China and India and other consuming countries; transnational energy companies and non-governmental organizations (NGOs). Environmental concerns will be examined and policy options will be assessed within the context of sustainable economic development.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 500

### Graduate Co-op/Internship in Global Development and Peace

By Arrangement.

1-3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 521

### Inequality, Poverty and Globalization

This course examines two key issues for the international community in an era of globalization: inequality and poverty. Various theoretical, historical and empirical approaches will be used in analyzing the causes and consequences of inequality and poverty for the developing world. Students are also encouraged to develop economic, political, cultural, and social solutions to the chronic issues of poverty and inequality in the world.

3 Semester Hours

GLOBAL DEVELOPMENT AND PEACE 523

### Peace and Development

This course examines the relationship between peace and development. Security of the state, community, and the person is re-

## Global Development and Peace

lated to modalities of conflict – ethnic, ideological, religious – and their combined roles in retarding development. The course draws on regional examples and studies of conflict analysis, peacemaking, and the changing face of development. The course also examines strategies to overcome conflict and achieve development goals.

*3 Semester Hours*

### GLOBAL DEVELOPMENT AND PEACE 524

#### **Political and Economic Integration**

This course explores models of integration – functionalism, customs union, political integration, and federalism. Dual legislative systems are examined as instruments of harmonization of laws, and the roles of secretariats as vehicles of transition are explored. The course considers historical and contemporary models including the Federation of the West Indies, and the European Union. The course examines shortcomings of, and successful attempts at, political and economic integration.

*3 Semester Hours*

### GLOBAL DEVELOPMENT AND PEACE 528

#### **Global Economy and Terrorism**

This course identifies the underlying conditions needed for the realization of a stable global economy and it highlights the ways in which terrorism impacts on the stability of markets and on investment and lending trends and on interest rates in affected regions and states. The course also explores the “practical” rationale for terrorism as well as terrorism’s ideological and philosophical roots as well as the actual historical trajectory of terrorist organizations and states. Through the case study method, we will review those venues where terrorism has been diffused and attempt to understand such developments and their applications to contemporary society.

*3 Semester Hours*

### GLOBAL DEVELOPMENT AND PEACE 529

#### **Political Economy of Migration**

This course explores the constants and variables of immigration. The course will also consider the extent to which overseas investment in less developed countries and the strengthening of regional customs unions and the WTO will affect immigration trends. Due to the gap in the quality of life in developed versus less developed countries as well as the ongoing demand for cheap, unskilled labor, the number of immigrants to the developed world continues to grow in the United States

and in the European Union. This Course also invites learners to assess how the growing demographic of immigrants and their children may affect voting patterns, public education, and the foreign policy priorities of the developed societies where they tend to settle.

*3 Semester Hours*

### GLOBAL DEVELOPMENT AND PEACE 533

#### **Cultural Dimensions of Globalization**

While recognizing that a developing consensus exists on economic globalization, this course explores the broader cultural and philosophical implications of globalization. Extending beyond economic globalization to the social, political and cultural dimensions, one must indeed explore the substance of what is being “globalized” in each of these aspects of public life. This course invites learners to grapple with the question of whether or not the world is ready to implement an expanded globalization or whether a “dialogue among civilizations” is a necessary intermediary step in the process.

*3 Semester Hours*

### GLOBAL DEVELOPMENT AND PEACE 537

#### **Global Communication and Mass Media**

This course examines media’s role in global communication and nation building. In particular it studies information flow, media and development, communication and telecommunication policies, transnational media corporations and their role in economic development, media and public diplomacy, international journalism, and information and public campaigns.

*3 Semester Hours*

### GLOBAL DEVELOPMENT AND PEACE 560

#### **Sustainable Development**

This course focuses on issues related to sustainable development and preservation of the environment. To a significant extent, the course is reliant on the case study method. Through a geographically diverse series of case studies, the course will highlight the challenges faced by the development process due to the unmet social and quality of life demands of growing populations in less developed countries vis-à-vis the need to preserve and maintain the environment and endangered ecosystems. Through the case study method, strategies for caring for threatened energy resources will be assessed. The course will also use the case study method to understand the challenges that exist in devel-

oping strategies of economic growth that allow for significant improvement in the quality of life of local populations as well as the protection of wetlands, endangered species, hydrologic cycles and clean water supply.

*3 Semester Hours*

### GLOBAL DEVELOPMENT AND PEACE 591

#### **Internship**

Students will complete an eight-week cross-cultural internship with international organization or overseas school, agency or company. A written report by the student and an assessment of the Student’s performance by the agency where the student interns will be submitted as the basis of evaluation.

*3 semester hours*

### GLOBAL DEVELOPMENT AND PEACE 598

#### **Tutorial**

The tutorial is offered at the completion of the internship. The tutorial invites students in the Master of Arts in Global Development and Peace program to reflect on their internship experience based on the student’s experiences prior to and during the tutorial. The tutorial also prepares students for the program’s comprehensive exam that includes both an oral and a written component and is conducted in the final weeks of the tutorial class. As a part of the tutorial students also assemble a portfolio of all of the major papers and projects that they have completed during the program and a written reflection on that work.

Prerequisite courses: GLDP 591 and completion of at least 21 semesters hours of the GLDP program.

### GLOBAL DEVELOPMENT AND PEACE 599

#### **Thesis**

As a final project demonstrating competency, students are asked to write and defend a thesis.

*3 semester hours*

### GLOBAL DEVELOPMENT AND PEACE 600

#### **Thesis Extension**

*1 semester hour*

*The following courses taught by the School of Business also are available to Global Peace and Development students. Full course descriptions are available under the primary course listings.*

# Global Development and Peace • Graduate Studies in Business

MGMT 561

## **Economic, Regulatory, Political, Cultural and Societal Issues in Environmental and Energy Management**

MGMT 560

## **Foundations of Environmental and Energy Management**

GRADUATE STUDIES IN BUSINESS 541 / MKTG 550

## **Global Market Management**

GRADUATE STUDIES IN BUSINESS 562 / MGMT 598

## **Advanced Intellectual Property Management**

GRADUATE STUDIES IN BUSINESS 511 / FIN 500

## **International Trade and Finance**

GRADUATE STUDIES IN BUSINESS 524 / FIN 525

## **International Financial Management**

GRADUATE STUDIES IN BUSINESS 528 / FIN 543

## **Technical Analysis & Trading**

GRADUATE STUDIES IN BUSINESS 537 / MGMT 532

## **Global Program and Project Management**

GRADUATE STUDIES IN BUSINESS 538 / MGMT 533

## **Information Technology Strategy and Governance**

GRADUATE STUDIES IN BUSINESS 539 / MGMT 534

## **Strategic Sourcing and Vendor Management**

GRADUATE STUDIES IN BUSINESS 580 / MGMT 523

## **Leadership, Teams & Managing Change**

GRADUATE STUDIES IN BUSINESS 511 / MKTG 550

## **Global Market Management**

GRADUATE STUDIES IN BUSINESS 543 / MKTG 543

## **Problems in Marketing Research**

GRADUATE STUDIES IN BUSINESS 548 / MKTG 530

## **e-Marketing**

GRADUATE STUDIES IN BUSINESS 549 / MKTG 551

## **Product Management, Innovation and Commercialization**

## **Graduate Studies in Business**

## **Graduate Studies in Business**

\*Former course numbers for Graduate Studies in Business.

GRADUATE STUDIES IN BUSINESS 400  
(GSB 400/ACCT 400)

## **Accounting Concepts**

Introduction to American financial accounting principles based on FASB, including the measurement, processing, and communication of accounting information for use by a variety of users including business owners, managers, creditors, prospective investors, and others interested in the financial condition of an entity and the results of its operations. Topics covered will include the accounting cycle, merchandising, services,

fixed assets and corporate accounting issues. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 410  
(GSB 410/ECON 400)

## **Economic Analysis**

This is a course for managers in both micro and macro economics. Topics addressed will include the prevailing patterns of economic institutions, national income analysis, international trade, prices and production; economic development, market structure and consumer decision analysis, competition, monopoly and monetary policy issues. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 420 (GSB 420/FIN 400)

## **Financial Management**

This course is intended to provide a practical and theoretical market valuation-oriented framework for analyzing financial decision problems faced by investors and corporations. Lectures and readings will provide an introduction to the Markowitz diversification concept, Portfolio Analysis, Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT), project evaluation, mortgage problems and derivative securities like Interest Rate Swaps, Options and Futures, and also related issues. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 430  
(GSB 430/MGMT 400)

## **Organizational Behavior**

This course permits students to examine both theory and practice of interpersonal, group process and organizational behavior. Individual and small group projects develop and illustrate principles of relationships, communications, role assignment, leadership and conflict management in organizations. Experiential designs permit learning through group participation, case analysis and individual problem solving. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 431  
(GSB 431/MGMT 450)

## **Foundations of Business Process and Operations Management**

The student is introduced to process management methods which are fundamental to delivery of products and services. Topics covered include capacity analysis and planning, inven-

tory management, design of jobs for quality and cost effectiveness, demand forecasting, work flow management, queuing theory, project management and total quality management. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 440  
(GSB 440/MKTG 400)

## **Marketing Concepts**

The process of planning and executing the conception, pricing, promotion and distribution of ideas, goods and services, to create exchanges that satisfy individual, organizational, and societal objectives will be explored. The underpinnings of the marketing discipline will be taught through text, articles and class discussion. Mastery of these principles will come through a variety of individual and group assignments to create marketing solutions for real-world products. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 441  
(GSB 441/TEXT 400)

## **Beginning Textiles**

This course covers the basic concepts of textiles dealing with fibers, yarns and methods of fabric construction. Special laboratory assignments devoted to natural and synthetic fiber identification and testing. \$15 lab fee. Prerequisite: Admission to graduate study and approval of faculty advisor.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 451 (GSB 451/ITIS 400)

## **Fundamentals of Information Technology**

An examination of information system goals, development, and utilization. This course develops the fundamental knowledge, philosophy, and skills necessary for requirements specification, development and utilization of computer-based information systems and how various businesses are developed and run in the world of e- and m-commerce and information technology. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 452 (GSB 452/STAT 400)

## **Statistical Decision Theory**

An introduction to basic statistical methodology and its applications to business decision making. Main topics include probabilities, discrete and continuous probability distributions, probability sampling techniques, sampling distributions, interval estimation and hypothesis

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testing. Students are encouraged to use software packages to perform statistical analysis. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 500  
(GSB 500/ACCT 500)

### **Managerial Accounting**

This course provides an introduction to managerial and cost accounting used by management in conducting daily operations, planning future operations, and developing overall business strategies. The objective is to gain an understanding of the role of accounting in the management process of planning, directing, controlling, and improving the organization's objectives (goals) and to translate those objectives into a course of action. Prerequisite: Graduate Studies in Business 400.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 501  
(GSB 501/ACCT 501)

### **Intermediate Accounting**

This course applies generally accepted accounting principles to the preparation of financial statements, including balance sheets, income statements, statement of cash flows, and retained earnings statements. Accounting for leases, employee benefits, deferred taxes and other specialized accounting topics will also be explored. Prerequisite: Graduate Studies in Business 400.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 502  
(GSB 502/ACCT 510)

### **International Accounting**

Examines the diverse accounting practices employed by different countries and their effects on multi-national firms' operation, as well as efforts to standardize IASB/FASB rules. Performance evaluation in multi-national enterprises, impact of differences in national accounting principles and practices, and accounting under central planning is also examined. Discussion topics include the critical problem areas such as taxation, transfer pricing, financial planning, and information systems within an international framework. Prerequisite: Graduate Studies in Business 400.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 504  
(GSB 504/ACCT 520)

### **Auditing**

Laws and methods for conducting commercial audits will be examined. Ethics, attesta-

tion standards, controls and fraud detection are among the topics that will be examined. Application of generally accepted accounting practices to the review of financial statements, as well as the responsibility of the certified public accountant to the various users of the statements will also be explored. Prerequisite: Graduate Studies in Business 400.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 505  
(GSB 505/ACCT 530)

### **Fundamentals of Personal Taxation**

An overview of the major types of personal taxes used by governments to raise revenue. This course places an emphasis on the taxation of individuals and tax planning considerations for the individual. Prerequisite: Graduate Studies in Business 400.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 506  
(GSB 506/ACCT 511)

### **Advanced Financial Accounting**

An overview of selected accounting topics of interest to international business students. Topics include current practice in accounting for business mergers or acquisitions, accounting for stock investments in affiliated companies, an introduction to consolidated financial statements, accounting for branch operations and an introduction to accounting for state and local governmental units. Prerequisite: Graduate Studies in Business 400.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 508  
(GSB 508/ACCT 502)

### **Financial Reporting and Analysis**

An overview of generally accepted accounting principles underlying the content of financial statements including alternative inventory valuation methods, lease accounting, segment reporting and reporting for employee benefit plans. Study and analysis of actual corporate annual reports and government and not-for-profit financial statements. Prerequisite: Graduate Studies in Business 400.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 509  
(GSB 509/ACCT 531)

### **Fundamentals of Business Entity Taxation**

An overview of the major types of corporate and business entity taxes used by governments to raise revenue. This course places an emphasis on the tax issues of different business forms, tax management and tax planning

considerations for the business entity. Prerequisite: Graduate Studies in Business 400.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 510  
(GSB 510/MGMT 550)

### **Managerial Economics**

This course is an advanced examination of the role of economics in management decision-making, focusing on applied price theory with case analysis. The course provides advanced level analysis and application of micro and macro economic theories to managerial issues and the decision making process. Prerequisite: Graduate Studies in Business 410.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 511 (GSB 511/FIN 500)

### **International Trade and Finance**

International trade and finance in the world economy. Topics include the foreign exchange market, exchange rate behavior and international parity conditions, foreign exchange risk management, and global debt and equity financing. The international environment within which such management is conducted will also be discussed. Prerequisite: Graduate Studies in Business 410, 420 and 452.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 520 (GSB 520/FIN 505)

### **Advanced Financial Management and Policy**

This course is intended to provide advanced techniques for financial management, from the viewpoint of both the financial officer or manager and creditor or stockholder. The course will examine recent developments in both financial theory as well as on Wall Street, including advanced derivatives, for example exotic options and real options, etc. Decisions are analyzed using sources and uses of funds, capital budgeting, portfolio theory and the capital asset pricing model frameworks. Prerequisite: Graduate Studies in Business 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 521 (GSB/FIN 521)

### **Financial Management of Financial Institutions**

The purpose of this course is to apply traditional finance concepts to the management of financial institutions, including commercial and investment banks and insurance companies worldwide. It emphasizes decision making and specific problem solving techniques. The basic format is to introduce a problem, discuss the relevant recent financial concepts, provide an analytical framework, and then ap-

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ply decision tools. It also examines the risk and return impacts of various credit, investment, operational, and funding decisions. Prerequisite: Graduate Studies in Business 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 522 (GSB 522/FIN 541)

### **Investment Analysis**

This course is intended to provide a practical and theoretical market valuation-oriented framework for analyzing financial decision problems faced by Investors. Topics introduced will include Markowitz diversification concept, Portfolio Analysis, Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT), and derivative securities, like Interest Rate Swap, Options and Futures. This course also will cover topics on Financial Engineering for the new financial innovation. Prerequisite: Graduate Studies in Business 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 523 (GSB 523/FIN 542)

### **Financial Futures, Options, and Swaps**

This course will provide a practical and theoretical framework for analyzing financial decision problems faced by investors using options and related financial instruments. Real price data will be used to practice strategies for risk arbitrages and hedging using computer software. Strategies using various kinds of options will be analyzed and arbitrage opportunities will be developed and analyzed. Students will also learn how to design their own strategies for different situations. Equity, Index, Futures, Foreign currency, Interest Rate, and Commodity options are all analyzed. Prerequisites: Graduate Studies in Business 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 524 (GSB 524/FIN 525)

### **International Financial Management**

This is an advanced course in international financial management covering various aspects of financial management of multinational enterprises (MNEs), including global financial markets, international portfolio investment, cross-border direct investment, and foreign exchange and interest rate risk management. Prerequisites: Graduate Studies in Business 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 527 (GSB 527/FIN 540)

### **Financial Analysis and Modeling Methodology**

This class offers practical exposure to quantitative financial modeling using the analytical tools available in Excel. Theories addressed and modeled include Markowitz Mean Vari-

ance Model, Black-Scholes and Binomial models, immunization strategies and other important financial modeling theories. Prerequisites: Graduate Studies in Business 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 528 (GSB 528/FIN 543)

### **Technical Analysis & Trading**

This is a hands-on course that teaches principles and methods of selecting and managing stocks using professional trading software. Theoretical concepts and trading principles will be taught throughout the course and students will manage an e-portfolio in real-time with imaginary funds. Prerequisite: Graduate Studies in Business 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 530

(GSB 530/MGMT 530)

### **Foundations of Management and Organization**

Concepts, methods and research, which are applicable and useful in the management of organizations, are broadly surveyed to increase student's awareness of the breadth and complexity of management processes. Fundamentals of business strategy, organizational structuring, leading, communicating and controlling are examined within contexts of the historical evolution of management thought, concern for high business ethics, and meeting global competition. Prerequisite: Graduate Studies in Business 430.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 531

(GSB 531/MGMT 531)

### **Small Business and Entrepreneurship**

A comprehensive review of the marketing, operational, financial, product, service and business strategy and plans that must be mastered and developed as foundation for start-up of a small business or entrepreneurial enterprise. In addition, the growth of existing business, through Intrapreneurship, is also covered. Students are required to develop a comprehensive business plan for a business of their choice and which is acceptable to the instructor.

Prerequisites: Completion of all core courses.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 532

(GSB 532/MGMT 540)

### **Advanced Business Process and Operations Management**

Students in this course apply the methods from GSB 431 to projects of their own design and choosing, employing systems designed

for application to process management issues. Emphasis is put on quantitative and databased problem-solving and decision-making processes applied by the professional manager for the improvement of product or service development quality and customer satisfaction. Business process improvement techniques such as lean, SixSigma and others will be covered. Prerequisite: Graduate Studies in Business 431 and 452.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 533

(GSB 533/MGMT 511)

### **Human Resources Management.**

An in-depth survey of current theory, research and practice in the management of human resources in organizations. Job design, recruitment, selection, performance feedback, goal-setting, training, employee rights, safety, compensation and benefits issues are reviewed within the context of their application in the United States as a world standard for such practices, with comparisons to customs and practices in the international arena. Intensive research into current human resource topics are required. Prerequisite: Graduate Studies in Business 430.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 534

(GSB 534/MGMT 512)

### **Organizational Development**

The theory and practice of organization development and evolution is explored. Principles of managing change are discussed. Types and levels of intervention are evaluated. Sources of resistance to organizational change are examined and methods for overcoming that resistance are studied. Students apply theory and technology experientially to intervention projects with groups or organizations they currently have access to and evaluate the effectiveness of the approaches used. Prerequisites: Graduate Studies in Business 430.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 535

(GSB 535/MGMT 535)

### **Finance and Accounting for Non-financial Managers**

This class will provide managers with the skills required to read, interpret and apply information about an organization's financial position. Managerial accounting and finance concepts will be presented, followed by financial statement analysis. Topics presented from a managerial perspective will include how accounting

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data is generated during business operations, how financial statements are created, management of finance to maximize return on investment and stakeholder equity and other related topics. Students will be required to participate in case work applying the principles presented in the class. This course is not intended for those seeking to pursue a career in either the financial or accounting services fields. Prerequisite: Graduate Studies in Business 400 and 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 536  
(GSB 536/MGMT 522)

### **Conflict & Negotiation**

The development of conflict-management and negotiating skills are taught in this course with particular emphasis on achieving effective and efficient outcomes within a global and multi-cultural context. Experiential exercises, readings and discussions will demonstrate various strategies for a broad range of negotiating scenarios, e.g., buyer-seller, management-labor, personal salary increase, etc. Prerequisite: Graduate Studies in Business 430.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 537  
(GSB 537/MGMT 532)

### **Global Program and Project Management**

This course focuses on the managerial aspects of how to more effectively manage, plan and execute programs/projects with a focus on high quality deliverables arriving on time, within budget, within scope and to the customer's satisfaction. Areas covered will include program and project management life cycle phases, executive sponsorship, portfolio investment management selection and prioritization, requirements, scope and project charters, planning, development, estimating, staffing, leadership, scheduling, risk management, change management, project metrics, vendor integration and management and other related topics. This course is based on current and emerging best practices and principles. It will also discuss PM certification requirements and provide real world case studies. Prerequisite: Graduate Studies in Business 430 and 431.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 538  
(GSB 538/MGMT 533)

### **Information Technology Strategy and Governance**

This course covers information technology plans, strategy, business/IT alignment, gov-

ernance, environmental, ethical, economic, regulatory, compliance and technical issues and trends with a focus on planning, organizing, justifying, controlling, implementing and integrating concepts and real world experiences. It discusses business and IT balanced scorecards, metrics and key performance indicators. Current and emerging best business and technology strategy and governance best practice frameworks such as COBIT, CMMI, PMBOK, Kano, VOC, QDF, ITIM, Prince2, ITIL, select ISO standards and others will be covered with emphasis on lessons learned, critical success factors and pragmatic solutions. Individual and team projects and case studies are integrated into the course. Prerequisite: Graduate Studies in Business 430.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 539  
(GSB 539/MGMT 534)

### **Strategic Sourcing and Vendor Management**

This course covers the rewards and risks of outsourcing and vendor management and identifies where outsourcing should be used and not used. The objectives of the course are to help students understand how to plan, direct, manage and more effectively participate in outsourcing initiatives in terms of the feasibility of outsourcing (off-shore, near-shore, rural-shore, best shore), vendor selection, contract negotiation, vendor management and evaluation, risk assessment and terminating outsourcing deals. Prerequisite: Graduate Studies in Business 430 and 431.

*3 semester hours*

MANAGEMENT 536

### **Foundations of Corporate, Government and Information Security and Continuity Management**

The course covers natural and terrorist hazards and incidents that could impact the continuity of business, government and information services, their detection, evaluation and containment, prevention and recovery management principles and practices. Topics covered include assessment of threats, risk management and mitigation, incident management, business continuity/contingency planning and disaster recovery programs. Case studies of natural and made-made disasters such as 9/11, Katrina and others are analyzed in terms of lessons learned. Student will work on individual and team projects that will include the development of a business continuity plan.

*3 semester hours*

MANAGEMENT 541

### **Foundations of Bio Tech Sciences and Management**

This course covers the comprehensive scope of knowledge of major issues and technologies in the bio technology field. This includes regulatory, robotic, imaging, cybernetics, bio-informatics, genetics, ethics and related areas. Individual and team projects will be assigned. Prerequisite: Graduate Studies in Business 560 and GSB 451.

*3 semester hours*

MANAGEMENT 551

### **Foundations of Doing Business in India**

The course provides the fundamental knowledge of how to do business in India. It covers the economic, financial (tax), political, cultural, regulatory, infrastructure, environmental, marketing, trade, labor force and education system, demographic and technology issues, trends and practices. It identifies the various trade agreements and their implications in doing business in or with Chinese organizations. It also exposes students to U.S. federal, state and local government resources available to help establish business and trade relationships in India. Prerequisite: Graduate Studies in Business 410, 420 and 430.

*3 semester hours*

MANAGEMENT 552

### **Foundations of Doing Business in China**

The course provides the fundamental knowledge of how to do business in China. It covers the economic, financial (tax), political, cultural, regulatory, infrastructure, environmental, marketing, trade, labor force and education system, demographic and technology issues, trends and practices. It identifies the various trade agreements and their implications in doing business in or with Chinese organizations. It also exposes students to U.S. federal, state and local government resources available to help establish business and trade relationships in China. Prerequisite: Graduate Studies in Business 410, 420 and 430.

*3 semester hours*

MANAGEMENT 560

### **Foundations of Environmental and Energy Management**

This course covers the assessment of current and potential environmental and energy management issues, opportunities and threats. Key issues such as global warming,

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pollution, global energy supply and demand needs will be discussed. Alternative energy sources are reviewed, including examination of energy technologies in each fuel cycle stage for fossil (oil, gas, synthetic), solar, biomass, wind, hydro, nuclear, and geothermal energy types, along with storage, transmission, and conservation issues. Prerequisite: Admission to the graduate program.

*3 semester hours*

MANAGEMENT 561

### **Economic, Regulatory, Political, Cultural and Societal Issues in Environmental and Energy Management**

This course will focus on the relationship and impact that international relations, international business, and foreign policy have on world trade, commerce, and finance with respect to environmental and energy management issues. The course will provide the student with a better understanding of how the complexity of international differences affects political, economic, cultural and social behaviors related to environmental and energy policies, regulations and international commerce. Prerequisite: Graduate Studies in Business 570.

*3 semester hours*

MANAGEMENT 570

### **Foundations of Healthcare Management and Administration**

This course focuses on a systematic exploration of the health care system in the United States, government interactions and regulations, delivery systems, healthcare insurance and financing, health care providers, innovations in healthcare services and alternative strategies. Prerequisite: Admission to the graduate program.

*3 semester hours*

MANAGEMENT 571

### **Foundations of Service Management and Engineering**

With the rapid growth of the services industry, this course integrates topics from economics, engineering, law, technology and organizational theory to deal with how firms change over time to become more service oriented or become service business and the mechanisms and tools by which they seek innovation and competitive advantage in the service sector. The services life cycle is reviewed. In addition, enabling technologies and how different disciplines help to answer questions about how business services combine, evolve, standardize and mature are

covered. Prerequisite: Graduate Studies in Business 410, 451, 431 and 560.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 540  
(GSB 540/MKTG 540)

### **Buyer Analysis**

This course will take up special topics in buyer behavior. The leading models of buyer behavior in both industrial and consumer settings will be analyzed. The qualitative and quantitative marketing research tools necessary to understand buyer behavior dynamics in any market will be stressed. Cases will be drawn from market situations around the world. Prerequisite: Graduate Studies in Business 440.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 541  
(GSB 541/MKTG 550)

### **Global Market Management**

Strategy planning, implementation and control for market entry and development. Topics include social, political and economic changes affecting marketing opportunity; focused versus dispersed marketing efforts; marketing in developed and undeveloped countries; and marketing systems required for the various strategic alternatives. Prerequisite: Graduate Studies in Business 440.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 542  
(GSB 542/MKTG 560)

### **Mass Merchandising & Retailing**

An analytical study of national and multinational mass merchandising organizations that include origin, concepts, operations, technology and profitability. Comparison of in-store mass-merchandisers and non-store catalog retailers, on-air merchandisers and on-line marketers. Students prepare a catalog, an on-air, and an e-tailing presentation using a mass market approach. Students utilize "CATALOG", "STORY-BOARD", "SHOW and SELL", and "VIRTUAL MERCHANDISING" CAD/CAM software to prepare presentations. Prerequisite: Graduate Studies in Business 441 and approval of faculty advisor.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 543  
(GSB 543/MKTG 543)

### **Problems in Marketing Research**

Approaches to sampling, designing survey instruments, developing the right statistical design for analysis of data and analyzing resultant data both quantitatively and qualita-

tively are explored in this course. Effective methods for organization and reporting of research results are studied and put to practice by the student. Effective research methodology is emphasized. Prerequisite: Completion of all Core courses.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 544  
(GSB 544/MKTG 561)

### **Fashion & Retail Buying**

Inventory and stock control procedures, analysis of consumer demand in the buying and marketing of fashion products. Six month budget planning of sales, goods and promotional activities. Spreadsheets and computer applications are used to plan, analyze and adjust retailing activities by revisions in quantities and merchandise assortments. Practice in buying from a variety of domestic and international resources. Prerequisite: Graduate Studies in Business 441 and approval of faculty advisor.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 545  
(GSB 545/MKTG 562)

### **Advanced Textiles & Product Development**

A study of the history of textiles and of current material resources, production, distribution, and marketing techniques and consumption within the textile and apparel industries and their interrelationships. A portfolio of the history of fabrics and a swatch booklet of fashion fabrics is required. Prerequisite: Graduate Studies in Business 441 and approval of faculty advisor.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 546  
(GSB 546/MKTG 552)

### **Services Marketing**

The course addresses the unique problems of marketing intangibles in the broad spectrum of service industries. The course focuses on the development, implementation and control of strategy, systems and people for effective service operations. This is a case study course. Prerequisite: Graduate Studies in Business 440.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 548  
(GSB 548/MKTG 530)

### **e-Marketing**

This course examines the nature of marketing in the evolving virtual worlds of Internet and mobile commerce and the impact of emerging technologies on the strategy of traditional

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“brick-and-mortar” companies. Various business and marketing models will be analyzed and evaluated. This course requires extensive Internet research for student projects. Prerequisite: Graduate School of Business 440.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 549  
(GSB 549/MKTG 551)

### **Product Management, Innovation and Commercialization**

This course covers new product development, innovation and commercialization, as well as the product management life cycle. Topics covered include the feasibility and investment prioritization of new products or product enhancements, raising capital for new product development, market and customer needs analysis, make versus buy alternatives and product launch and commercialization issues and considerations, including promotion, pricing, distribution, competition, pre and post sales support, systems and infrastructure support, customer service and related areas. Student will work on individual and team projects that will include the development of a new product market/business plan. Prerequisite: Graduate School of Business 431/ Graduate School of Business 420.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 551 (GSB 551/ITIS 540)

### **Decision Modeling and Simulation**

Study of the formulation and simulation of business models to enhance the decision making process. Topics include scope, nature and types of simulation models and languages. Emphasis is on basic concepts, techniques in modeling, interpretation, validation, and optimization. Computer simulation and queuing models will be developed and evaluated. Prerequisites: Completion of all Core courses, advanced Excel skills and comfort in applying statistical techniques. Instructor may test students for acceptable knowledge during the first class.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 552 (GSB 552/ITIS 530)

### **Internet Applications and Opportunities**

The focus of this course is to acquaint the student with the structure of electronic and mobile commerce through incorporating technologies. Subjects include e-commerce vs. e-business, design vs. technology, e-business architecture, effective web-site design and maintenance, HTML, XML, CRM, ERP,

standards, security, information search and retrieval, and data warehousing. Course format includes discussion and case analysis, and both individual and small group projects. Prerequisites: Graduate Studies in Business 451. Instructor may test students for acceptable knowledge during the first class.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 553 (GSB 553/ITIS 550)

### **Information Technology Security**

This course covers the fundamentals of information technology security including threat and risk management, impact analysis and mitigation strategies. It identifies the major causes of threats (e.g. natural and man-made) and develops contingency and disaster prevention and recovery plans. It discusses information technology continuity plans and strategies. It deals with physical, cyber and personnel security. It also defines the overall responsibilities for the protection of an organization's information technology assets. Prerequisites: Graduate Studies in Business 451. Instructor may test students for acceptable knowledge during the first class.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 554 (GSB 554/ITIS 520)

### **Information Systems Requirements, Analysis, Design and Deployment**

A course in the analysis, design, and development of business systems. Students will learn a variety of development models and tools available for systems development, deployment and management. The role of all systems constituents is addressed through discussion of the specification, decision-making, and review of designs, documentation, program specifications, and system improvement. Course level and content is suitable for managerial as well as the more technically oriented. Prerequisites: Graduate Studies in Business 451 and 555. Instructor may test students for acceptable knowledge during the first class.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 555 (GSB 555/ITIS 551)

### **Enterprise Architecture and Knowledge Management**

This course covers enterprise data issues and opportunities from a knowledge management and business intelligence perspective. It focuses on the enterprise data architecture, data policy, data distribution, database management systems, data warehouse, mining

and mart, business intelligence, knowledge management, chief architect and capturing lessons learned. Prerequisites: Graduate Studies in Business 451.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 557 (GSB 557/ITIS 552)

### **Information Services Infrastructure, Service Management and Delivery**

This course covers the fundamentals of data networking, including signaling, routing and technologies underlying the explosive growth of e- and m-commerce. The managerial issues relevant to network utilization, security and service delivery will be addressed as the underlying communications technologies are discussed. Prerequisite: Graduate Studies in Business 451.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 559 (GSB 559/ITIS 553)

### **Enterprise Information Systems**

This course will examine the role of information systems in business and how they provide the information required by management. Modular, best of breed, and other systems strategies and configurations, as well their managerial implications, will be examined. The course is case-based and provides the student hands-on experience learning and utilizing Sage Software's MAS200 ERP system to complete case problems. Other enterprise systems will be discussed as well, including SAP and Oracle. Prerequisite: Graduate Studies in Business 451.

*3 semester hours*

INFORMATION TECHNOLOGY 521 (ITIS 521)

### **Healthcare Management and Administrative Technologies and Systems**

This course covers the health care systems, processes and technologies as they relate to the constituents in the health care industry – patients, providers, regulators, insurance companies and their interactions. Also covered are electronic records, privacy and the applicable regulations. Prerequisite: Graduate Studies in Business 451.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 560

(GSB 560/MGMT 580)

### **Business and Society: Intellectual Property and Anti-Trust Law**

This course reviews the basic principles of United States Intellectual Property law (patents, copyrights, trade secrets, trademarks and the protection of ideas), with accompa-

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nying ethical issues; and explains how international treaties (e.g. Berne Convention) have affected global trade. It covers select anti-trust laws in the United States, and what they cover. It analyzes to what extent parties outside the United States, doing business in or with the United States, are subject to United States' anti-trust and intellectual property laws. Prerequisite: Admission to graduate study.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 561  
(GSB 561/MGMT 597)

### **Business Strategy (Capstone)**

A capstone course dealing with the development and implementation of business strategy and plan within a framework of ethical decision-making, globalization and managing accelerating change. It tests the capability of the student to apply all prior learning to solve actual strategic management problems. The final project of this course is project-based and shall constitute, therefore, an outcome assessment of what the student has learned in the MBA program. This project, normally an extensive and comprehensive case study, will be graded by several faculty members representing different and relevant disciplines.

Prerequisite: Final semester for completion of M.B.A. Program

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 562  
(GSB 562/MGMT 598)

### **Advanced Intellectual Property Management**

Protection of a business' intellectual property assets can make the difference between success and failure. This course will discuss the strategies and methods available for protection of intellectual property in the global environment. Students will work through the American patent, copyright and trademark processes, including how to prepare and file applications for each. Students completing this course should be able to pass the Patent Agent exam. Global business issues, such as protection of ideas in an off-shoring arrangement, IP co-development and other issues, will also be addressed. Prerequisite: GSB 560, MEEG 490 or instructor approval

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 570  
(GSB 570/MGMT 539)

### **International Issues**

This course focuses on current international issues that affect business operations at home and abroad. Changing business envi-

ronments are discussed and analyzed. Students are required to formulate new global business strategies in light of emerging international trends and events. In some cases, students may supplement their study by field trips and on-site analysis. Prerequisite: Graduate Studies in Business 440.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 580  
(GSB 580/MGMT 523)

### **Leadership, Teams & Managing Change**

This course focuses on the development of leadership skills important in the effective management of change. Through role-playing exercises, videotapes, diagnostic tools, seminar discussion, selected readings, and a group project, students will learn theory and build interpersonal skills necessary for providing leadership in diverse multicultural groups and organizations. The course will address the managerial issues present in organizations undergoing accelerating change and adopting a culture of creativity. Creating and sustaining high performance multicultural and interdisciplinary traditional and virtual teams is covered. Prerequisite: Graduate Studies in Business 430.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 581  
(GSB 581/MGMT 581)

### **Business Games**

Each student-executive will assess changing industry and competitive conditions, evaluate the strategies of competitors, carefully craft ways to secure a competitive advantage to increase their case company's market shares by correctly forecasting industry-wide demands for individual market segments, and plan in advance for production capacity expansions to take advantage of growing market demands. The student gets the opportunity to make decisions testing his or her ability to apply logic, insight, judgment and common sense and evaluate the resulting impact on profits, stockholder equity, customers or clients and investors. Prerequisite: Final semester for completion of MBA program or approval by faculty advisor.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 582  
(GSB 582/MGMT 599)

### **Internship**

This course should be taken towards the end of the student's program of study and requires the approval of the student's faculty

advisor.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 595

### **Independent Study in Business**

This course is reserved for a special project that cannot be done any other way and to help a student complete the MBA when no other alternative is available. Prerequisite: Written approval to register by the Director and the Department Chair.

*3 semester hours*

GRADUATE STUDIES IN BUSINESS 599

### **Thesis Project**

Completion of a report based on field, library and institutional research to demonstrate ability to conduct investigations in a managerial discipline and simulation techniques. Prerequisite: Final semester of graduate study and approval of faculty advisor.

*3 semester hours*

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## Information Systems and Knowledge Management

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INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 600

### **Information Systems and Technology**

Information technology has become a key component for accomplishing strategic and operational goals in organizations today. As such, organizations expect their new employees to have a basic understanding of information technologies. To accomplish organizational goals and advance one's career path, one needs to understand and apply information technologies effectively, efficiently, and creatively. The purpose of this course is to provide an introduction to information systems and technology and to familiarize students with the fundamental concepts and principles of information systems. The course is targeted for graduate students who have little or no background in information systems. Therefore, it focuses on breadth of coverage rather than depth in any specific area.

Prerequisites: Admission to graduate study.

*3 semester credits*

INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 620

### **Information Systems Development and Design**

This course introduces a variety of development method and tools available for information systems development and its manage-

# Information Systems and Knowledge Management

ment. This is a hands-on course and is targeted at beginning graduate students who have basic knowledge in the area of MIS. Topics to be covered include techniques and issues related to software development life cycle (SDLC), systems analysis and systems design along with other topics such as BPR (Business Process Reengineering) and ERP (Enterprise Resource Planning). Systems analysis and design methods covered in this course include data flow diagram (DFD) and entity-relationship (ER) approach. Prerequisites: ITKM 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 651

## **Knowledge Management and Business Intelligence**

This course will explore various issues of creating, storing, sharing and applying knowledge in organizational environment. The course introduces guiding theories and concepts of knowledge management and examines various tools used in the processes. Then the course also explores business and management topics in knowledge management, including general issues in evaluating informal systems like knowledge management systems and the relationship of knowledge management to the work, etc. Prerequisites: ITKM 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 654

## **Database Organization and Management**

This course introduces the fundamental concepts and implementations of the relational database systems. Most of class time will be spent on the relational model and SQL as well as the Entity-Relationship model. You will be proficient in designing and programming database systems using Database management systems such as MS ACCESS. We also will focus on the web-based database design using Visual Basic as a front-end. Prerequisites: ITKM 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 656

## **Business Programming with Visual Basic .Net**

The purpose of this course is to provide an introduction to a modern business pro-

gramming. This course is designed to provide students with the fundamental concepts and implementations of a newly developed programming language (visual basic.net). It is designed for who have little or no background in programming languages. Learning any programming language needs lots of hands-on practices, so students are expected to practice themselves what they learn in class. Prerequisites: ITKM 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 720

## **Electronic and Mobile Business**

The goal of this course is to prepare current and future executives, managers, and strategists to be leaders and create value in the New Economy – to gain understanding and insight on how the functions of management and marketing in the New Economy have changed as well as how new technology and media forms have created a radically different business environment. The course examines the impact of the evolving virtual worlds of Internet and mobile commerce on the strategy of traditional “brick-and-mortar” companies. Up-to-date information will be utilized from current publications to provide the student with the ability to work in the new wireless world. This new business frontier requires most firms to significantly change their business strategy and presents unprecedented new opportunities for fast acting entrepreneurs. Prerequisites: Completion of all required Information Technology and Knowledge Management or Marketing required concentration courses or concurrent registration in final required concentration courses. Course is Cross-Listed with MKTG 720.

*3 semester credits*

INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 735

## **Seminar in Data Warehousing and Mining**

The course will provide students with fundamental concepts in building a large scale database system in conjunction with knowledge acquired from the Database Organization and Management (ITKM 654) course. The course will introduce major data storage tools useful in data mining such as data warehousing, data mart and OLAP (On-Line Analytic Processing), then discuss the relevant theories and concepts relating to data mining and its applications. This course re-

quires extensive involvement from students. Prerequisites: ITKM 654 and completion of all required Information Technology and Knowledge Management required concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 747

## **Advanced Business Programming**

This course is an extension of ITKM 656 (Business Programming with Visual Basic .Net) to expose students more advanced programming skill that are actually practiced in real business world such as database and internet programming using object-oriented approach. Through the course, students will learn how to build flexible, fast, and scalable data access objects and applications using the ADO.NET data access technology. In addition, the course covers and discusses building web applications with web forms, creating custom controls for Windows Forms and Web Forms, and finally, creating and consuming Web Services. Prerequisites: ITKM 600 and ITKM 656 and completion of all required Information Technology and Knowledge Management required concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

INFORMATION SYSTEMS  
AND KNOWLEDGE MANAGEMENT 749

## **Decision Support Systems**

Decision Support Systems (DSS) are interactive computer based systems that help decision makers understand and use data, models, and other analytical tools to evaluate their options. The course will focus on several aspects of DSS. Topics covered include Data-Driven systems, Model-Driven systems and Communications-Driven systems that help groups solve problems and Knowledge-Driven systems, and Document-Driven systems (expert systems). This course will enhance the student's ability to understand the design and development of DSS with Web technology. Prerequisites: Completion of all required Information Technology and Knowledge Management required concentration courses or concurrent registration in final required concentration courses. Prerequisites for Operations: MGMT 650 and completion of required Operations concentration courses or concurrent registration in final required concentration courses.

*3 semester credits*

# Information Systems and Knowledge Management • Instructional Technology

## INFORMATION SYSTEMS AND KNOWLEDGE MANAGEMENT 760

### **Information Technology Security**

This course covers the fundamentals of information technology security including threat and risk management, impact analysis and mitigation strategies. It identifies the major causes of threats (e.g., natural and man-made) and develops contingency and disaster prevention and recovery plans. It discusses information technology continuity plans and strategies. It deals with physical, cyber and personnel security. It also defines the overall responsibilities for the protection of an organization's information technology assets. Prerequisites: Completion of all required Information Technology and Knowledge Management required concentration courses or concurrent registration in final required concentration courses. Otherwise, permission of Assistant Dean is required.

*3 semester credits*

## INFORMATION SYSTEMS AND KNOWLEDGE MANAGEMENT 762

### **Enterprise Information Systems**

This course will examine the role of information systems in business and how they provide the information required by management. Modular, best of breed, and other systems strategies and configurations, as well their managerial implications will be examined. The course is case-based and provides the student hands-on experience learning and utilizing Sage Software's MAS200 ERP system to complete case problems. Other enterprise systems will be discussed as well, including SAP and Oracle. Prerequisites: Completion of all required Information Technology and Knowledge Management required concentration courses or concurrent registration in final required concentration courses. Otherwise, permission of Assistant Dean is required.

*3 semester credits*

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## **Instructional Technology**

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## INSTRUCTIONAL TECHNOLOGY 600

### **Cognitive Foundations of Education**

Cognitive Foundations of Education

This course explores cognitive models of understanding, learning and memory, with applications to instruction. Students will use cognitive and neural net models to design learning environments, and examine the ef-

fects of using various technologies on cognition and performance improvement.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 605

### **Instructional Systems Design**

Examines strategies, trends, issues and research findings related to the design and development of standards-based instructional systems and programs. Focuses on both behavioral and cognitive strategies for instructional design including the theory and research background related to each approach. Students will apply these strategies in assessment of needs, analysis, design, development, management and evaluation of an instructional system or program. Requires development of an instructional program or unit for a teaching or training application.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 606

### **Technology, Methods and Materials**

Covers technology-enhanced instructional methods and curriculum development. Students will create a unit plan consisting of a set of lessons that integrate the use of technology in teaching and learning. Also cover fundamentals of classroom management.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 610

### **New Technologies for Learning 1**

Covers creation of learning objects, including text, raster/vector graphics, animations, slideshows, conferencing components, and videos for instructional Webs. Use of digital image capture equipment, including digital cameras, camcorders, and scanners. Also covers basic HTML, PDF and OCR. Final project will be integration of elements into an instructional Web.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 615

### **New Technologies for Learning 2**

A continuation of New Technologies for Learning I, completing coverage of learning objects and introducing their utilization in the implementation of instructional systems. Students will complete projects via integration of components using high-level authoring systems and programming.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 617

### **Visually Enhanced Curriculum Development**

An introduction to the principles of visualization for the creation and enhancement of

both screen-based and paper-based instructional materials. Using a digital tablet accessory or integrated screen tablet, students will work with image editing software to develop digital drawing, painting, composition, and layout techniques. Project work culminates in an integrated set of visually enhanced instructional resources.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 618

### **Audio Enhanced Curriculum Development**

An introduction to the principles of audio for the creation and enhancement of classroom ambiance, instructional presentations, and interactive instructional materials. Using audio and midi recording/editing software, students will develop techniques for the creation, editing, and embedding of voice segments, sound effects, and music sequences. Project work culminates in an integrated set of audio enhanced instructional resources.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 620

### **Multimedia Curriculum Development**

An introduction to multimedia authoring for classroom and/or training applications using Flash. Students will collaborate on the development of a graded sequence of laboratory projects, and then produce a unique presentation suitable for use in their instructional setting.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 625

### **Digital Video for Instruction**

A practical introduction to digital video and its applications in instruction. Topics include capture technologies, camera techniques, non-linear editing, effects, sound engineering, lighting, pre/post-production, and distribution.

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 630

### **Networks and Distributed Learning Systems**

Covers concepts, security, acceptable use, and applications of client-server, peer-to-peer, and wireless networks in distributed learning environments. Hands-on activities utilize standard open source network operating system solutions (Linux/Moodle).

*3 semester credits*

## INSTRUCTIONAL TECHNOLOGY 631

### **Cyber Ethics and School Law**

Examine the rights and responsibilities of teachers and students as they interact in

# Instructional Technology • Management

the world of technology. Course content includes: privacy on the internet, spamming, protecting children, copyright law, cryptography issues, causing personal harm through the internet as well as harassment in cyberspace. Covers the effect of the IDEA and ADA and other legislated mandates, including Title 17 – The Children’s Internet Protection Act on teachers in the classroom. Issues of diversity (learning, cultural, linguistic, gender, sex, etc.) in relation to the law, technology, and classroom teaching are discussed and strategies of dealing with these issues are developed. Students will demonstrate their ability to use Lexis/Nexis as a resource and search tool.

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 633

## **Administrative Computing Applications**

Covers applications of computers in public school central and district office operations, and independent schools. Topics include budget and equipment management, payroll, grades, scheduling, billing, school store, admissions, networks, development, integrated and distance learning systems, project management, distributed file management, and data warehousing. Use of decision support systems and what-if analysis for strategic planning is also addressed..

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 640

## **Graphical User-Interface Design**

A survey of proven strategies for improving the human computer interface and usability in instructional systems. Topics include usability testing, interface building tools, direct manipulation and virtual environments, menu selection and form fill-in, command and natural languages, interaction devices, response time and delay, presentation style, window management strategies, help and tutorial systems, and visualization.

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 645

## **Intelligent Tutoring Systems**

This course covers the utilization of intelligent tutoring systems (ITS) in instruction. Topics include procedural and declarative knowledge representations, learner domains, teacher strategies, and implementations using a high-level, easy-to-use popular ITS authoring tool.

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 650

## **Internet Programming**

An introduction to the creation of dynamic Web sites for educational and training applications. Covers forms processing using bots and CGI, Java/VB, scripts, ASP, multimedia using Flash and animated GIFs, and dynamic HTML.

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 655

## **Animation and Simulation for Instruction**

Covers principles of computer animation and simulation for instructional applications. Topics include 2D/3D foundations, model creation and character design, special effects, logo animation, scene design, motion study, and control.

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 670

## **Computer Maintenance and Help Desk**

Covers technology support and remedies for the most common PC malfunctions. Students will disassemble and reconstruct PCs in the Academic Computing Classroom to gain familiarity with system components. Also covers technical support and basic Help Desk functions, including end-user support, strategies for local and remote diagnosis of hardware and software problems, and policies fair use and maintenance.

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 680

## **Adaptive Technologies**

An introductory course to expose students to a variety of technologies used by and with persons with exceptionalities. Students will gain hands-on skills in designing technology-based instructional materials for students with a wide range of exceptionalities. A focus on Universal Design for Learning is at the core of this course—with a goal of providing students with the ability to adapt technology, instruction, and assessment to meet a range of student needs. Exposure to adaptive and assistive technologies, as well as state-of-the-art software and hardware, will take place during the course.

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 685

## **Research Methods and Thesis**

This course presents a systematic survey of research principles, methods and practices in educational and learning technologies. Content will focus on the role of research

in acquiring and disseminating information, methods of constructing hypotheses, developing research designs and selecting procedures for observation and measurement. Other topics include reviewing evaluation studies, understanding different approaches to educational research, analyzing data, and writing a research proposal.

*3 semester credits*

INSTRUCTIONAL TECHNOLOGY 690

## **Practicum**

This course is a structured field experience in a public school. The goals of the course are to facilitate the student’s awareness of self, of school pupils, and of prospective teachers. The course is an elective for other majors. The number of semester hours taken will be determined with the student’s advisor.

*3 semester credits*

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## **Management**

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MANAGEMENT 600

## **Leadership and Management**

The purpose of this course is to introduce students to the primary tenets of leadership and management. Successful organizations foster both innovation and efficiency. Students will evaluate the different dynamics related to realizing organizational progress through the effective and efficient use of talent, structure, culture, methods, and technology. In addition to the required textbooks, students will be required to research industry journals as a way to evaluate the application of leadership and management techniques in real settings across various industries. Prerequisites: Admission to graduate study.

*3 semester credits*

MANAGEMENT 610

## **Organizational Behavior**

This course permits students to examine both theory and practice of interpersonal, team and organizational behavior. Individual and small group projects develop and illustrate principles of relationships, communications, role assignment, leadership and conflict management in organizations. Experiential designs permit learning through group participation, case analysis and individual problem solving. Prerequisites: MGMT 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

# Management

## MANAGEMENT 611

### **Human Resources Management**

This course is an in-depth survey of current theory, research and practice in the management of human resources in organizations. Job design, recruitment, selection, performance feedback, goal-setting, training, employee rights, safety, compensation and benefits issues are reviewed within the context of their application in the United States as a world standard for such practices, with comparisons to customs and practices in the international arena. Intensive research into current human resource topics is required. Prerequisites: MGMT 600, MGMT 610 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

## MANAGEMENT 632

### **Global Program and Project Management**

This course focuses on the managerial aspects of how to effectively manage, plan and execute programs/projects with a focus on high quality deliverables arriving on time, within budget, within scope and to the customer's satisfaction. Areas covered will include program and project management life cycle phases, executive sponsorship, portfolio investment management selection and prioritization, requirements, scope and project charters, planning, development, estimating, staffing, leadership, scheduling, risk management, change management, project metrics, vendor integration and management and other related topics. This course is based on current and emerging best practices and principles. Project Management certification requirements and real world case studies are discussed. Prerequisites: MGMT 600, MGMT 610 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

## MANAGEMENT 640

### **Assessment**

This course focuses on workplace assessment related to recruitment, placement, and workplace training. Performance appraisal is emphasized including employee development, development of objectives and process, monitoring, retention and separation. The understanding of selection and assessment instruments and methodology are studied as well as the statistical analysis required for psychometric assessment. Prerequisites: MGMT 600, MGMT 610 and completion of

all core courses or concurrent registration in final core courses. Normally students take MGMT 611 before MGMT 612.

*3 semester credits*

## MANAGEMENT 650

### **Foundations of Business Process and Operations Management**

The student is introduced to process management methods which are fundamental to delivery of products and services. Topics covered include capacity analysis and planning, inventory management, design of jobs for quality and cost effectiveness, demand forecasting, work flow management, queuing theory, project management and total quality management. Prerequisites for Operations Major: MGMT 600 and completion of all core courses or concurrent registration in final core courses. Prerequisites for Management Major and Human Resources Management Major: MGMT 600 and completion of required major courses or concurrent registration in final required major courses.

*3 semester credits*

## MANAGEMENT 652

### **Foundations of Business Process and Operations Management**

This course focuses on the development of the entrepreneurial spirit and develops specific skills to fulfill plans that develop from that creative and persevering spirit. Many different aspects of entrepreneurial ability will be emphasized including a strong work ethic, leadership, team building and the development of business relationships. The course also covers the growth of an existing business through entrepreneurship. Students will conceive, develop and present a comprehensive business plan intended to obtain external financial support or internal organizational support. Prerequisites for Small Business and Entrepreneurship Major: MGMT 600 and completion of all core courses or concurrent registration in final core courses. Prerequisites for Management Major: MGMT 600 and completion of required Management Major courses or concurrent registration in final required Major courses.

*3 semester credits*

## MANAGEMENT 654

### **Small Business and Entrepreneurship**

This course focuses on the development of the entrepreneurial spirit and develops specific skills to fulfill plans that develop from

that creative and persevering spirit. Many different aspects of entrepreneurial ability will be emphasized including a strong work ethic, leadership, team building and the development of business relationships. The course also covers the growth of an existing business through entrepreneurship. Students will conceive, develop and present a comprehensive business plan intended to obtain external financial support or internal organizational support. Prerequisite: MGMT 652 This course is intended for students in their next to last semester of study.

*3 semester credits*

## MANAGEMENT 656

### **Small Business Practicum II: Management, Operations and Marketing**

The course is a hands-on course that provides the concepts and practical tools needed to start a small business. The course offers instruction in accounting concepts specific to small businesses experience with accounting software. Understanding of financing opportunities including bank loans and venture capital will enable the student to obtain financing for a small business. Students will also study basic financial management principles relevant to small business. The course also focuses on setting up the legal structure for the business by enabling the student to choose the appropriate organizational form and to study the regulatory and employment laws specific to small businesses. Prerequisite: MGMT 654 This course is intended for students in their next to last semester of study.

*3 semester credits*

## MANAGEMENT 712

### **Organizational Development**

The course is a hands-on course that provides the concepts and practical tools needed to start a small business. The course offers instruction in accounting concepts specific to small businesses experience with accounting software. Understanding of financing opportunities including bank loans and venture capital will enable the student to obtain financing for a small business. Students will also study basic financial management principles relevant to small business. The course also focuses on setting up the legal structure for the business by enabling the student to choose the appropriate organizational form and to study the regulatory and employment laws specific to small businesses. Prerequisites: MGMT 610 and completion of all re-

# Management

quired Management Major courses or concurrent registration in final required major courses.

*3 semester credits*

MANAGEMENT 722

## **Conflict & Negotiation**

The development of conflict-management and negotiating skills are taught in this course with particular emphasis on achieving effective and efficient outcomes within a global and multicultural context. Experiential exercises, readings and discussions will demonstrate various strategies for a broad range of negotiating scenarios, e.g., buyer-seller, management-labor, personal salary increase, etc. Prerequisites for Management Major or Human Resources Management Major: MGMT 600 and MKTG 600 and completion of all required major courses or concurrent registration in final required Major courses.

Course is cross-listed with MKTG 722.

*3 semester credits*

MANAGEMENT 723

## **Leadership, Teams and Managing Change**

This course focuses on the development of leadership skills important in the effective management of change. Through role-playing exercises, videotapes, diagnostic tools, seminar discussion, selected readings, and a group project, students will learn theory and build interpersonal skills necessary for providing leadership in diverse multicultural groups and organizations. The course will address the managerial issues present in organizations undergoing accelerating change and adopting a culture of creativity. Creating and sustaining high performance multi-cultural and interdisciplinary traditional and virtual teams is covered. Prerequisites for Management Major or Human Resources Management Major: MGMT 610 and completion of all required major courses or concurrent registration in final required major courses.

*3 semester credits*

MANAGEMENT 725

## **Counseling**

The course surveys counseling theory, counseling strategies, and appraisal procedures. The purpose is to enable the human resources manager to identify potential employee problems such as addiction, mid-life issues, and psychological disorders. This training will facilitate the ability of the manager to refer employees for professional counseling and

intervention. There will also be emphasis on resolving workplace interpersonal conflicts. Prerequisite: MGMT 610 and completion of all required Human Resources Management Major courses or concurrent registration in final required major courses.

*3 semester credits*

MANAGEMENT 733

## **Strategic Information Systems**

The primary objective of the course is to develop an understanding of the need to construct Operations and Information Systems Strategies that support corporate level strategies and simultaneously coordinate with other functional level strategies. An emphasis will be placed on cross-functional decision making in Finance, Operations and Marketing. The central focus of the course will be operations strategy aligning with current information systems and technologies. Information systems strategy decisions will be discussed as they relate to operations and the integration of operations with other functional areas. Prerequisites: Completion of Management or Information Technology or Knowledge Management required major courses or concurrent registration in final required major courses.

*3 semester credits*

MANAGEMENT 734

## **Strategic Sourcing and Vendor Management**

This course covers the rewards and risks of outsourcing and vendor management and identifies where outsourcing should be used and not used. The objectives of the course are to help students understand how to plan, direct, manage and more effectively participate in outsourcing initiatives in terms of the feasibility of outsourcing (off-shore, near-shore, rural-shore, best shore), vendor selection, contract negotiation, vendor management and evaluation, risk assessment and terminating outsourcing deals. Prerequisites for Management Major or Operations Major: MGMT 610, MGMT 650 and completion of required major courses or concurrent registration in final required major courses.

*3 semester credits*

MANAGEMENT 740

## **Advanced Business Process and Operations Management**

Students in this course apply the methods from MGMT 650 to projects of their own design and choosing, employing systems

designed for application to process management issues. Emphasis is put on quantitative problem-solving and decision-making processes applied by the professional manager for the improvement of product or service development quality and customer satisfaction. Business process improvement techniques such as lean and Six Sigma will be covered. Prerequisites for Management Major or Operations Major: MGMT 610, MGMT 650 and completion of required major courses or concurrent registration in final required major courses.

*3 semester credits*

MANAGEMENT 742

## **Strategic Sourcing and Vendor Management**

This course examines the somewhat recent economic evolution from a primarily manufacturing model to a more information driven economy with an emphasis on the impact of these changes on professional careers. Students will review and assess the primary attributes of IT, such as data management and software as a way to evaluate the potential role of technology in administering professional activities. In the final module, students will develop a personal strategy by reflecting on their individual attributes as a way to further develop their unique talents in the workplace. Prerequisites for Management Major and Operations Major: MGMT 610, MGMT 650 and completion of required major courses or concurrent registration in final major required courses. Students may take MGMT 742 or MGMT 744 but not both.

*3 semester credits*

MANAGEMENT 744

## **Society and Technology**

This course examines the complicated relationship between society and technology. The coursework will review the role technology has played in human development in areas, such as commerce, the environment, politics, warfare, health, and wealth distribution. Students will evaluate the holistic impact of these applications with an emphasis on moral issues, such as balancing the need for progress with the need for social justice. Students will also explore the possibilities and challenges related to emerging technological innovation. Prerequisites for Management Major or Operations Major: MGMT 610, MGMT 650 and completion of major required courses or concurrent registration in final major required courses. Students may

# Management • Marketing

take MGMT 742 or MGMT 744 but not both.  
*3 semester credits*

MANAGEMENT 750

## **Foundations of Doing Business in China**

The course provides the fundamental knowledge of how to do business in China. It covers the economic, financial (tax), political, cultural, regulatory, infrastructure, environmental, marketing, trade, labor force and education system, demographic and technology issues, trends and practices. It identifies the various trade agreements and their implications in doing business in China or with Chinese organizations. It also exposes students to U.S. federal, state and local government resources available to help establish business and trade relationships in China. Prerequisites for Management Major and Operations Major: MGMT 610 and completion of major required courses or concurrent registration in final major required courses.

*3 semester credits*

MANAGEMENT 751

## **Foundations of Doing Business in India**

The course provides the fundamental knowledge of how to do business in India. It covers the economic, financial (tax), political, cultural, regulatory, infrastructure, environmental, marketing, trade, labor force and education system, demographic and technology issues, trends and practices. It identifies the various trade agreements and their implications in doing business in India or with Indian organizations. It also exposes students to U.S. federal, state and local government resources available to help establish business and trade relationships in India. Prerequisite: Completion of International Business Major required courses or concurrent registration in final major required courses.

*3 semester credits*

MANAGEMENT 760

## **Foundations of Healthcare Management and Administration**

This course focuses on a systematic exploration of the health care system in the United States, government interactions and regulations, delivery systems, healthcare insurance and financing, health care providers, innovations in healthcare services and alternative strategies. Prerequisite: Completion of required Management required Major courses or concurrent registration in final required major courses.

*3 semester credits*

MANAGEMENT 771

## **Foundations of Service Management and Engineering**

With the rapid growth of the services industry, this course integrates topics from economics, engineering, law, technology and organizational theory to deal with how firms change over time to become more service oriented or become service business and the mechanisms and tools by which they seek innovation and competitive advantage in the service sector. The services life cycle is reviewed. In addition, enabling technologies and how different disciplines help to answer questions about how business services combine, evolve, standardize and mature are covered. Prerequisites for Management Major or Operations Major: MGMT 610, MGMT 650 and completion of required major courses or concurrent registration in final required major courses.

*3 semester credits*

MANAGEMENT 779

## **Foundations of Service Management and Engineering**

This course focuses on current international issues that affect business operations at home and abroad. Changing business environments are discussed and analyzed. Students are required to formulate new global business strategies in light of emerging international trends and events. In some cases students may supplement their study by field trips and on-site analysis. Prerequisite for International Business Major: Completion of required major courses or concurrent registration in final required major courses.

*3 semester credits*

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## **Marketing**

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MARKETING 600

### **Marketing**

The course will explore the process of planning and executing the conception, pricing, promotion and distribution of ideas, goods and services, to create exchanges that satisfy individual, organizational, and societal objectives. The underpinnings of the marketing discipline will be taught through text, case, articles and class discussion. Mastery of these principles will come through a variety of individual and group assignments to create marketing solutions for real-world products.

Prerequisite: Admission to graduate study.  
*3 semester credits*

MARKETING 610

### **Business Research**

Students will study the basic concepts and tools of business research. The purpose is to give students an understanding of basic research that will enable them to utilize and conduct research for any business area. Consequently, there is a focus on scientific method principles including sampling, survey instruments, experimental design, scientific procedures, statistical analysis, and analyzing results both quantitatively and qualitatively. Effective methods for organization and reporting of research results are studied and put to practice by the student. The use of secondary sources, data bases and library research techniques will be presented. Prerequisite: STAT 600 and completion of all core courses or concurrent registration with final core courses.

*3 semester credits*

MARKETING 612

### **Customer Analysis**

This course will take up special topics in customer behavior utilizing knowledge not only from research on consumer behavior but from a variety of disciplines including psychology, sociology and anthropology. The leading models of customer behavior in both industrial and consumer settings will be analyzed. The qualitative and quantitative marketing research tools necessary to understand buyer behavior dynamics in any market will be stressed. Prerequisite: MKTG 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

MARKETING 620

### **Strategy and Advanced Marketing Concepts**

This course focuses on advanced topics in strategy, marketing research, promotion, pricing, supply chain management and product development and management. The focus on strategy will enable the student to develop competitive advantage through the enhancement of customer value. The course explores specific topics in marketing beyond those learned in the introductory marketing course. The purpose is to provide all students with an in depth understanding of the marketing concepts through lecture, case analysis and team projects. Prerequisite:

# Marketing

MKTG 600, MKTG 612 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

MARKETING 650

## **Global Market Management**

This course analyzes strategy, planning, implementation and control for market entry and development. Topics include social, political and economic changes affecting marketing opportunity; focused versus dispersed marketing efforts; marketing in developed and undeveloped countries; and marketing systems required for the various strategic alternatives. The focus will be on creating competitive advantage in the global marketing environment. Prerequisite for Marketing Major: MKTG 600, MKTG 610 and completion of all required Marketing Major courses or concurrent registration in final required Major courses. Prerequisite for International Business Major: MKTG 600 and completion of all core courses or concurrent registration in final core courses.

*3 semester credits*

MARKETING 710

## **Marketing Research**

This is an advanced course in marketing research theory and application. The purpose is to provide the student with an in-depth understanding through the application of research concepts with hands-on projects. The student will design and implement survey and experimental designs. Advanced approaches to sampling target populations, designing survey instruments, utilizing the best statistical analysis, and analyzing resultant data both quantitatively and qualitatively are explored in this course. Effective methods for organization and reporting of research results are studied and put to practice by the student. Prerequisite: MKTG 610 and completion of all required Marketing Major courses or concurrent registration in final required Major courses.

*3 semester credits*

MARKETING 720

## **Electronic and Mobile Business**

The goal of this course is to prepare current and future executives, managers, and strategists to be leaders and create value in the New Economy – to gain understanding and insight on how the functions of management and marketing in the New Economy

have changed as well as how new technology and media forms have created a radically different business environment. The course examines the impact of the evolving virtual worlds of Internet and mobile commerce on the strategy of traditional “brick-and-mortar” companies. Up-to-date information will be utilized from current publications to provide the student with the ability to work in the new wireless world. This new business frontier requires most firms to significantly change their business strategy and presents unprecedented new opportunities for fast acting entrepreneurs. Prerequisites for Information Technology and Knowledge Management: MKTG 600, ITKM 600, and completion of all required Information Technology and Knowledge Management Major courses or concurrent registration in final required Major courses. Prerequisites for Marketing: MKTG 600, ITKM 600, and completion of all required Marketing Major courses or concurrent registration in final required Major courses. Course is cross-listed with ITKM 720.

*3 semester credits*

MARKETING 722

## **Conflict and Negotiation**

The development of conflict-management and negotiating skills are taught in this course with particular emphasis on achieving effective and efficient outcomes within a global and multicultural context. Experiential exercises, readings and discussions will demonstrate various strategies for a broad range of negotiating scenarios, e.g., buyer-seller, management-labor, personal salary increase, etc. Prerequisites for Marketing Major: MGMT 600 and MKTG 600 and completion of all required Marketing Major courses or concurrent registration in final required Major courses. Course is cross-listed with MGMT 722.

*3 semester credits*

MARKETING 725

## **Data Mining and Data-Driven Marketing**

This course enables the student to use data to make marketing management decisions. The student will learn to use statistical tools and analytical techniques to transform data into useful information that will result in the development of segmentation, targeting and positioning of marketing mixes that create additional customer value and enhance organization competitiveness. Hands-on experience with the tools and techniques will be valuable to students as they pursue a market-

ing career. Prerequisites: MKTG 610, MKTG 612 and completion of all required Marketing Major courses or concurrent registration in final required Major courses.

*3 semester credits*

MARKETING 729

## **Game Theory and Strategy**

The course examines the theoretical and applied value of game theory for businesses. The purpose is to enable the student to understand the strategy and tactics relevant to many different power relationships. It utilizes the 2 by 2 game matrix to understand the interdependence of outcomes and the domain of possible types of relationships. Buyer-seller relationships and competitive strategies will be analyzed. Prerequisite: MKTG 610 and completion of all required Marketing Major courses or concurrent registration in final required Major courses.

*3 semester credits*

MARKETING 740

## **Customer Relationship Management**

This course emphasizes the long term organizational value of developing relationships with customers. The first focus is on the use of data to provide increased value for the firm. Students will understand how to create value for the customer with a systematic analysis of customer needs. The second focus on the nature of interpersonal relationships in a business setting that develops long lasting business relationships. Prerequisite: MKTG 610, MKTG 612 and completion of all required Marketing Major courses or concurrent registration in final required Major courses.

*3 semester credits*

MARKETING 747

## **Personal Sales and Sales Management**

The purpose of this course is to develop the student's ability to engage in real world professional sales and sales management. The foundation of personal sales is to be able to communicate effectively in both one-on-one sales situations and in group presentation situations. Psychological theory related to persuasion and interpersonal relationships will be used to provide the foundation for specific sales techniques. Practical experience in persuading, prospecting, negotiating, referrals, closing the transaction, and responding to buyer concerns will be utilized. The course will also focus on the management of a sales force including methods of compen-

## Marketing • Mathematics

sation, motivation, hiring and retaining sales people, and the legal and ethical aspects of selling. Prerequisite: MKTG 610, MKTG 612 and completion of all required Marketing Major courses or concurrent registration in final required Major courses.

*3 semester credits*

MARKETING 751

### **Product Management, Innovation and Commercialization**

This course covers new product development, innovation and commercialization, as well as the product management life cycle. Topics covered include the feasibility and investment prioritization of new products or product enhancements, raising capital for new product development, market and customer needs analysis, make versus buy alternatives and product launch and commercialization issues and considerations, including promotion, pricing, distribution, competition, pre and post sales support, systems and infrastructure support, customer service and related areas. Student will work on individual and team projects that will include the development of a new product market/business plan. Prerequisite for Marketing: MKTG 600, MKTG 610 and completion of all required Marketing Major courses or concurrent registration in final required major courses. Prerequisite for Management: MKTG 600, MKTG 610 and completion of all required Management Major courses or concurrent registration in final required major courses. Prerequisite for International Business: MKTG 600, MKTG 610 and completion of all required International Business Major courses or concurrent registration in final required major courses.

*3 semester credits*

MARKETING 752

### **Services Marketing**

The course addresses the unique problems of marketing intangibles in the broad spectrum of service industries which are an increasing part of U.S. and world industry. The course focuses on the development, implementation and control of strategy, systems and people for effective service operations. The course uses case studies, additional readings and lecture to enable the student to pursue a career in the services industry. Prerequisite: MKTG 600, MKTG 612 and completion of all required Marketing Major courses or concurrent registration in final required major courses.

*3 semester credits*

MARKETING 754

### **Supply chain Management and Logistics**

The course focuses on the management of material and goods outside of the factory. A variety of topics will be pursued including country sourcing, forecasting, distribution system design, order fulfillment, channel relationships, inventory deployment, and procurement. Students will understand the problems associated with supply chain integration within an organization and between organizations. The impact of the internet and the dynamically changing technology including virtual chains and logistics will be examined. Cases will be used to understand the competitive advantage created by integrated, low cost supply chains. Prerequisite: MKTG 610 and completion of all required Marketing Major courses or concurrent registration in final required Major courses.

*3 semester credits*

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## Mathematics

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MATHEMATICS 401

### **Advanced Analysis for Scientists and Engineers I**

Partial differential equations, Bessel functions, Legendre polynomials. Fourier series, boundary and initial value problems, topics in vector analysis, tensor analysis. Prerequisite: Math 301 (Differential Equations). One semester of advanced calculus strongly recommended.

*3 semester hours*

MATHEMATICS 402

### **Advanced Analysis for Scientists and Engineers II**

Functions of a complex variable, conformal mapping, calculus of residues, operators. Prerequisite: Math 301 (Differential Equations). One semester of advanced calculus, or permission of the instructor.

*3 semester hours*

MATHEMATICS 403

### **Functions of a Complex Variable I**

The general theory of functions of a complex variable. Complex algebra, analytic functions and their mappings, complex integration, infinite series, Taylor and Laurent expansion, isolated singularities, residue theory. Prerequisite: One year of advanced calculus.

*3 semester hours*

MATHEMATICS 404

### **Functions of a Complex Variable II**

Continuation of Mathematics 403. Additional

topics include insofar as time permits, harmonic functions, conformal mapping and applications, normal families. Riemann mapping theorem, analytic continuation, Riemann surfaces, infinite products, entire functions. Prerequisite: Math 403.

*3 semester hours*

MATHEMATICS 407

### **Introduction to Modern Analysis**

Metric Spaces, sequences and series, continuity differentiation, Riemann-Stiejes integral, functions of several variables.

*3 semester hours*

MATHEMATICS 411 & 412

### **Introduction to Applied Mathematics 1 & 2**

Introduction to Hilbert Space, Fourier Series, calculus of variations, boundary value problems, Green's functions and integral equations.

*3 semester hours*

MATHEMATICS 414

### **Numerical Analysis**

Interpolation, numerical differentiation and integration, numerical solution of differential equations, least squares, error analysis. Prerequisite: Math 215 (Calculus and Analytic Geometry III) or equivalent. Math 301 (Differential Equations) strongly recommended.

*3 semester hours*

MATHEMATICS 415

### **Advanced Numerical Analysis**

Convergence, numerical stability, round off error, truncation error arising from the approximation of differential and integral equations.

*3 semester hours*

MATHEMATICS 423

### **Mathematical Statistics I**

Probability theory, discrete and continuous distributions, transformations, moment generating functions, characteristic functions, central limit theorem, sampling distributions. Prerequisite: Math 215 (Calculus and Analytic Geometry III) or equivalent.

*3 semester hours*

MATHEMATICS 424

### **Mathematical Statistics II**

Continuation of Mathematics 423. Additional topics include estimation, testing of hypothesis, confidence intervals, regression, and analysis of variance. Prerequisite: Math 423 or Math 323.

*3 semester hours*

## Mathematics • Mechanical Engineering

MATHEMATICS 431

### **Introduction to Topology and its Application**

Elements of point set theory; introduction to topological spaces including metric spaces; separation and countability axioms; connectedness; compactness; completeness. Prerequisite: One year of advanced calculus.

*3 semester hours; offered as needed*

MATHEMATICS 451

### **Linear Algebra and Matrix Theory I**

Linear vector spaces, bases, dimension, inner product, norm, orthogonality. Linear transformations, matrices, matrix algebra, Hamilton-Cayley Theorem, eigenvalues and eigenvectors, rank. Prerequisite: Math 391 (Modern Algebra) or equivalent.

*3 semester hours*

MATHEMATICS 453

### **Modern Algebra I**

Groups, rings, fields, ideals, polynomials. Prerequisite: Math 391 (Modern Algebra) or equivalent.

*3 semester hours*

MATHEMATICS 454

### **Modern Algebra II**

Continuation of Math 453. Modules, field extensions, Galois theory, real fields, special topics. Prerequisite: Math 453.

*3 semester hours*

MATHEMATICS 480

### **Selected Topics in Mathematics**

Current topics in applied mathematics topics will be selected from specific disciplines as a focus for intense study. Current topics in Physics, Chemistry, Biology and Computer Science will be offered on a semester basis. The course may be repeated as long as topical focus changes.

*3 semester hours*

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## Mechanical Engineering

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MECHANICAL ENGINEERING 407

### **Modern Materials and Advanced Manufacturing Technologies**

This course focuses on the study of modern industrial materials and the process of developing creative solutions through conceptual analysis and synthesis on different advanced and automated manufacturing processes. The course will help students to learn the emerging topics in the material and manufacturing

industries. The topics cover the study on today's popular industrial materials, material selections and industrial applications, and their related manufacturing techniques in US industry. Topics also include the introduction of quality control (QC) process that is important to the production with the high quality. The course has two class projects which will guide and help students to learn the ways of preparing for professional research and keep track of the latest technologies in modern materials, advanced and automated manufacturing processes. Pre-requisites: Engineering 111, Mechanical Engineering 223.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 410

### **Advanced Fluid Dynamics**

Advanced topics in applied fluid mechanics. Review of continuity, momentum, and energy equations for viscous, incompressible fluid; voracity and circulation concepts and theorems. Selected topics from the following areas: Complex potential, conformal mapping and applications. Airfoil and wing theory. Boundary layer theory; similarity solutions for laminar flows, integral techniques for turbulent flows. Compression and expansion waves in compressible flows; oblique shock waves, Prandtl-Meyer flow. Propagating waves and applications; shock tube, transients in duct systems. Pre-requisite: Undergraduate Fluid Mechanics, Mechanical Engineering 309.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 421

### **Computer Aided Engineering Design**

This course applies 3-D CAD system e.g., Pro E to industrial product and system design. These CAD systems are very practical and powerful 3-D CAD tools and they have been widely used in the industry. The first half of the class focuses on learning fundamentals of the 3-D system, its popular applications and its related techniques. The special topics of design concept are also included. The second half covers several practical projects. Students will combine the design techniques with the real project and use 3-D tools to design the product or part of industrial system. All projects will be presented by students in class. Pre-requisites: Engineering 111, Physics 111.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 422

### **Advanced Computer Aided Project Design**

This advanced course focuses on some hot and

very practical topics in today's industrial design applications. Also, some useful knowledge, such as PLC (Program Logic Control), calculation and selection of industrial motors, fundamentals of automation, sensor technology, and selection of material on different industrial applications are included. Several more complicated projects in this class will help students learn how to manage the different engineering projects and understand all related design issues which will improve the future production and manufacturing process. Pro-E will be used as a 3-D CAD tool to design these advanced engineering projects. All projects should be presented by students in the class. Pre-requisites: Mechanical Engineering 421.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 423

### **Computer Aided Manufacturing (CAM) and NC Machining**

This course applies manufacturing and various numerical controlled software for designing computer-aided manufacturing and NC machining systems, processes and algorithms. This course is heavy in implementation of various manufacturing technologies and programming of NC machines. Pre-requisites: Engineering 111, Physics 111, Mechanical Engineering 421.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 424

### **Advanced CAM & Automation.**

This course teaches students to simulate advanced manufacturing processes by learning high level functions in Pro-Engineer/Pro-Manufacturing software package. This course will cover the topics of some advanced and special manufacturing technologies, including laser cutting & welding, water jet cutting & cleaning, and plasma cutting & welding. Automation related topics will also be introduced, including the analysis and application of PLC control systems in manufacturing facilities and modern production systems. Several advanced and real projects will help students to be proficient in using this CAD/CAM package and learn more of US industrial & engineering knowledge through the instructor's lectures & guidance and also the students' self-motivated work.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 429 (MEEG 429/ELEG 429)

### **Electronics Cooling**

This course is designed to help students

# Mechanical Engineering

understand the thermal challenges and demands of the electronics field. Fundamentals and physics of thermodynamics, heat transfer and fluid mechanics will be introduced and shown how to apply them to the design and testing of electronic hardware. The thermal characteristics and thermal failure modes of electronic components, and reliability prediction techniques will be reviewed. Numerical simulation and commercial CFD packages will be introduced for thermal analysis. Students will have a good understanding of the heat transfer and fluid mechanics principles affecting proper thermal management of electronic components and develop skills to identify potential thermal design problems and develop reliable, cost-effective solutions.

*3 semester hours*

MECHANICAL ENGINEERING 430

## **Design & Innovation**

The objective of this course is to convey a sense of Design and Innovation in the development of products. To accomplish this the class shall review a number of case studies and participate in the design of a project. In addition to the semester project we shall discuss a number of topics of concern to Design and Engineering through illustrated talks (slides/tapes) and when available with guest designers and engineers. Pre-requisites: Engineering 111, Engineering 300.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 440

## **Ergonomic Factors in Design**

This course introduces the student to the concepts of ergonomics. Ergonomics is the study of fitting the workplace and devises to the capabilities of the human worker. Students will have an understanding of the beginnings and evolution of the field of ergonomics. They will learn to recognize risk factors associated with repetitive stress disorders (e.g., carpal tunnel syndrome) and potential sprain/strain injuries as well as be familiar with the body areas affected. This course covers principles of physiology and biomechanics and how they apply to workstation and tool design. Pre-requisites: Engineering 111.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 452

## **Advanced Vibrations**

Brief review of systems with one and two degrees of freedom. Rayleigh's method. Application of Lagrangian and matrix methods

to discrete systems with many degrees of freedom; normal mode theory; vibrations of finite continua; solution methods and mathematical properties. Numerical and computer methods. Sensitivity analysis. Applications to machines and structures. Pre-requisites: Mechanical Engineering 315 or equivalent.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 453

## **Finite Element Methods in Mechanical Engineering**

Formulation of finite element characteristics using energy methods. Convergence criteria. Consistent load and mass matrices. In-plane and axisymmetric analysis using simple and higher-order triangular and quadrilateral elements. Finite element analysis of plate-bending problems. Isopara-metric concepts and formulation; applications to two-and three-dimensional stress analysis. Topics from the following areas will be chosen as time allows: buckling and vibration studies using discrete element techniques; finite element applications in fluid flow and heat transfer. Prerequisite: Mechanical Engineering 450 or permission of instructor. Pre-requisites: Basic Structural Mechanics, Math 214, Math 215, Engineering 111 or consent of instructor.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 454

## **Advanced Dynamics**

Orthogonal coordinate systems and their transformations. Particle kinematics in inertial and noninertial rotating coordinate systems. Dynamics of systems of particles and rigid bodies. Virtual work and generalized coordinates. Lagrange's equations and Hamilton's principle for holonomic and non-holonomic systems with applications. Lagrange multipliers. Prerequisites: Under-graduate Dynamics, Mathematics 301.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 456

## **Mechanics of Composite Materials**

Introduction to the mechanics of laminated filamentary composites. Prediction of stiffness and strength of laminated plates. Applications. Prerequisites: Undergraduate Strength of Materials, Mechanical Engineering 223.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 458

## **Fatigue and Fracture Mechanics**

Brittle fracture of structures, elastic stress

analysis of cracked components, static and dynamic failures, plane stress and plane strain, elastic-plastic fracture mechanics, fatigue crack growth and life prediction under constant and variable amplitude loading, environmental effects. Term work is mainly design problems and is computer oriented. Pre-requisites: Undergraduate Strength of Materials, Mechanical Engineering 223.

*3 lecture hours; 3 semester hours; 1 design semester hour*

MECHANICAL ENGINEERING 463

## **Advanced Heat Transfer**

Topics in conduction, convection and radiation heat transfer. Numerical methods, phase change, boundary layer principles, gas and solar radiation, combined heat and mass transfer. Prerequisite: Mathematics 301, Physics 209, Mechanical Engineering 208.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 479

## **CNC Machine Control and Milling**

This course introduces the CNC milling machine to students. Included are machine and shop safety, CNC coding, material selection, machine maintenance, proper use of the coolant systems and tools. Routine machine procedures and implementation are covered in preparation for several machine operations to develop student skills.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 490

## **Intellectual Property and Technology**

This course is designed for graduate students who have an undergraduate degree in Engineering, Computer Science, Mathematics, Physics, Biology, Industrial Design, etc. Students need not have any familiarity with United States law but they must be prepared to read extensively under the instructor's guidance, statutes and cases decided by the Federal and State courts. Pre-requisites: Undergraduate degree in Engineering or Sciences.

*3 lecture hours; 3 semester hours*

MECHANICAL ENGINEERING 500

## **Graduate Co-op/Internship in Mechanical Engineering**

By arrangement.

*1-3 semester hours*

MECHANICAL ENGINEERING 512

## **Computational Fluid Dynamics (CFD)**

This course is intended as an introduction to the field of computational Fluid Dynam-

# Mechanical Engineering

ics. It will help students to develop practical skills in CFD and the use of commercial CFD packages, such as FLUENT. Students will apply these skills to relevant engineering applications and gain an appreciation of the limitations and advantages of CFD modeling.

*3 semester hours*

## MECHANICAL ENGINEERING 523

### **Advanced Composite Materials**

Composite materials are ideal for structural applications where high strength-to-weight and stiffness-to-weight ratios are required. Aircraft and spacecraft are typical weight sensitive structures in which composite materials cost-effective. Usually, composite materials consist of two separate components, the matrix and the filler. The matrix is the component that holds the filler together and the filler makes the material strong. Most aerospace-application composites have strong, stiff long fibers as the fillers. The fiber makes the material behaves differently in different directions. This anisotropic behavior introduces complication in the analysis of the composite material. The course introduces the student to the basic concepts of the mechanical behavior of composite materials. Specific topics include the stress-strain relation for a lamina, micro-mechanics of composite materials, bending, buckling, and vibration of composite plates with various laminations, fatigue, fracture mechanics, and joints of composite structures.

*3 lecture hours; 3 semester hours*

## MECHANICAL ENGINEERING 530 (MEEG 530/TCMG 530)

### **Foundations of Manufacturing Management**

The objectives of the course are to understand and apply concepts and techniques in manufacturing management. The course includes the management of people (both traditional and high performance systems and teams), lean manufacturing techniques as used on the factory floor, and recent concepts such as Factory Physics. The course focuses on those issues that are important in supervising and managing a modern manufacturing operation. Prerequisites: graduate standing.

*3 semester hours*

## MECHANICAL ENGINEERING 546 (MEEG 546/TCMG 546)

### **Engineering Economics and Management**

The course covers the concepts and methods that will assist engineering and technology managers and professionals to make alternative investment and funding decisions regarding projects, programs, products, busi-

ness expansion and other alternatives using the financial calculations involving time value of money (IRR, ROI, NPV), uncertainty and risk. Topics include engineering and related financial evaluation techniques and formulas, choosing among alternatives, sensitivity analysis, economic analysis, opportunity costs, depreciation, amortization, probability, cost estimating and systems and others. Prerequisites: TCMG 484.

*3 semester hours*

## MECHANICAL ENGINEERING 562

(MEEG 562/BMEG 562/ELEG 562)

### **Nanofabrication with Soft Materials**

This is an advanced level graduate course focusing on fabrication of soft materials. Nanofabrication processes and nanosystem products will be discussed. Fundamentals associated with chips fabrications and linking them toward soft materials assembly will be detailed. Emerging nanotechnology based methods for soft and green electronics, mechanical parts, MEMS, PCBS will be covered. Gene chip, label free sensory assay using micro and nanofluidics will be discussed. Transfer printing, DNA-protein interactions using the chip and several nano-scale assemblies for soft materials fabrication will be discussed.

*3 semester credits*

## MECHANICAL ENGINEERING 570

### **Welding Engineering**

Welding is the most common method of joining materials and has been widely used in industries. This course is intended to provide knowledge of welding engineering and its application in developing and designing safe and durable welded structures.

*3 semester hours*

## MECHANICAL ENGINEERING 572

### **Production Technology and Techniques**

This course is to introduce up-to-date technology, techniques and systems of the global manufacturing industry. American manufacturing situation would be analyzed and Japanese manufacturing success is also explored. Comprehensive and readable description of manufacturing practice is researched. Prerequisites: Engineering 111, Engineering 300.

*3 semester hours*

## MECHANICAL ENGINEERING 573

### **Supply Chain Management**

The goal of this course is to cover not only high-level supply chain strategy and concepts, but also to give students a solid understanding

of the analytical tools, to understand supply chain design, planning, and operation driven the performance of a firm. It also conveys how supply chain drivers used on a conceptual level during supply chain design and operation leading to performance improvement.

*3 credits with 14 sessions*

## MECHANICAL ENGINEERING 574

### **Principles of Logistics**

This course presents materials management, logistics theory and concepts in today's manufacturing and commercial environments. It integrates all of the functional areas of the business as well as incorporating logistics into corporate operation. They are examined in light of how they interrelate with other functions for the firms. Pre-requisites: Engineering 111, Engineering 300.

*3 semester hours*

## MECHANICAL ENGINEERING 575

### **Manufacturing Strategy**

This course provides the necessary strategic perspective for manufacturing managers' sights and sustaining manufacturing excellence in the competitive manufacturing environment. The strategic perspective of manufacturing forms that the approach places these issues within the rightful context. It emphasizes the essential requirement to link with other functions in order to determine the best strategies for the business as a whole.

*3 lecture hours; 3 semester hours*

## MECHANICAL ENGINEERING 597 A

### **Master's Project**

Lecture hours and topics to be arranged with Department Chair.

*1 credit hour*

## MECHANICAL ENGINEERING 597 B

### **Master's Project**

Lecture hours and topics to be arranged with Department Chair.

*2 credit hours*

## MECHANICAL ENGINEERING 597 C

### **Master's Project (completion)**

Lecture hours and topics to be arranged with Department Chair.

*1 credit hour*

## MECHANICAL ENGINEERING 598

### **Thesis in Mechanical Engineering**

Lecture hours, semester hours and topics to be arranged.

*3-6 semester hours*

# Mechanical Engineering • Naturopathic Medicine

MECHANICAL ENGINEERING 599

## **Independent Study in Mechanical Engineering**

Independent study of advanced topics in Mechanical Engineering and submission of project report as required. Problem assignment to be arranged with and approved by the Department Chair.

*3 semester hours*

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## **Naturopathic Medicine**

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### *Basic Sciences*

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BASIC SCIENCES 511

#### **Anatomy I**

This course provides an in depth study of the macroscopic human anatomy and it covers the structure of the trunk and posterior neck. Clinical aspects of the vascular and neurological relationships of these regions will be emphasized. Instruction includes lectures and laboratories with the dissection of human cadavers and the study of bones, models and interactive multimedia software. *4 lecture hours, 3 laboratory hours; 5.5 semester credits*

BASIC SCIENCES 512

#### **Histology**

This course is the study of the normal microscopic anatomy of the body and its relationship to function at the cellular, tissue, and organ level. Included is the study of the microstructure of epithelia, connective tissue, muscle, nervous system, digestive system, circulatory, reproductive systems and the endocrine system. Where indicated, there is an integration of normal histology with physiological and clinical concepts.

*2 lecture hours, 2 laboratory hour; 3 semester credits*

BASIC SCIENCES 514

#### **Biochemistry I**

The biochemistry I lecture/lab series introduces the student to the fundamentals of protein structure, DNA replication, gene expression, transcription, and translation. Laboratory exercises require the student to apply information acquired in lecture to basic science and clinically oriented problems that are frequently encountered in practice.

*2 lecture hours, 1 laboratory hour; 2.5 semester credits*

BASIC SCIENCES 524

#### **Biochemistry II**

The biochemistry II lecture/lab series introduces the student to the fundamentals of bioenergetics. Laboratory exercises require the student to apply information acquired in lecture to basic science and clinically oriented problems that are frequently encountered in practice.

*2 lecture hours, 1 laboratory hours; 2.5 semester credits*

BASIC SCIENCES 515

#### **Physiology I**

This course is the study of physiology at the molecular and cellular level. Included is the study of the function of all major tissues and organ systems. Clinical concepts and correlations are discussed.

*3 lecture hours, 2 laboratory hours; 4 semester credits*

BASIC SCIENCES 521

#### **Anatomy II**

This course is a continuation of Anatomy I and it covers the structure of the head, anterior neck and extremities. Clinical aspects of the neurological and vascular relationships of these regions will be emphasized. Instruction includes lectures and laboratories with the dissection of human cadavers and the study of bones, models and interactive multimedia software. Prerequisites: NBS511, NBS512.

*4 lecture hours, 3 laboratory hours; 5.5 semester credits*

BASIC SCIENCES 522

#### **Microbiology**

This course covers a comprehensive overview of structure, function, growth and genetics of microorganisms. Host-parasite relationships of representative bacterial, viral, fungal and parasitic agents of human diseases are examined. An organism approach is used to survey microbial and parasitic diseases, with emphasis on modes of transmission, mechanisms of virulence, symptoms, diagnosis, treatment and prevention of associated diseases. Presentations include lecture and case studies.

*4 lecture hours; 4 semester credits*

BASIC SCIENCES 523

#### **Embryology**

This course covers the developmental process of humans from conception to birth including the formation of tissues, organs and

systems of the body, integrating histology and anatomy.

*1.5 lecture hours; 1.5 semester credits*

BASIC SCIENCES 525

#### **Physiology II**

This course is a study of the physiology at the organ and systems level and its interrelationships. Included is the study of the circulatory, endocrine, respiratory, renal, gastrointestinal, urogenital and nervous system. There is an integration of normal and pathological physiology and clinical concepts. Prerequisites: BS512, BS514, BS515.

*3 lecture hours, 2 laboratory hours; 4 semester credits*

BASIC SCIENCES 525

#### **Neuroscience**

This course covers the anatomy and physiology of the central nervous system and of the cranial nerves. The organization of cortical and subcortical motor and sensory systems including the basal ganglia, cerebellum, and the brainstem is covered as well as higher cortical functions and parcellation of function in the cerebral cortex.

*2 lecture hours; 2 semester credits*

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## *Botanical Medicine*

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BOTANICAL MEDICINE 511

#### **Botanical Pharmacy**

This course introduces the history, identification, plant taxonomy, and nomenclature of medicinal plants used by the Naturopathic Physician, while providing hands on practice in preparation and extraction of botanical medicines

*2 laboratory hours; 1 semester credit*

BOTANICAL MEDICINE 521

#### **Phytopharmacognosy**

This course is an overview of biochemical plant constituents, their interactions, energetics and synergy. Indications and contraindications of applications as well as drug/herb/supplement interactions are explored.

*1.5 lecture hours; 1.5 semester credits*

BOTANICAL MEDICINE 611

#### **Botanical Medicine I**

This course comprises a detailed survey of plants and plant preparations used in naturopathic practice, integrating traditional herbal knowledge with modern pharmacological

# Naturopathic Medicine

research. The botany and ethnobotany, folkloric Use, pharmacodynamics, phytochemistry, toxicology, and therapeutics of each plant are considered. Prerequisites: BS525  
*2 lecture hours; 2 semester credits*

BOTANICAL MEDICINE 621

## Botanical Medicine II

This course is a continuation of Botanical Medicine I. Prerequisite: BM611.

*2 lecture hours; 2 semester credits*

BOTANICAL MEDICINE 711

## Botanical Medicine III

This course covers advanced topics in botanical medicine, including materia medica, clinical applications, and current research. Prerequisite: BM621.

*2 lecture hours; 2 semester credits*

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## Clinical Nutrition

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NUTRITION 611

## Nutrition I

This course provides the foundation for therapeutic nutrition. It explores the biochemistry of the macronutrients as well as the known vitamins and minerals in detail. Toxicities, deficiencies, therapeutic uses and appropriate doses are examined. Dietary requirements for micro and macro nutrients are covered. Prerequisites: BS525, BS514, CS611.

*2 lecture hours; 2 semester credits*

NUTRITION 621

## Nutrition II

This course is a continuation of Nutrition I. Prerequisite: NNT611.

*2 lecture hours; 2 semester credits*

NUTRITION 711

## Nutrition III

This course explores the use food as medicine. Therapeutic diets, dietary manipulation and supplementation are discussed in detail. Emphasis is on restoring normal physiological function and structural integrity by providing the normal components of living systems. Nutritional evaluation, specialized diets, and nutritional counseling are covered. Prerequisite: NNT621.

*2 lecture hours; 2 semester credits*

NUTRITION 721

## Nutrition IV

This course builds on the information taught in Nutrition III. Students will be expected

to synthesize knowledge from biochemistry and basic nutrition for application to clinical conditions and lifespan issues. An explorative approach will be utilized in classroom with an emphasis on clinical application. Prerequisite: NNT711.

*2 lecture hours; 2 semester credits*

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## Clinical Sciences

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CLINICAL SCIENCES 611

## Pathology I

The pathology I lecture/lab series introduces the student to the fundamental basis of disease by studying pathophysiology on both cellular and genetic scales. Such studies include cell death and adaptation, inflammation, tissue regeneration and fibrosis, hemodynamic disorders, neoplasia, genetic diseases, and infectious disease. Each pathophysiologic process studied is placed in a clinical context by reviewing associated physical, radiographic, gross, and microscopic findings. Laboratory exercises require the student to apply information acquired in lecture to various clinical scenarios that are more frequently encountered in practice. The course concludes with the beginning of the study of diseases by organ system. Prerequisites: BS511, BS512, BS513, BS515.

*3 lecture hours, 2 laboratory hours; 4 semester credits*

CLINICAL SCIENCES 621

## Pathology II

The pathology II lecture/lab series is a continuation from Pathology I of the study of diseases in each organ system and considering effects on multiple organs systems. Each pathophysiologic process studied is placed in a clinical context by reviewing associated physical, radiographic, gross, and microscopic findings. Pathology laboratory exercises require the student to apply information acquired in lecture to various clinical scenarios which are more frequently encountered in practice. Prerequisite: CS611.

*3 lecture hours, 2 laboratory hours; 4 semester credits*

CLINICAL SCIENCES 612

## Clinical Diagnosis I

This course applies the knowledge of pathology, physical exam, and laboratory testing to develop the skills necessary to determine appropriate diagnoses for patients manifest-

ing the signs and symptoms of disease. The material is covered for each organ system with an emphasis on the integration of information from multiple systems. Prerequisites: BS521, BS523, BS525.

*5 lecture hours, 5 semester credits*

CLINICAL SCIENCES 622

## Clinical Diagnosis II

This course is a continuation of Clinical Diagnosis I. Prerequisite: CS612.

*5 lecture hours, 5 semester credits*

CLINICAL SCIENCES 613

## Public Health/Epidemiology

This course covers the current environmental and public health concerns and issues. The course integrates health with diet, air and water pollutants, noise, and substance abuse, compares community hygiene and industrial hygiene, defines epidemiology, and recognition of major communicable and non-communicable diseases. Prerequisite: BS522.

*2 lecture hours, 2 semester credits*

CLINICAL SCIENCES 614

## Immunology

This course covers specific and non-specific components of the human immune system and the role played by each in protection from microbes and non-living agents. Hypersensitivity reactions, immunodeficiency, autoimmune diseases, immune responses to cancer and psychoneuro-immunology are also discussed. Prerequisites: BS525, BS522

*2 lecture hours, 2 semester credits*

CLINICAL SCIENCES 612L

## Physical Examination Lab I

This laboratory course begins the development of the skills required to conduct specialized and complete physical examinations. The course begins with learning to take a complete patient medical history. The student will learn the selection of appropriate examination and diagnostic procedures that correspond to the patient's history and complaints. This course is offered in conjunction with the courses in Laboratory and Clinical Diagnosis. The integration of the skills gained in these courses begins the process of developing the clinical decision-making ability required of a naturopathic physician.

*2 laboratory hours, 1 semester credit*

CLINICAL SCIENCES 622L

## Physical Examination Lab II

This course is a continuation of Physical Ex-

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amination I. Students will complete the process of learning physical examination skills for all systems of the human body.

*2 laboratory hours, 1 semester credit*

CLINICAL SCIENCES 613

## Laboratory Diagnosis I

This course covers the principle laboratory tests used to evaluate and diagnose disease states. The student will learn the selection of appropriate laboratory and diagnostic procedures that correspond to the patient's history and complaint. The student will also expand upon their knowledge base from previous courses in physiology and biochemistry in learning about and understanding the rationale behind common laboratory procedures, including serum chemistries, CBC, and urine studies.

*2 lecture hours; 2 semester credits*

CLINICAL SCIENCES 623

## Laboratory Diagnosis II

This course is a continuation of Laboratory Diagnosis I.

*2 lecture hours; 2 semester credits*

CLINICAL SCIENCES 613L

## Laboratory Diagnosis Lab I

In this course students will learn to do in-office laboratory procedures including venipuncture. Co-requisite: NCS 613.

*1.5 laboratory hours, 0.75 semester credit*

CLINICAL SCIENCES 623L

## Laboratory Diagnosis Lab II

This course is a continuation of Laboratory Diagnosis Lab II. Co-requisite: NCS 623.

*1.5 laboratory hours, 0.75 semester credit*

CLINICAL SCIENCES 617

## Medical Genetics

This course covers the basis, the diagnosis, and the transmission of chromosomal and genetic disorders. The role of genetics and disease and the prenatal diagnosis of genetic and chromosomal abnormalities will be discussed. Special emphasis will be placed on preparing the students to recognize potential genetic abnormalities in a clinical setting, on methodologies to educate and inform patients on the genetic basis of their particular disease and on the resources available for additional testing, treatment or counseling. Prerequisites: BS515

*1 lecture hour, 1 semester credit*

CLINICAL SCIENCES 711

## Diagnostic Imaging I

This course covers radiographic anatomy,

and imaging techniques. A basic introduction to imaging, including radiography, computer tomography (CT), magnetic resonance imaging (MRI), ultrasound, and bone scan (scintigraphy) is discussed. The basic concepts of these techniques and their use in diagnosis are discussed. This course will also cover basic radiographic anatomy of the skeletal system and viscera. Prerequisites: NCS 611, 612, 621, 622

*2 lecture hours, 2 semester credits*

CLINICAL SCIENCES 722

## Diagnostic Imaging II

This course is a continuation of Diagnostic Imaging I with progressive emphasis on the use of imaging techniques to diagnose disease. Prerequisite: NCS 711

*2 lecture hours, 2 semester credits*

CLINICAL SCIENCES 714 AND 723

## Clinical Forum I and II

These courses explore the clinical applications of the basic sciences and the clinical courses taught concurrently in this semester. Case presentations and clinical skills are emphasized through a problem based learning format using naturopathic principles as the foundation.

*2 laboratory hours; 1 semester credit each*

CLINICAL SCIENCES 715

## Emergency Procedures

This course will familiarize the students with emergency situations and procedures that may be seen in the Emergency Department or private practice. The student will learn to discern emergent presentations by review of clinical scenarios and be able to elicit a proper history and physical exam to properly refer or treat the patient in the confines of their scope of practice.

*2 lecture hours, 2 semester credits*

CLINICAL SCIENCES 721

## Pharmacology I

Dose response relationships, pharmacokinetics, pharmacodynamics, pharmacogenetics, drug toxicity, signal transduction and second messengers are covered. Drug interactions, indications/contraindications, food/herb interactions are discussed. The pharmacology and toxicology of the drugs of the nervous, respiratory and cardiovascular systems will be examined.

*Prerequisites: BS515, 525, 514, 524*

*2 lecture hours; 2 semester credits*

CLINICAL SCIENCES 811

## Pharmacology II

This course, a continuation from Pharmacology I, examines the most common pharmaceutical agents in clinical practice and the ones most likely to be encountered in a clinical setting in general practice. It reviews antibiotics, antimicrobials, both steroidal and non-steroidal, anti-inflammatory agents, chemotherapeutic agents, hormones, and commonly prescribed medications. Prerequisite: CS721.

*2 lecture hour; 2 semester credits*

CLINICAL SCIENCES 812

## Environmental Medicine

This course focuses on the health effects of pollutants in the home, workplace as well as in the air, water, earth, and food supply. Diagnosis and treatment of health conditions caused by these pollutants is covered with special emphasis on treating the chemically sensitive patient or those with environmental illness. Prerequisites: CS 621, 622

*1.5 lecture hours; 1.5 semester credits*

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## Homeopathic Medicine

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HOMEOPATHIC MEDICINE 621

## Homeopathy I

This course lays the foundation of the basic laws and principles of Homeopathy upon which future courses will build. The principles as set forth by Hahnemann in his Organon are the bases of the course. The student will also become thoroughly acquainted with the use of repertory.

*2 lecture hours, 2 semester credits*

HOMEOPATHIC MEDICINE 711

## Homeopathy II

This course will continue the examination of Homeopathy, with emphasis on the concept of acute prescribing, case taking, and analysis. Students will continue their discussion and understanding of basic remedies, especially the drug pictures of the major polycrest remedies. Prerequisite HM621

*3 lecture hours, 3 semester credits*

HOMEOPATHIC MEDICINE 721

## Homeopathy III

Students will continue their study of the hierarchy of symptoms as they are expressed in the repertory and will begin to recognize the keynote symptoms of various remedies and be able to distinguish among them. The

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differences between constitutional and acute prescribing will be discussed.

Prerequisite: HM711.

*3 lecture hours, 3 semester credits*

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## Naturopathic Obstetrics

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NATUROPATHIC OBSTETRICS 811

### Obstetrics

This course addresses itself to health care appropriate to the special circumstances of pregnancy. Topics covered include diagnosis of pregnancy, pre-natal care, therapeutics for early pregnancy, management of minor complaints of pregnancy, infertility, an overview of normal fetal development, labor and birth, and the post-partum care of mothers and infants. Prerequisites: CS622, CS623.

*2 lecture hours, 2 semester credits*

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## Naturopathic Practice/Organ Systems

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NATUROPATHIC PRACTICE 714

### Gynecology

This course synthesizes concepts of female anatomy, physiology, and pathophysiology and applies them to clinical conditions. Physical exam, laboratory and diagnostic evaluation, and clinical diagnosis are presented for major clinical conditions. Naturopathic treatment of commonly encountered gynecological issues is included. Prerequisite: CS 611, 612, 621, 622.

*2 lecture hours, 2 semester credits*

NATUROPATHIC PRACTICE 721

### Pediatrics

Upon completion of this course the student will be able to recognize and diagnose the conditions of the pediatric patient encountered in a general naturopathic practice. Naturopathic therapy and management of these disorders are discussed along with the appropriate use of referral. Prerequisites: CS 611, 612, 613, 621, 622, 623.

*2 lecture hours; 2 semester credits*

NATUROPATHIC PRACTICE 722

### Cardiology

This course covers the pathophysiology, advanced diagnosis and treatment of cardiovascular diseases. Both conventional and naturopathic therapies are covered, and upon completion students will be able

to understand and apply this knowledge to the care of patients with cardiac disease and know when to refer for specialized diagnosis and treatment. Prerequisites: CS 611, 612, 613, 621, 622, 623.

*2 lecture hours; 2 semester credits*

NATUROPATHIC PRACTICE 725L

### Gynecology Lab

Physical examination practicum relevant to gynecology, including breast and pelvic exams. Prerequisite NNP714.

*1 laboratory credit; 0.5 semester credit*

NATUROPATHIC PRACTICE 713

### Gastroenterology

This course examines the digestive tract and associated organs, and disorders associated with it. Physical examination, imaging, and laboratory techniques necessary to understand and diagnose these disorders are discussed along with their naturopathic treatment. Prerequisites: CS 611, 612, 613, 621, 622, 623.

*2 lecture hours; 2 semester credits*

NATUROPATHIC PRACTICE 825

### Minor Surgery

Minor surgical procedures as defined by the scope of practice for naturopathic physicians are taught. The course covers common minor surgery office procedures such as suturing techniques, wound care, local anesthesia, and bandaging techniques. Topics also include recognizing and treating infection, burns, and conditions requiring referral for surgical intervention. Prerequisites: CS622.

*1.5 lecture hours, 1 laboratory hour; 2 semester credits*

NATUROPATHIC PRACTICE 811

### Eye, Ear, Nose and Throat

The diagnosis and naturopathic and allopathic treatment of diseases of the eyes, ears, nose, and throat are discussed. Upon completion of this course students will be able to diagnose common and important diseases, know when to refer patients for specialty diagnosis and treatment, and will be able to apply naturopathic principles and modalities in case management. Prerequisites: CS 611, 612, 613, 621, 622, 623.

*1 lecture hour; 1 laboratory hour; 1.5 semester credits*

NATUROPATHIC PRACTICE 812

### Endocrinology

This course covers the diagnosis and naturopathic and conventional management of

diseases and imbalances of the endocrine system. Upon completion, students will be able to recognize and diagnose hormonal disorders, know when to refer patients for specialty diagnosis and treatment, and be able to apply naturopathic principles and modalities in endocrine case management. Prerequisites: CS 611, 612, 613, 621, 622, 623.

*1.5 lecture hours; 1.5 semester credits*

NATUROPATHIC PRACTICE 813

### Neurology

This course constitutes a review of the neurological exam with emphasis on diagnosis of neurological conditions. It will include naturopathic treatment and management of diseases of the nervous system as they are discussed.

Prerequisites: CS 611, 612, 613, 621, 622, 623; BS 525.

*1.5 lecture hours, 1.5 semester credits*

NATUROPATHIC PRACTICE 821

### Geriatrics

This course covers the aging process and the new field of anti-Aging medicine. Conventional geriatrics topics are discussed as well as topics on geriatric illnesses and their Naturopathic interventions.

Prerequisites: CS 611, 612, 613, 621, 622, 623.

*1 lecture hour; 1 semester credit*

NATUROPATHIC PRACTICE 814

### Urology/Proctology

This course covers disorders of the urinary system, male genitalia, and the anal-rectal region. Diagnosis and conventional and naturopathic management of cases are covered.

Prerequisites: CS 611, 612, 613, 621, 622, 623.

*1.5 lecture hours, 1.5 semester credits*

NATUROPATHIC PRACTICE 823

### Oncology

This course covers the diagnostic, prognostic and preventative and epidemiological information for common cancers. Various theories of cancer are discussed as well as both conventional and non-conventional treatments. Case studies are used to help cement the concepts covered in relation to various malignancies. At the conclusion of this course students will be prepared to screen for common cancers and co-manage patients with cancer.

Prerequisites: CS 611, 612, 613, 621, 622, 623.

*1.5 lecture hours, 1.5 semester credits*

NATUROPATHIC PRACTICE 824

### Dermatology

The diagnosis and treatment of diseases,

# Naturopathic Medicine

which manifest in skin lesions are discussed. Naturopathic treatment and prevention are taught. Prerequisites: CS 611, 612, 613, 621, 622, 623.

1.5 lecture hours, 1.5 semester credits

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## Naturopathic Principles and Practice

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### PRINCIPLES AND PRACTICE 511

#### History of Naturopathic Medicine

This course will examine the historical, socioeconomic, and political foundations of Naturopathic Medicine and its eclectic blend of healing arts and fundamental roots; Botanical Medicine, Nature Cure, Physical medicine, Hydrotherapy, Homeopathy, Energy Medicine, and Ancient Healing systems from around the globe.

2 lecture hours; 2 semester credits

### PRINCIPLES AND PRACTICE 512

#### Philosophy of Naturopathic Medicine I

This course will explore the philosophical foundations of naturopathic medicine, which form the basis for therapeutic intervention. Vitalistic medicine in the United States of America as an influence on the creation of the naturopathic profession will be discussed. The overall emphasis of the course will be on the philosophical principles that define the empirical "natural laws" which describe the phenomenon of healing. The relationship of naturopathic principles to medical science is included.

1 lecture hour; 1 semester credit

### PRINCIPLES AND PRACTICE 522

#### Philosophy of Naturopathic Medicine II

Nature acts powerfully through healing mechanisms in the body and mind to maintain and restore health. Students will receive a more in-depth utilization of naturopathic methods and medicinal substances, which work in harmony with the human system, thus facilitating long-lasting health and recovery. In addition to employing various natural medicines, students will gain an important perspective of the vital force and its role in the healing process, when used in conjunction with naturopathic principles. Prerequisite: PP512.

1 lecture hour; 1 semester credit

### PRINCIPLES AND PRACTICE 811

#### Practice Management I

Students are taught the current procedural practices for the operation of a private prac-

tice. In addition, the practical aspects of operating a practice as a small business are discussed. Students are encouraged to begin thinking about their personal career path in naturopathic medicine. Prerequisites: CS 611, 612, 613, 621, 622, 623.

2 lecture hours, 2 semester credits

### PRINCIPLES AND PRACTICE 821

#### Medical Jurisprudence and Ethics

This course covers the basics of law as it applies to medical practice. Informed consent, confidentiality and professional liability are discussed. Naturopathic licensing laws in various jurisdictions are contrasted and compared along with an in depth review of the practice act in Connecticut. Prerequisite: PS712.

1.5 lecture hours, 1.5 semester credits

### PRINCIPLES AND PRACTICE 822

#### Practice Management II

This course introduces the student to the business procedures and practice used in the successful operating of a naturopathic practice. Prerequisite: PP721.

1.5 lecture hours, 1.5 semester credits

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## Oriental Medicine

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### ORIENTAL MEDICINE 611

#### Oriental Medicine I: Fundamentals

This course introduces the fundamental philosophy, diagnostic techniques and therapeutic techniques of Oriental medicine and Traditional Chinese Medicine ("TCM"). The purpose of the course is to allow the student to integrate the basic philosophical concepts of Oriental Medicine into naturopathic practice. This includes applying TCM principles and Oriental medical philosophy to the human body; having a basic appreciation for relationships between the Oriental zangfu ("organs"); and having a fundamental understanding of the Oriental modes of diagnosis, as found in the "Four Examinations" and "Eight Principles" including pulse, tongue, facial, palpation, and questioning techniques. The basic tenets of clean needle technique and safe needle insertion as they relate to acupuncture and moxibustion will also be covered. Prerequisites: BS521, BS525.

2 lecture hours; 2 semester hours

### ORIENTAL MEDICINE 621

#### Oriental Medicine II

This course is a continuation of Oriental

Medicine I. Prerequisite: OM 611  
2 lecture hours; 2 semester hours

*Further study in OM may be taken through the Acupuncture Institute. Refer to the catalog section on Acupuncture.*

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## Physical Medicine

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### PHYSICAL MEDICINE 522

#### Living Anatomy: Palpation

This laboratory course introduces how to locate and palpate the bony landmarks, attachments/origins, and the superficial musculature of the entire body. It is an adjunct to the Anatomy courses and a precursor to the courses in physical medicine.

1.5 laboratory hours; 0.75 semester credits

### PHYSICAL MEDICINE 521

#### Hydrotherapy

This course introduces students to the physiological principles the clinical application of the therapeutic use of water, heat, and cold. In the laboratory portion of this course students learn procedures by administering and receiving treatments and determining appropriate applications. Prerequisites: BS521.

0.5 lecture hour; 1.5 laboratory hours; 1.25 semester credits

### PHYSICAL MEDICINE 612

#### Physiological Therapeutics

This course covers the physics, clinical, and contraindications of the use of heat, cold, high-volt galvanism, interferential current, low-volt galvanism, ultrasound, electrical muscle stimulation, diathermy, and paraffin. Upon completion, students will be able to use these modalities both individually and in conjunction with other therapies in the treatment of musculoskeletal and other disorders. Prerequisites: BS 511, 515, 521, 525.

1 lecture hour; 2 laboratory hours; 2 semester credits

### PHYSICAL MEDICINE 621

#### Orthopedic Assessment

Students in this course will learn to diagnose orthopedic injuries and diseases. Those conditions that can be safely treated in a general practice setting are distinguished from those requiring referral to a specialist. Prerequisite: BS 511, 515, 521, 525.

1 lecture hour; 2 laboratory hours; 2 semester credits

# Naturopathic Medicine

## PHYSICAL MEDICINE 711

### **Naturopathic Manipulative Therapeutics I**

This course will be a basic presentation of the principles and practices of manipulation of the axial spine. Lecture will include discussion of the neurological rationale for manipulation, as well as, various methods of manipulation both force and non-force techniques. Soft tissues techniques such as Post-Isometric Relaxation Technique and Positional Release Technique will be discussed and taught in lab. Palpation, neurological and orthopedic evaluation will be performed prior to any manipulative procedures. Prerequisites: PM 621  
*2 lecture hours; 4 laboratory hours; 4 semester credits*

## PHYSICAL MEDICINE 721

### **Naturopathic Manipulative Therapeutics II**

This course will extend NPM711 by introducing principles and biomechanics of extremities as well as gait analysis. Non-force techniques such as Sacral-Occipital Technique (SOT) and Cranial-Sacral Techniques will be reviewed. Prerequisites: PM711  
*2 lecture hours; 4 laboratory hours; 4 semester credits*

## PHYSICAL MEDICINE 821

### **Therapeutic Exercise/Sports Medicine**

This course provides an overview of exercise as a preventative and therapeutic tool. Students will learn to perform a fitness assessment and describe and monitor exercise programs for persons with a variety of common disease conditions as well as treatments for sports injuries. Prerequisite: PM721  
*2 lecture hours; 2 semester credits*

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## Psychology

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## PSYCHOLOGY 511

### **Mind-Body Medicine I**

This course introduces the concept of the role of stress in the development of disease and explores energetic models of healing and the scientific basis of mind-body medicine. The focus is on learning, experiencing, and practicing mind-body techniques for stress reduction and self-assessment.  
*1 lecture hour; 0.5 laboratory hour; 1.25 semester credits*

## PSYCHOLOGY 521

### **Counseling Skills I**

This course provides an introduction to

developing the naturopathic practitioner/patient relationship via the development of communication skills. Professional issues such as ethics, confidentiality, trust, appropriate boundaries, and relationship building are included. Specific communication skills related to effective patient interviewing are practiced experimentally using exercises in class. Students practice the skills of attending, empathy, active listening, and focusing on important client concerns to identify and begin collaborative goal setting.

*1 lecture hour; 1 laboratory hour; 1.5 semester credits*

## PSYCHOLOGY 621

### **Psychological Assessment**

This course covers the diagnosis of psychiatric disorders according to the Diagnostic and Statistical Manual of Mental Disorders IV. Included is the development of the DSM, psychological assessment considerations, referral options, and treatment modalities including psychotherapeutic, psychotropic, and alternative interventions. Special attention is paid to addictions and eating disorders. Prerequisite: PS521.

*2 lecture hours; 2 semester credits*

## PSYCHOLOGY 711

### **Counseling Skills II**

This course introduces current holistic counseling theories and interventions through lectures, assignments, readings, and experimental exercises. Counseling skills with reference to actual cases are explored using problem-based learning methods. Students will demonstrate basic interviewing techniques and strategies for engaging and motivating the client through reciprocal dialogue during the developmental stages of a counseling relationship. This course emphasizes the basic counseling skills required of a physician in daily practice, in addition to the special circumstances of bereavement, crisis management, and chronic and terminal illness. Prerequisites: PS521, 621.  
*1 lecture hour; 1 laboratory hour; 1.5 semester credits*

## PSYCHOLOGY 712

### **Mind-Body Medicine II**

This course covers key issues in the relationship between a physician and client. It includes an examination of ethical issues, confidentiality, and development of trust, setting appropriate boundaries, and dealing with patients with life-threatening illnesses.

Prerequisites: PS521, 621.

*2 lecture hours; 2 semester credits*

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## Research

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## RESEARCH 511

### **Research Methodology/Statistics**

This course introduces students to biomedical research principles, epidemiology, biostatistics, and accessing the medical literature with an emphasis on complementary and alternative medicine research.

*1.5 lecture hours; 1.5 semester credits*

## RESEARCH 711

### **Thesis I**

In this course the student performs a literature search in a naturopathic area of interest and presents a proposal for a Senior Paper (literature survey only) or a Senior Research Paper (also includes original research) that must be approved by the Research Committee.

*1 lecture hour; 1 semester credit*

## RESEARCH 811

### **Thesis II**

With the advice and guidance of the faculty research advisor, the student completes a Senior Paper in conformity with the guidelines adopted by the Research Committee. Prerequisite: RS711.

*1 lecture hour; 1 semester credit*

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## Clinical Education

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## CLINICAL EDUCATION 621

### **Clinical Entry**

This course provides an introduction to clinic policy, procedures and requirements, including standard operation procedures, and the roles and responsibilities of the student clinician as stated in the current Clinic Student Handbook. There is an overview of case management issues, charting and lab procedures. The class prepares students for entry into the clinic. Prerequisite: Completion of all year 1 & 2-year courses concurrent with the completion of this course

*1 semester hour; 1 semester credit*

*Cardio-Pulmonary Resuscitation (CPR) - Prior to entering the clinic, it is the student's responsibility to obtain certification in CPR for the Health Care Professional. A list of training sites will be available.*

# Naturopathic Medicine • Nutrition

## CLINICAL EDUCATION 712

### Clinical Education I

Students begin to gain practical clinical skills by working under the supervision of licensed naturopathic physicians and other healthcare providers in the Clinic and in Preceptorships. Students learn primarily through observation and are given limited responsibility in the clinical setting during this semester. Performance objectives are focused on basic clinical procedures. Prerequisite: NCE 621 and Clinic Entrance Exam. Course runs May – Dec.

16 laboratory hours; 8 semester credits

## CLINICAL EDUCATION 722

### Clinical Education II

This is a continuation of the clinical training begun in Clinical Education I and includes the ongoing development of clinical skills and case management under supervision of licensed physicians. Students gradually assume increased responsibility as secondary caregivers under the supervision of licensed physicians. Prerequisite: NCE 712 Course runs Jan – May.

16 laboratory hours; 8 semester credits

## CLINICAL EDUCATION 812

### Clinical Education III

Interns assume the role of primary care giver under the direct supervision of a licensed physician. Physical examination, diagnostic assessment and treatment skills are honed while specific performance objectives of clinical training are met. Minimum summer hours requirements must be met. Prerequisite: NCE 722 Course runs May –Dec.

20 laboratory hours; 10 semester credits

## CLINICAL EDUCATION 822

### Clinical Education IV

In this final semester of clinical training students examine, diagnose and treat patients in preparation for providing primary care as a naturopathic physician. 144 Preceptor hours must be completed. Prerequisite: NCE 812. Course runs Jan – May.

20 laboratory hours; 10 semester credits

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## Elective courses

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## CLINICAL SCIENCES 822E

### Practicum in IV Therapy (Elective)

The student will learn the indications and contraindications for various IV therapies in the naturopathic practice. Preparation and

administration (including osmolality) of various IV solutions using proper aseptic techniques will be emphasized. Lectures will be followed by hands-on in-class experience.

1 lecture hour; 1 laboratory hour; 1.5 semester credits

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## Nutrition

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## NUTRITION 481

### Nutritional Science

The following nutritional science courses are offered only in the master's program in Nutrition. This program is available on the main campus and online.

- 560 A Path physiologic Basis of Metabolic Disease
- 560 B Biochemistry of Nutrition
- 560 C Vitamins and Minerals
- 560 D Clinical Biochemistry
- 560 E Assessment of Nutritional Status
- 560 F Nutritional Therapeutics
- 560 H Developmental Nutrition
- 560 J Research in Nutrition
- 560 L Nutrition and Exercise
- 560 M Biostatistics
- 560 P Botanical Medicine
- 560 R Nutrition and Culture

## NUTRITION 560A

### Path physiologic Basis of Metabolic Disease

A study of the underlying mechanisms of disease and the complex interrelationships between critical systems including respiratory, urinary, cardiovascular, digestive, nervous and endocrine. Lectures will include fluid and electrolyte imbalances, acid and base imbalances, inflammation, hypersensitivity, infection, necrosis, and neoplasm's. The influence of various nutrients on systemic function will be stressed. Prerequisite: Anatomy & Physiology I, II.

4 semester hours

## NUTRITION 560B

### Biochemistry of Nutrition

A lecture course covering the static and dynamic aspects of the biochemistry of carbohydrates, lipids, amino acids, proteins, nucleic acids, cations, anions, enzyme kinetics, hormones and vitamins in the healthy individual. Integration and control mechanisms of the various metabolic pathways are particularly emphasized. Prerequisite: Introduction to Biochemistry.

4 semester hours

## NUTRITION 560C

### Vitamins and Minerals

Basic and clinical aspects of nutrient homeostasis concentrating on vitamin and mineral metabolism at the cellular and tissue level. Lectures will include specific functions, requirements, sources, assay methods, effects of deficiencies and excesses of each vitamin and mineral. Prerequisite: Nutrition 560B.

4 semester hours

## NUTRITION 560D

### Clinical Biochemistry

A lecture course dealing with the biochemistry of disorders arising from acid/base imbalance and the abnormal metabolism of the carbohydrates, lipids, proteins, nucleic acids, bile pigments, vitamins, and hormones. Prerequisite: Nutrition 560B.

3 semester hours

## NUTRITION 560E

### Assessment of Nutritional Status

Clinical and laboratory analytical procedures for evaluation of nutrient status, including blood and other tissue analysis, dietary records and questionnaires, case history, physical examination, anthropometrical methods, etc.

3 semester hours

## NUTRITION 560F

### Nutritional Therapeutics

A survey of diseases with primary or secondary nutritional implications and related nutritional strategies. For each disease covered, the etiology, pathology, epidemiological, and prevailing methods of treatment will be presented. The mechanism of action of various nutritional therapies and the role of nutrition in support of other treatments and modalities will be explored.

4 semester hours

## NUTRITION 560H

### Developmental Nutrition

Nutritional considerations and health related concerns of growth and development. Special attention will be given to pregnancy/lactation, fetal/neonatal, and infant/pediatric stages of development. Nutritional needs of the adolescent and elderly will be discussed.

3 semester hours

## NUTRITION 560J

### Research in Nutrition

Independent research project with faculty guidance, based on literature survey or original research. Project approval is required.

## Nutrition • Physician Assistant

Prerequisite: Advanced standing, permission of advisor.

*3 semester hours*

NUTRITION 560L

### **Nutrition and Exercise**

An instructional class for nutritionists detailing proper dietary protocols for enhancing endurance and performance during exercise and sports. Elective.

*3 semester hours*

NUTRITION 560M

### **Evidence Based Nutrition.**

The course describes the analytical approaches for searching and interpreting clinical research data reported in the literature using evidence based practice with emphasis on the application of those data in clinical practice. Biological variation, experimental design, data and fact differences, matching analysis to design, integrity in analysis, and bias in design and analysis, are considered in detail.

*3 semester hours*

NUTRITION 560P

### **Botanical Medicine**

A study of the use of herbs in nutritional practice. Discussions on individual herbs will include botany, mechanism of action, pharmacological/toxicological properties, clinical application, product standardization, and recommended dosages.

*3 semester hours*

NUTRITION 560R

### **Nutrition and Culture**

This course reviews nutrition principles, examines dietary patterns, and outlines the cultural importance of food in various ethnic and American societies. This course is designed to provide an overview of the cultural aspects of food, the societal influences and origins of food traditions. It will cover aspects of American (including Native American) and selected ethnic cuisines. Material will cover a brief overview of culinary history and future trends.

*3 semester hours*

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## **Physician Assistant (MSPA)**

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PHYSICIAN ASSISTANT 505

### **Information Literacy**

This course provides students with the basic terminology, concepts and methods of research

in order to be able to locate, evaluate and apply current evidence to clinical practice.

*3 credits*

PHYSICIAN ASSISTANT 511

### **Anatomy I with Lab**

This course is designed to provide an introduction to the functional anatomy of the human body. Students will have the opportunity to locate, identify, and dissect all major muscular, nervous, vascular, bony, and soft tissue structures using cadaveric specimens.

*4 credits*

PHYSICIAN ASSISTANT 512

### **Anatomy II with Lab**

This course builds on Anatomy I investigating the functional anatomy of the human body by offering students the opportunity to locate, identify, and dissect all major muscular, nervous, vascular, bony, and soft tissue structures using cadaveric specimens.

*4 credits*

PHYSICIAN ASSISTANT 521

### **Physiology/Biochemistry I**

This course offers a fundamental and integrated approach to human physiology with emphasis on the study of the body's functional system from a medical perspective.

*3 credits*

PHYSICIAN ASSISTANT 522

### **Physiology/Biochemistry II**

This course builds on Physiology I to offer a fundamental and integrated approach to human physiology with emphasis on the study of the body's functional system from a medical perspective.

*3 credits*

PHYSICIAN ASSISTANT 526

### **Pathophysiology**

This course is designed to provide the basic pathophysiologic understanding of diseases and the resulting clinical presentation.

*3 credits*

PHYSICIAN ASSISTANT 531

### **Introduction to Clinical Lab and Microbiology**

This course will provide the student with advanced microbiology, virology and immunology to understand the complexities of infectious disease. Emphasis will be placed on clinically relevant pathogens, isolation and aseptic techniques, identification and treatment.

*3 credits*

PHYSICIAN ASSISTANT 541

### **Clinical Genetics**

This course familiarizes students with concepts of cellular and molecular biology; different types of mutations and their effects; inheritance patterns; genetic testing techniques; counseling referrals and key resources with an emphasis on accurately creating and interpreting the pedigree in regards to disease identification and/or susceptibility, therapeutic options and future clinical applications of genetics in primary care.

*2 credits*

PHYSICIAN ASSISTANT 551

### **History and Physical Exam I with Lab**

This on-going course focuses on developing the skills of obtaining a comprehensive history and a problem focused history; performing a comprehensive screening exam and an appropriate problem focused exam; the ability to integrate and interpret the findings from these to create a foundation for further clinical evaluation. Emphasis is placed on identifying normal versus abnormal findings and on accurate and appropriate documentation.

*3 credits*

PHYSICIAN ASSISTANT 552

### **History and Physical Exam II with Lab**

This on-going course builds on H&P I in developing skills of obtaining a comprehensive history and a problem focused history; performing a comprehensive screening exam and an appropriate problem focused exam; the ability to integrate and interpret the findings from any of these to create a foundation for further clinical evaluation. Emphasis is placed on identifying normal versus abnormal findings and on accurate and appropriate documentation.

*3 credits*

PHYSICIAN ASSISTANT 553

### **History and Physical Exam III with Lab**

This on-going course builds on H&P I and II in developing skills of obtaining a comprehensive history and a problem focused history; performing a comprehensive screening exam and an appropriate problem focused exam; the ability to integrate and interpret the findings from any of these to create a foundation for further clinical evaluation. Emphasis is placed on identifying normal versus abnormal findings and on accurate and appropriate documentation.

*4 credits*

# Physician Assistant

PHYSICIAN ASSISTANT 556

## **Patient Education and Counseling**

This course is a practical, evidence based approach to educate and counsel patients in order to improve lifestyle, increase adherence and reduce medical errors.

*2 credits*

PHYSICIAN ASSISTANT 561

## **Health, Wellness and Nutrition Throughout the Lifespan**

This course will emphasize disease prevention, health promotion during various stages of life with emphasis on the pediatric and geriatric population.

*2 credits*

PHYSICIAN ASSISTANT 571

## **Clinical Pharmacology I**

This course introduces the student to the basic principles of pharmacology, including mechanisms of action; absorption, distribution, metabolism, and excretion; pharmacokinetics; interactions with other drugs and with food; problems with special populations (prenatal, neonatal, elderly); rational drug usage for clinical disorders (therapeutics); clinical measures; and toxicology.

*3 credits*

PHYSICIAN ASSISTANT 572

## **Clinical Pharmacology II**

This course builds on Clinical Pharmacology I with more advanced principles of pharmacology, including mechanisms of action; absorption, distribution, metabolism, and excretion; pharmacokinetics; interactions with other drugs and with food; problems with special populations (prenatal, neonatal, elderly); rational drug usage for clinical disorders (therapeutics); clinical measures; and toxicology.

*3 credits*

PHYSICIAN ASSISTANT 602

## **Information Literacy and Medical Writing**

This course builds on Information Literacy I by integrating and applying those skills by requiring students to write in various scientific and medical formats.

*2 credits*

PHYSICIAN ASSISTANT 603

## **Medical Ethics**

This course presents the student with the four topic method of evaluation of Ethical issues. Each student will look at the ethical issue presented looking at Medical indications, patient preferences, quality of life and contextual

features to provide a response to the ethical dilemma. The course will provide a foundation for the student to work through ethical dilemmas provided by the professor. During this course the student will identify and evaluate ethical issues of their own and touch upon options and solutions and provide the student with the ability to employ those methods throughout their career.

*2 credits*

PHYSICIAN ASSISTANT 604

## **Professional Practice and Policy**

This course incorporates the history, development, certification, licensure, reimbursement and key organizations of the PA profession as well as the role of the PA in public health and state and federal policy making.

*2 credits*

PHYSICIAN ASSISTANT 608

## **Global Health**

This course offers the student the opportunity to investigate the impact of health issues in other countries and the interactive affect on all populations in terms of epidemiology, disease, disasters, economics, health initiatives, ethics and policy.

*2 credits*

PHYSICIAN ASSISTANT 611

## **Clinical Medicine I with Lab**

This ongoing body systems based course integrates all the skills and learning from the curriculum as related to medical problems encountered in the primary care setting. Emphasis is on the integration of anatomy, physiology, pathophysiology, microbiology, history and exam findings and diagnostic procedures in order to formulate a differential diagnosis; on ordering and interpreting diagnostic tests in order to develop a working diagnosis; and on developing and implementing treatment plans including as needed therapeutic procedures, pharmacology, referral and patient education and counseling.

*4 credits*

PHYSICIAN ASSISTANT 612

## **Clinical Medicine II with Lab**

This ongoing body systems based course integrates all the skills and learning from the curriculum as related to medical problems encountered in the primary care setting. Emphasis is on the integration of anatomy, physiology, pathophysiology, microbiology, history and exam findings and diagnostic procedures

in order to formulate a differential diagnosis; on ordering and interpreting diagnostic tests in order to develop a working diagnosis; and on developing and implementing treatment plans including as needed therapeutic procedures, pharmacology, referral and patient education and counseling.

*8 credits*

PHYSICIAN ASSISTANT 613

## **Clinical Medicine III with Lab**

This ongoing body systems based course integrates all the skills and learning from the curriculum as related to medical problems encountered in the primary care setting. Emphasis is on the integration of anatomy, physiology, pathophysiology, microbiology, history and exam findings and diagnostic procedures in order to formulate a differential diagnosis; on ordering and interpreting diagnostic tests in order to develop a working diagnosis; and on developing and implementing treatment plans including as needed therapeutic procedures, pharmacology, referral and patient education and counseling.

*8 credits*

PHYSICIAN ASSISTANT 620

## **Fundamentals of Surgery**

This course presents the fundamentals of the approach to surgery and the surgical patient. Emphasis is on pre, intra and post operative care; surgical skills and techniques; management of complications, and patient education and counseling.

*4 credits*

PHYSICIAN ASSISTANT 632

## **Integrative Medicine and Practice I**

This ongoing course exposes students to the philosophies, concepts, techniques and practice of a variety of alternative and complementary medicine.

*1 credit*

PHYSICIAN ASSISTANT 633

## **Integrative Medicine and Practice II**

This ongoing course exposes students to the philosophies, concepts, techniques and practice of a variety of alternative and complementary medicine.

*2 credits*

PHYSICIAN ASSISTANT 634

## **Integrative Medicine and Practice III**

This ongoing course exposes students to the philosophies, concepts, techniques and practice of a variety of alternative and complemen-

## Physician Assistant • Statistics • Technology Management

tary medicine.  
2 credits

PHYSICIAN ASSISTANT 642

### Medical Seminar

This ongoing course utilizes a variety of techniques designed to supplement and integrate content from all didactic courses, including but not limited to: small group interaction; problem based learning; case based learning; simulation lab; reflective discussion and literature critique.  
2 credits

PHYSICIAN ASSISTANT 643

### Medical Seminar II

This ongoing course utilizes a variety of techniques designed to supplement and integrate content from all didactic courses, including but not limited to: small group interaction; problem based learning; case based learning; simulation lab; reflective discussion and literature critique.  
2 credits

PHYSICIAN ASSISTANT 644

### Medical Seminar III

This ongoing course utilizes a variety of techniques designed to supplement and integrate content from all didactic courses, including but not limited to: small group interaction; problem based learning; case based learning; simulation lab; reflective discussion and literature critique.  
2 credits

PHYSICIAN ASSISTANT 645

### Medical Seminar

This is a continuation of the didactic course. During this course, presented in the supervised clinical experience period, topics in Clinical Medicine, Integrative Medicine, Global Health and Medical Ethics are presented.  
2 credits

PHYSICIAN ASSISTANT 646

### Medical Seminar

This is a continuation of the didactic course. During this course, presented in the supervised clinical experience period, topics in Clinical Medicine, Integrative Medicine, Global Health and Medical Ethics are presented.  
2 credits

*Clinical Clerkships: Core Clinical Clerkships are Internal Medicine, Family Practice, Pediatrics, Obstetrics and Gynecology, Emergency Medicine, Psychiatry and Surgery*

\*PHYSICIAN ASSISTANT 651

### Clinical Clerkship I

One of the core supervised clinical clerkships for the Physician Assistant student.  
4 credits

\*PHYSICIAN ASSISTANT 652

### Clinical Clerkship II

One of the core supervised clinical clerkships for the Physician Assistant student.  
4 credits

\*PHYSICIAN ASSISTANT 653

### Clinical Clerkship III

One of the core supervised clinical clerkships for the Physician Assistant student.  
4 credits

\*PHYSICIAN ASSISTANT 654

### Clinical Clerkship IV

One of the core supervised clinical clerkships for the Physician Assistant student.  
4 credits

\*PHYSICIAN ASSISTANT 655

### Clinical Clerkship V

One of the core supervised clinical clerkships for the Physician Assistant student.  
4 credits

\*PHYSICIAN ASSISTANT 656

### Clinical Clerkship VI

One of the core supervised clinical clerkships for the Physician Assistant student.  
4 credits

\*PHYSICIAN ASSISTANT 657

### Clinical Clerkship VII

One of the core supervised clinical clerkships for the Physician Assistant student.  
4 credits

PHYSICIAN ASSISTANT 698

### Capstone Project

This is the capstone research project where the student is required to complete and submit their research paper of publishable quality to the faculty.  
2 credits

\*PHYSICIAN ASSISTANT 660-680

### Clinical Clerkship VII

An elective specialty supervised clinical experiences for the Physician Assistant student.  
4 credits

\*PHYSICIAN ASSISTANT 660-680

### Clinical Clerkship IX

An elective specialty supervised clinical expe-

riences for the Physician Assistant student.  
4 credits

*\*All students are required to complete all of the seven core supervised clinical clerkships. The clinical clerkship sequence will be individually assigned to students.*

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## Statistics

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STATISTICS 600

### Statistics and Quantitative Analysis

This course is an introduction to basic statistical methodology and its applications to business decisions. Topics include probabilities, discrete and continuous probability distributions, probability sampling techniques, sampling distributions, interval estimation and hypothesis testing. The basics of specific statistical tests will be presented including chi square, correlation, multiple regression and analysis of variance. Students will use software packages to perform statistical analysis. Prerequisite: Admission to graduate study.

3 semester hours

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## Technology Management

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TECHNOLOGY MANAGEMENT 400

### Marketing, Entrepreneurial and Innovation Issues and Practices in Management.

This course focuses on strategic marketing, entrepreneurial, intrapreneurial and innovation issues, opportunities and best practices in helping organizations grow in a complex global environment. which have emerged in the last few years such as the growing importance of strategic marketing, voice of the customer, customer service and innovation in helping companies grow as well as achieve and sustain competitive advantage. The business impact of new technologies which enable marketing and innovation are covered. The course also examines the principles of entrepreneurship and intrapreneurship in developing new products, services and processes. In addition to individual assignments, students are assigned to team projects to develop product or service market plans either for start-up businesses or within the context of a corporate venture. Prerequisite: Admissions to graduate studies.

3 lecture hours; 3 semester hours

# Technology Management

## TECHNOLOGY MANAGEMENT 424

### **Total Quality Management and Continuous Process Improvement.**

This course presents a comprehensive summary of methods for managing quality and continuous process improvements. The course objective is to develop an operational familiarity with contemporary methods found to be effective. Topics covered include statistical process control, quality function deployment, concurrent design, the house of quality, the Taguchi method, Six Sigma, lean and others. It also covers continuous process improvement methodologies and techniques. This course is intended for those students who do not plan to specialize in quality management. Prerequisite: Admissions to graduate studies.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 490 (TCMG 490/MEEG 490)

### **Intellectual Property and Technology.**

This course is designed for graduate students who have an undergraduate degree in Engineering, Computer Science, Mathematics, Physics, Biology, Industrial Design, etc. Students need not have any familiarity with United States law but they must be prepared to read extensively under the instructor's guidance, statutes and cases decided by the Federal and State courts. Pre-requisites: Admissions to graduate studies.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 495

### **Contemporary Issues in Communications and Quantitative Methods**

The course is designed to help students improve their communications (e.g. oral, written, and formal presentation) skills and quantitative methods and techniques used in business, technology and engineering disciplines.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 500

### **Graduate Co-Op/Internship in Technology Management.**

Students will work for a company in a role that is appropriate for an MS - TM graduate, or near graduation. Through this experience students will apply management principles and theory in a practical setting. The student will write a paper summarizing the tasks and accomplishments encountered within the organization, as well as make managerial recommendations for improvement of the

company, or division in which s/he was employed. Prerequisite: Final semester of study and the Director, TM Program approval.

*1-3 semester hours*

## TECHNOLOGY MANAGEMENT 505 (TCMG 505/MGMT 532)

### **Global Program and Project Management.**

This course focuses on the managerial aspects of how to more effectively manage, plan and execute programs/projects with a focus on high quality deliverables arriving on time, within budget, within scope and to the customer's satisfaction. Areas covered will include program and project management life cycle phases, executive sponsorship, portfolio investment management selection and prioritization, requirements, scope and project charters, planning, development, estimating, staffing, leadership, scheduling, risk management, change management, project metrics, vendor integration and management and other related topics. This course is based on current and emerging best practices and principles. It will also discuss PM certification requirements and provide real world case studies. Prerequisite: TCMG 484.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 508 (TCMG 508/MKTG 551)

### **Product Management, Innovation and Commercialization.**

This course covers new product development, innovation and commercialization, as well as the product management life cycle. Topics covered include the feasibility and investment prioritization of new products or product enhancements, raising capital for new product development, market and customer needs analysis, make versus buy alternatives and product launch and commercialization issues and considerations, including promotion, pricing, distribution, competition, pre and post sales support, systems and infrastructure support, customer service and related areas. Students will work on individual and team projects that will include the development of a new product market/business plan. Prerequisite: TCMG 400.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 510 (TCMG 510/MGMT 536)

### **Foundations of Corporate, Government and Information Security and Continuity Management.**

The course covers natural and terrorist hazards and incidents that could impact the continuity of business, government and information

services, their detection, evaluation and containment, prevention and recovery management principles and practices. Topics covered include assessment of threats, risk management and mitigation, incident management, business continuity/contingency planning and disaster recovery programs. Case studies of natural and made-made disasters such as 9/11, Katrina and others are analyzed in terms of lessons learned. Student will work on individual and team projects that will include the development of a business continuity plan. Prerequisite: Admission to graduate studies.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 511 (TCMG511/MGMT 511)

### **Human Resources Management.**

An in-depth survey of current theory, research and practice in the management of human resources in organizations. Job design, recruitment, selection, performance feedback, goal-setting, training, employee rights, safety, compensation and benefits issues are reviewed within the context of their application in the United States as a world standard for such practices, with comparisons to customs and practices in the international arena. Intensive research into current human resource topics are required. Prerequisite: TCMG 523.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 512 (TCMG 512/MGMT 598)

### **Advanced Intellectual Property Management.**

Protection of a business' intellectual property assets can make the difference between success and failure. This course will discuss the strategies and methods available for protection of intellectual property in the global environment. Students will work through the American patent, copyright and trademark processes, including how to prepare and file applications for each. Students completing this course should be able to pass the Patent Agent exam. Global business issues, such as protection of ideas in an off-shoring arrangement, IP co-development and other issues, will also be addressed. Prerequisite: TCMG 490 or Director, TM program approval.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 520 (TCMG 520/ITIS 520)

### **Information Systems Requirements, Analysis, Design and Deployment.**

A course in the analysis, design, and development of business systems. Students will learn a variety of development models and

# Technology Management

tools available for systems development, deployment and management. The role of all systems constituents is addressed through discussion of the specification, decision-making, and review of designs, documentation, program specifications, and system improvement. Course level and content is suitable for managerial as well as the more technically oriented. Prerequisites: ITIS 400 or Director, TM program approval.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 522 (TCMG 522/ITIS 521) **Healthcare Management and Administrative Technologies and Systems.**

This course covers the health care systems, processes and technologies as they relate to the constituents in the health care industry – patients, providers, regulators, insurance companies and their interactions. Also covered are electronic records, privacy and the applicable regulations. Prerequisite: ITIS 400.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 523 (TCMG 523/MGMT 523) **Leadership, Teams & Managing Change.**

This course focuses on the development of leadership skills important in the effective management of change. Through role-playing exercises, videotapes, diagnostic tools, seminar discussion, selected readings, and a group project, students will learn theory and build interpersonal skills necessary for providing leadership in diverse multicultural groups and organizations. The course will address the managerial issues present in organizations undergoing accelerating change and adopting a culture of creativity. Creating and sustaining high performance multicultural and interdisciplinary traditional and virtual teams is covered. Prerequisite: Admissions to graduate studies.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 525 (TCMG525/MGMT 535) **Finance and Accounting for Managers.**

This course provides managers with the skills required to read, interpret and apply information about an organization's financial position. Managerial accounting and finance concepts will be presented, followed by financial statement analysis. Topics presented from a managerial perspective will include how accounting data is generated during business operations, how financial statements are created and analyzed, management of finance to maximize return on

investment and stakeholder equity and other related topics. Students will be required to participate in case work applying the principles presented in the class. Prerequisite: Admissions to graduate studies.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 530 (TCMG 530/MEEG 530) **Foundations of Manufacturing Management.**

The objectives of the course are to understand and apply concepts and techniques in manufacturing management. The course includes the management of people (both traditional and high performance systems and teams), lean manufacturing techniques as used on the factory floor, and recent concepts such as Factory Physics. The course focuses on those issues that are important in supervising and managing a modern manufacturing operation. Prerequisites: graduate standing.

*3 semester hours*

## TECHNOLOGY MANAGEMENT 531 (TCMG 531/ITIS 530) **Internet Applications and Opportunities.**

The focus of this course is to acquaint the student with the structure of electronic and mobile commerce through incorporating technologies. Subjects include e-commerce vs. e-business, design vs. technology, e-business architecture, effective web-site design and maintenance, HTML, XML, CRM ERP, standards, security, information search and retrieval, and data warehousing. Course format includes discussion and case analysis, and both individual and small group projects. Prerequisites: ITIS 400 or Director, TM Program approval.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 532 (TCMG 532/MKTG 550) **Global Market Management.**

Strategy planning, implementation and control for market entry and development. Topics include social, political and economic changes affecting marketing opportunity; focused versus dispersed marketing efforts; marketing in developed and undeveloped countries; and marketing systems required for the various strategic alternatives. Prerequisite: TCMG 400.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 533 (TCMG 533/MGMT 533) **Information Technology Strategy and Governance.**

This course covers information technology plans, strategy, business/IT alignment, governance, environmental, ethical, economic,

regulatory, compliance and technical issues and trends with a focus on planning, organizing, justifying, controlling, implementing and integrating concepts and real world experiences. It discusses business and IT balanced scorecards, metrics and key performance indicators. Current and emerging best business and technology strategy and governance best practice frameworks such as COBIT, CMMI, PMBOK, Kano, VOC, QDF, ITIM, Prince2, ITIL, select ISO standards and others will be covered with emphasis on lessons learned, critical success factors and pragmatic solutions. Individual and team projects and case studies are integrated into the course. Prerequisite: ITIS 400 or Director, TM program approval.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 534 (TCMG 534/MGMT 534) **Strategic Sourcing and Vendor Management.**

This course covers the rewards and risks of outsourcing and vendor management and identifies where outsourcing should be used and not used. The objectives of the course are to help students understand how to plan, direct, manage and more effectively participate in outsourcing initiatives in terms of the feasibility of outsourcing (off-shore, near-shore, rural-shore, best shore), vendor selection, contract negotiation, vendor management and evaluation, risk assessment and terminating outsourcing deals. Prerequisite: TCMG 523 and TCMG 505 or Director, TM program approval.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 535 (TCMG 535/MGMT 535) **Foundations of Bio Tech Sciences and Management.**

This course covers the comprehensive scope of knowledge of major issues and technologies in the bio technology field. This includes regulatory, robotic, imaging, cybernetics, bio-informatics, genetics, ethics and related areas. Individual and team projects will be assigned. Prerequisite: Admissions to graduate studies.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 536 (TCMG 536/MGMT 530) **Foundations of Management and Organization.**

Concepts, methods and research, which are applicable and useful in the management of organizations, are broadly surveyed to increase student's awareness of the breadth and complexity of management processes. Fundamentals of business strategy, organizational structuring, leading, communicating and con-

# Technology Management

trolling are examined within contexts of the historical evolution of management thought, concern for high business ethics, and meeting global competition. Prerequisite: TCMG 523.  
*3 semester hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 539 (TCMG 539/MGMT 539) **International Issues.**

This course focuses on current international issues that affect business operations at home and abroad. Changing business environments are discussed and analyzed. Students are required to formulate new global business strategies in light of emerging international trends and events. In some cases, students may supplement their study by field trips and on-site analysis. Prerequisite: TCMG 400 and TCMG 484.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 540

### **Advanced Simulation and Modeling Techniques**

The purpose of this course is to provide an in-depth coverage of the use of simulation and modeling as an analysis tool for the study of production and distribution processes. The course aims to develop a sense of critical thinking, learning and problem solving. Topics include: problem formulation, data collection and analysis, random variable generation, and statistical analysis of output. Utilizes a major simulation language, SIMAN.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 545

### **Technology New Venture Creation.**

This course is for graduate students interested in starting a technology venture, joining a small firm intent upon rapid growth, or pursuing a career in consulting, venture capital, or the management of a technology business or venture for larger companies. The course will provide an opportunity to identify and analyze new business and technology venture issues and opportunities. Select topics covered include: evaluating market opportunities, designing profitable business models, producing a solid business plan, raising capital (multiple rounds), protecting intellectual property and exit strategies such as a merger, the sale of the company or an initial public offering (IPO). Prerequisites: TCMG 400.

*3 semester hours*

## TECHNOLOGY MANAGEMENT 546 (TCMG 546/MEEG 546)

### **Engineering Economics and Management.**

The course covers the concepts and methods

that will assist engineering and technology managers and professionals to make alternative investment and funding decisions regarding projects, programs, products, business expansion and other alternatives using the financial calculations involving time value of money (IRR, ROI, NPV), uncertainty and risk. Topics include engineering and related financial evaluation techniques and formulas, choosing among alternatives, sensitivity analysis, economic analysis, opportunity costs, depreciation, amortization, probability, cost estimating and systems and others. Prerequisites: TCMG 484.

*3 semester hours*

## TECHNOLOGY MANAGEMENT 550 (TCMG 550/MGMT 552)

### **Foundations of Doing Business in China.**

The course provides the fundamental knowledge of how to do business in China. It covers the economic, financial (tax), political, cultural, regulatory, infrastructure, environmental, marketing, trade, labor force and education system, demographic and technology issues, trends and practices. It identifies the various trade agreements and their implications in doing business in or with Chinese organizations. It also exposes students to U.S. federal, state and local government resources available to help establish business and trade relationships in China. Prerequisite: TCMG 400.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 551 (TCMG 551/ITIS 551)

### **Enterprise Architecture and Knowledge Management.**

This course covers enterprise data issues and opportunities from a knowledge management and business intelligence perspective. It focuses on the enterprise data architecture, data policy, data distribution, database management systems, data warehouse, mining and mart, business intelligence, knowledge management, chief architect and capturing lessons learned. Prerequisite: ITIS 400.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 552 (TCMG 522/MGMT 551)

### **Foundations of Doing Business in India**

The course provides the fundamental knowledge of how to do business in India. It covers the economic, financial (tax), political, cultural, regulatory, infrastructure, environmental, marketing, trade, labor force and education system, demographic and technology issues, trends and practices. It identifies the various trade agreements and their

implications in doing business in or with Indian organizations. It also exposes students to U.S. federal, state and local government resources available to help establish business and trade relationships in India. Prerequisite: TCMG 400.

*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 553 (TCMG 553/ITIS 553)

### **Enterprise Information Systems.**

This course will examine the role of information systems in business and how they provide the information required by management. Modular, best of breed, and other systems strategies and configurations, as well their managerial implications will be examined. The course is case-based and provides the student hands-on experience learning and utilizing Sage Software's MAS200 ERP system to complete case problems. Other enterprise systems will be discussed as well, including SAP and Oracle. Prerequisite: TCMG 484.

*3 semester hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 554 (TCMG 554/MGMT 554)

### **Foundations of Doing Business in U.S.A.**

The course provides the fundamental knowledge of how to do business in U.S.A. It examines the business environment in the U.S. and assesses the challenges and opportunities for doing business in a highly dynamic marketplace. The course will examine the commercial, political, economic, legal, organization, and cultural dimensions in entering this market. Through case studies, readings and discussions, the student will acquire the analytical tools and skills required to better understand and implement business strategies to maximize these opportunities.

*3 semester hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 556 (TCMG 556/MKTG 552)

### **Services Marketing.**

The course addresses the unique problems of marketing intangibles in the broad spectrum of service industries. The course focuses on the development, implementation and control of strategy, systems and people for effective service operations. This is a case study course. Prerequisite: TCMG 400.

*3 semester hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 557 (TCMG 557/ITIS 557)

### **Infrastructure Systems.**

This course covers the fundamentals of data networking, including signaling, routing and technologies underlying the explosive

# Technology Management

growth of e- and m-commerce. The managerial issues relevant to network utilization, security and service delivery will be addressed as the underlying communications technologies are discussed. Prerequisite: ITIS 400.  
*3 semester hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 558 (TCMG 558/MKTG 530) **E-Marketing.**

This course examines the nature of marketing in the evolving virtual worlds of Internet and mobile commerce and the impact of emerging technologies on the strategy of traditional “brick-and-mortar” companies. Various business and marketing models will be analyzed and evaluated. This course requires extensive Internet research for student projects. Prerequisite: TCMG 400.  
*3 semester hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 560 (TCMG 560/MGMT 560) **Foundations of Environmental and Energy Management.**

This course covers the assessment of current and potential environmental and energy management issues, opportunities and threats. Key issues such as global warming, pollution, global energy supply and demand needs will be discussed. Alternative energy sources are reviewed, including examination of energy technologies in each fuel cycle stage for fossil (oil, gas, synthetic), solar, biomass, wind, hydro, nuclear, and geothermal energy types, along with storage, transmission, and conservation issues. Prerequisite: Admission to graduate studies.  
*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 561 (TCMG 561/MGMT 561) **Economic, Regulatory, Cultural, and Societal Issues in Environment and Energy Management.**

The course will focus on a review of the environmental and energy management safety, hazard identification and disaster prevention policies, laws, concepts and issues. U.S. and international laws, regulations and standards will also be covered. The course will provide the student with a better understanding of how the complexity of this topic impacts economic, political, cultural and societal and opportunities in environment and energy management. Prerequisite: TCMG 560.  
*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 570 (TCMG 570/MGMT 570) **Foundation of Health Care Management and Administration.**

This course focuses on a systematic exploration of the health care system in the United States, government interactions and regulations, delivery systems, healthcare insurance and financing, health care providers, innovations in healthcare services and alternative strategies. Prerequisite: TCMG 523.  
*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 571 (TCMG 571/MGMT 571) **Foundations of Service Management and Engineering**

With the rapid growth of the services industry, this course integrates topics from economics, engineering, law, technology and organizational theory to deal with how firms change over time to become more service oriented or become service business and the mechanisms and tools by which they seek innovation and competitive advantage in the service sector. The services life cycle is reviewed. In addition, enabling technologies and how different disciplines help to answer questions about how business services combine, evolve, standardize and mature are covered. Prerequisite: Admissions to graduate studies.  
*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 573 (TCMG 573/MEEG 573) **Supply Chain Management**

The goal of this course is to cover not only high-level supply chain strategy and concepts, but also to give students a solid understanding of the analytical tools, to understand supply chain design, planning and operation and high it impacts the performance of a firm. It also conveys how supply chain drivers used on a conceptual level during supply chain design and operation lead to performance improvements. Prerequisite: Admissions to graduate studies.  
*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 574 (TCMG 574/MEEG 574) **Principles of Logistics**

This course presents materials management, logistics theory and concepts in today's manufacturing and commercial environments. It integrates all of the functional areas of the business as well as incorporating logistics into corporate operation. They are examined in light of how they interrelate with other functions for the firms. Prerequisite: ENGR

111, ENGR 300 and Admissions to graduate studies.  
*3 lecture hours; 3 semester hours*

## TECHNOLOGY MANAGEMENT 597AB **Master's Project**

A capstone course dealing with the development and implementation of business strategy and plan within a framework of ethical decision-making, globalization and managing accelerating change. It tests the capability of the student to apply and integrate all prior graduate learning to solve actual strategic management problems, develop a business plan and conduct organizational performance and governance assessments. The final project of this course is project-based and shall constitute, therefore, an outcome assessment of what the student has learned in the MS - TM program. Prerequisite: Final semester for completion the of MS - TM Program  
*3-6 semester hours*

## TECHNOLOGY MANAGEMENT 597 C **Masters Project (Completion)**

Topics to be arranged. Prerequisite: Approval of the Director, TM Program.  
*1 semester hour*

## TECHNOLOGY MANAGEMENT 598 **Thesis in Technology Management**

Completion of a report based on field, library and institutional research to demonstrate ability to conduct investigations in a technology management discipline. Approval of the Director, TM Program.  
*3- 6 semester hours*

## TECHNOLOGY MANAGEMENT 599 **Independent Study in Technology Management**

This course is reserved for a special project that cannot be done any other way and to help a student complete the MS when no other alternative is available. Prerequisite: Approval of the Director, TM Program.  
*3 semester hours*

