

**Cost per credit hour - College (A&S) & (Eng) \$645 + \$100 online fee
Cost per credit hour - Business Courses - \$840 + \$100 online fee**

ADMISSION AND REGISTRATION

[NOTE: Only officially admitted students are eligible to register for Lehigh University courses for academic credit] Admitted students must register using **LESN GRADUATE REGISTRATION FORM** under <http://www.lesn.lehigh.edu> or contact the Lehigh Office of [Distance Education](#) at 610-758-6210/e-mail rjm0@lehigh.edu. **Alternate instructions for registration will be sent to MBA AND MSE students.** Follow payment instructions included with registration form

- LESN-Online Spring course registration deadline – 1/11/10
- Students seeking admission should contact the Lehigh Office of Distance Education at 610-758-6210, e-mail rjm0@lehigh.edu. Spring 2010 admission application deadline – See program listing for specific dates
- Spring semester runs from 1/18/10 thru 4/30/10. **Unless otherwise noted, all courses will be available week of 1/18/10.**

Textbooks may be ordered directly through the Lehigh University online link to the bookstore from www.lesn.lehigh.edu under “forms” or going directly to the website: <http://lehigh.edu/bookstore>

BUSINESS

ECO 401-D10 (CRN#11611). Basic Statistics for Business and Economics (3)

Descriptive statistics, probability and probability distributions, estimation, hypothesis testing, correlation and regression, chi-square analysis and analysis of variance. Computer applications.

Instructor: Prof. Robert Thornton

e-mail: rjt1@lehigh.edu

Phone: 610-758-3460

- Course includes approximately 36 hours of content, plus assignments.,
- **Textbook Required** – “*Basic Statistics for Business and Economics*,” Anderson, Sweeney, and Williams, South-Western, 9th edition, ISBN#0 324 20082 X.

GBUS 401-D10 (CRN#10813). Financial Reporting for Managers and Investors (3)

Corporate financial reporting under Generally Accepted Accounting Principles. Analysis and interpretation of financial statements: accrual accounting, balance sheet valuation, income determination and cash flow analysis. Profit manipulation, window dressing and “creative accounting” through accounting policy choices. Fraudulent financial reporting, uses and limitations of accounting information. Accounting information as a tool for strategic decision making.

Instructor: Professor Gary Smith

e-mail: gas205@lehigh.edu

Phone: 610-758-5963

- Course includes approximately 36 hours of content, plus assignments
- **Textbooks Required** – “*Financial Accounting in An Economic Context*”, Jamie Pratt, 6th Ed., by John Wiley & Sons, Inc., ISBN#0-471-65528-7
- **Optional** : Study Guide to Accompany the above text by Joseph H. Anthony and Robin P. Clement. ISBN#0-471-73111-0.

GBUS 447-D10 (CRN#15805). Negotiations (3)

The course examines the behavioral foundations for the negotiation process. Topics include: The negotiation process, negotiation planning, power in negotiations, communications in negotiations, tactics, concepts of win-win and win-lose, social styles, individual and team negotiations, ethical considerations, cultural differences, negotiating in sole source (customer) situations, using third parties.

Instructor: Prof. R. Giambatista

e-mail: rcg204@lehigh.edu

Phone: 610-758-5526

Additional Course Requirements:

1. Elluminate meetings – Monday evenings, time TBD
 2. Saturday, March 27, 2010 is REQUIRED ON CAMPUS
- Course includes approximately 36 hours of content, plus assignments.
 - **Textbook Required:** “*Negotiation: Readings, Exercises, and Cases (5th Edition)*”, Roy L. Lewicki, David M. Saunders, John W. Minton and Barry; Publisher: McGraw Hill/Irwin, 2003; ISBN#0-07-242965-8.

GBUS 455-D10 (CRN#14969). E-Business (3)

Implications of key information technologies used within and across businesses to conduct e-business, including customer relationship management, enterprise resource planning, on-line ordering and inventory management, supply chain management, and e-procurement systems, Data warehousing, data mining, intra-extranets, and knowledge management.

Instructor: Prof. Y. Yao

e-mail: yuy3@lehigh.edu

Phone: 610-758-6726

Additional Course Requirements:

1. Elluminate meetings – Wednesday evenings, time TBD
- Course includes approximately 36 hours of content, plus assignments
 - Text TBD

BIOLOGY

BIOS 471-D11 (CRN#16108)/CHM 471-D11 (CRN#16110). Eukaryotic Signal Transduction (3)

Biochemistry of selected eukaryotic processes including hormone chemistry, blood clotting, immunochemistry, vision chemistry, muscle chemistry and photosynthesis. The second part of the course will involve presentation and discussion of the current literature by class participants. **Prerequisite:** BIOS /CHM 372. BIOS 411 may also be used as an alternate prerequisite. Discussions will be through the discussion board in the blackboard website.

Instructor: Prof. Linda Lowe-Krentz

e-mail: ljl0@lehigh.edu

Phone: 610-758-5084

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Recommended:** “*Biology of Cancer*” – with CD, Weinberg, Publ: Garland, 1st Ed. '06; ISBN#15340761

CHEMISTRY

CHM 358-D10 (CRN#14583). Advanced Organic Chemistry (3)

Reaction mechanism types and supporting physical-chemical data. Classes of mechanisms include elimination, substitution, rearrangement, oxidation-reduction, enolate alkylations, and others. **Prerequisite:** one year of organic chemistry

Instructor of Record: Prof. Ned Heindel

Moderator: Prof. Roger Egolf

e-mail: rae4@psu.edu

- Course includes approximately 36 hours of content
- **Textbook Required:** Ahliwalia and Parashar “*Organic Reaction Mechanisms,*” 3RD EDITION, 2007, , Alpha Science Publishers, Oxford, UK ISBN #13: 978-1-84265-295-4

CHM 394-D11 (CRN#15754)/CHE 394-D11 (CRN#15755)/MAT 394-D11 (CRN#16063).Organic Polymer Sci I (3)

Organic chemistry of synthetic high polymers. The following topics will be covered- polymer nomenclature, properties, applications; functionality and reactivity of monomers and polymers; mechanism and kinetics of step-growth and chain-growth polymerization in homogeneous media; and a brief description of emulsion polymerization, copolymerization and polymer characterization.

Prerequisites: one year of physical chemistry and one year of organic chemistry

Instructor: Prof. Douglas Follweiler, Adjunct

e-mail: dmfollweiler@enter.net

- Includes approximately 36 hours of content, plus assignments
- **Textbook Required** – “*Polymer Chemistry,*” ISBN#0195124448, Malcolm Stevens, Publ: Oxford Univ Press

CHM 425-D10 (CRN#14593). Pharmaceutical Regulatory Affairs I: Drug Discovery to Approval (3)

This course is one of four courses required to fulfill the requirements for a Certificate in Regulatory Affairs. It may be applied as one of the 400-level credits in any of the Chemistry or Pharmaceutical Chemistry degree tracks. Coverage includes the stages of the drug approval process and how these relate to the laboratory activities that provide the scientific basis for the New Drug Application (NDA). Lectures treat drug discovery, chemical process development of the active pharmaceutical ingredient (API), and pharmaceutical process development of the drug product. Regulatory issues in screening and testing, the management of the preclinical trials, and the management of clinical trials will be covered. The regulatory requirements for the production of the drug substance (API) from bench to pilot plant to full-scale manufacturing will also be covered. Included in the discussions will be Good Laboratory Practices (GLPs) and Good Manufacturing Practices (GMPs). The regulatory issues concerning the use of Contract Research Organizations (CROs) and Contract Manufacturing Organizations (CMOs) will also be treated. The processes for approvals of diagnostics and devices will also be covered. All topics are presented by practicing professionals in the regulatory affairs area. *This course is one of four courses required to fulfill the requirements for a Certificate in Regulatory Affairs. It may be applied as one of the 400-level credits in any of the Chemistry degree tracks.*

Instructor: Prof. Sam Niedbala

e-mail: san204@lehigh.edu

Phone: 610-758-6506

- Course includes approximately 36 hours of content, plus assignments
- **Textbooks Required:** (1) “*Development of FDA-Regulated Medical Products Prescription Drugs, Biologics, and Medical Devices,*” Elaine Whitmore, 2nd Ed., ASQC Publ., ISBN#0873896130 and (2) “*FDA Regulatory Affairs. A Guide for Prescription Drugs, Medical Devices and Biologics,*” by Douglas J. Pisano, David Mantus, '03 Edition, CRC Press, ISBN#1587160072.

CHM 428-D10 (CRN#14594). Pharmaceutical Regulatory Affairs II: Medical Devices and Combination Technologies: Concept to Commercialization (3)

Technological advancement in the medical and veterinary fields has fueled research and development of medical devices and products resulting from combination technologies. Each year, over 4,000 devices are reviewed by the U. S. Food & Drug Administration for efficacy and safety before being allowed to enter the marketplace. This course will review the history of medical device law and regulations in the U.S. It will also define current requirements of science needed to allow technologies to be developed according to regulations. Case studies will be used to educate participants on Design Controls, Quality System Regulations, Manufacturing Requirements and International Harmonization. Specific content may include Nucleic Acid Diagnostics, Cardiovascular Stents, Drug Delivery, Cancer Diagnostics, and Consumer Self-Testing. Students will also use knowledge gained to prepare class presentations to address current issues within the field.

This course is one of four courses required to fulfill the requirements for a Certificate in Regulatory Affairs. It may be applied as one of the 400-level credits in any of the Chemistry degree tracks.

Instructor: Prof. Sam Niedbala

e-mail: san204@lehigh.edu

Phone: 610-758-6506

- Course includes approximately 36 hours of content, plus assignments
- **Textbooks Required:** (1) *“Development of FDA-Regulated Medical Products, Prescription Drugs, Biologics, and Medical Devices”* by Elaine Whitmore; (2) *“Mastering and Managing the FDA Maze”* by Gordon Harnack, '99 Edition, ASQC Publ., ISBN#0873894553.

CHM 432-D10 (CRN#14595). Chemometrics (3)

Mathematical and statistical methods for experimental design, calibration, signal resolution, and instrument control and optimization. Computer program “Matlab” will be used (the student version of Matlab is sufficient).

Instructor: Prof. James Roberts

e-mail: james.roberts@lehigh.edu

Phone: 610-758-4841

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Required:** *Chemometrics*, ISBN#0471124516, Kenneth Beebe, 1st edition, 1998, Publisher: Wiley & Sons. “Matlab” computer program is also needed for this course. To order the student version of Matlab, please go to: <http://www.mathworks.com/store/platformReleaseStuSubmit.doc>

CHM 455-D10 (CRN#15760). Organic Reactions (3)

An intensive study of modern synthetic organic chemistry using natural products as the target systems. Retrosynthetic strategies for polyfunctional molecules and analysis of the mechanisms which underlie those syntheses. Studies on laboratory and process level pathways to generate alkaloids, mono-terpenes, di-terpenes, and tri-terpenes which have pharmaceutical or fragrance utilities.

Instructor of Record: Ned D. Heindel

Moderators: Michael Britten-Kelly

e-mail: BrittenKelly@netscape.net

Pete Kennewell

e-mail: pete@kennewell5855.fsnet.co.uk

- Course includes approximately 36 hours of content
- **Textbook Required – This book will be sent to you on a “CD” because the second edition is no longer in print.** Michael B. Smith’s *“Organic Synthesis,”* 2nd edition, McGraw-Hill Publishers ISBN#007048242x

CHM 456-D11 (CRN#12693). Spectral Analysis (3)/CHM 458-D11 (CRN#11632). Spectral Analysis Problem Solving (1)

Use of data from nuclear magnetic resonance, infrared, ultraviolet, and mass spectrometric techniques for the determination of structure of organic compounds. Emphasis on information from one- and two-dimensional proton and carbon NMR and a mechanistic interpretation of data from mass spectrometry. **Chem 458:** Intensive study and practice in determining structure relying on data collected using modern techniques as described in the current literature. This must be taken as a 4-credit course but must be registered separately as CHM 456 (3 credits) and CHM 458 (1 credit).

Instructor: Professor Natalie Foster

e-mail: nf00@lehigh.edu

Phone: 610-758-3646

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Required:** *“Spectrophotometric Identification of Organic Compounds,”* R M Silverstein, F X Webster, 7th Ed., J. Wiley (2005) ISBN#978-047-1393627

CHM 471-D11 (CRN#16110)/BIOS 471-D11 (CRN#16108). Eukaryotic Biochemistry (3)

Biochemistry of selected eukaryotic processes including hormone chemistry, blood clotting, immunochemistry, vision chemistry, muscle chemistry and photosynthesis. The second part of the course will involve presentation and discussion of the current literature by class participants. **Prerequisite:** BIOS /CHM 372. BIOS 411 may also be used as an alternate prerequisite. Discussions will be through the discussion board in the blackboard website.

Instructor: Prof. Linda Lowe-Krentz

e-mail: ljl0@lehigh.edu

Phone: 610-758-5084

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Recommended:** *“Biology of Cancer”* – with CD, Weinberg, Publ: Garland, 1st Ed. '06; ISBN#15340761

CHM 477-D10 (#12696). Toxicological Principles for the Pharmaceutical Industry (3)

The key to the successful process of drug development is the measurement, mechanistic understanding, and pharmacological interpretation of the biological effects of the promising new drug substance. How a candidate substance impacts a mammal-and ultimately man-in all major organ systems must be understood before the pharmaceutical goes forward to registry. This course has been especially organized for the students of Lehigh University's Distance Education program by Rutgers University toxicologist, Dr. Diane E. Heck. The course is team-taught by toxicologists and pharmacologists from pharmaceutical industry and from academia. Any BS/BA graduate in the biological, chemical, and pharmaceutical sciences should have appropriate academic preparation for this course. Undergraduate organic chemistry and a minimum of one-semester of biochemistry would be essential.

Instructor of Record: Prof. Ned Heindel **Moderator:** Dr. Carol Gardner **e-mail:** cgardner@eohsi.rutgers.edu
Co-Moderator: Dr. Joshua Gray **e-mail:** Joshua.p.gray@uscga.edu

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Required:** "Molecular Toxicology," 2nd ed., Josephy and Mannervik, 2006 .

CHM 485-D10 (CRN#14558)/ChE 485-D10 (CRN#14546)/MAT 485-D10 (CRN#14557). Polymer Blends and Composites (3)

This course will emphasize polymer blends and but will also cover polymeric composites. The polymer blends part will cover the fundamentals including thermodynamics, phase behavior and phase separation characteristics. In addition, specific lectures will emphasize compatibilization methods for optimizing polymer blends, types of various polymer blends, properties and applications. Composite lectures will cover particulate and fiber-filled systems. Prerequisite: any introductory course in polymers

Moderator: Prof. Lloyd Robeson, Adjunct **e-mail:** lesrob2@verizon.net **Phone:** 610-481-0117

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Required:** "Polymer Blends:A Comprehensive Review" (L.M. Robeson;Hanser, 2007; ISBN:978-3-446-22569-5

ENGINEERING

CHE 342-D11 (CRN#16113)/442-D11 (CRN#15765). Biotechnology II (3)

Engineering design and analysis of the unit operations used in the recovery and purification of products manufactured by the biotechnology industries. Requirements for product finishing and waste handling will be addressed. In order to receive 400-level credits, the student must do an additional, more advanced term project, as defined at the beginning of the course. Closed to students who have taken ChE 342.

Instructor: Prof. James Hsu **e-mail:** jth0@lehigh.edu **Phone:** 610-758-4257

- Course includes approximately 36 hours of contact
- **Textbook Required:** "Bioseparations Science and Eng.", 3rd Ed., Harrison, Roger D./Day, Trevor G./Petrides, Demetri

CHE 394-D11 (CRN#15755)/ CHM 394-D11 (CRN#15754)/MAT 394-D11 (CRN#16063).Organic Polymer Sci I (3)

Organic chemistry of synthetic high polymers. The following topics will be covered- polymer nomenclature, properties, applications; functionality and reactivity of monomers and polymers; mechanism and kinetics of step-growth and chain-growth polymerization in homogeneous media; and a brief description of emulsion polymerization, copolymerization and polymer characterization.

Prerequisites: one year of physical chemistry and one year of organic chemistry

Instructor: Prof. Douglas Follweiler, Adjunct **e-mail:** dmfollweiler@enter.net

- Includes approximately 36 hours of content, plus assignments
- **Textbook Required** – "Polymer Chemistry," ISBN#0195124448, Malcolm Stevens, Publ: Oxford Univ Press

CHE 415-D11 (CRN#). Transport Processes (4)

A combined study of the fundamentals of momentum transport, energy transport and mass transport and the analogies between them. Evaluation of transport coefficients for single and multicomponent systems. Analysis of transport phenomena through the equations of continuity, motion, and energy. Prerequisite: CHE 452 or equivalent.

Instructor: Prof. Mark Snyder **e-mail:** masn00@lehigh.edu

- Includes approximately 48 hours of content, plus assignments
- **Textbook Required:** William M. Deen, "Analysis of Transport Phenomena," Oxford Univ. Press, NY, 1998.

CHE 430-D10 (CRN#15763). Mass Transfer (3)

Theory and developments of the basic diffusion and mass transfer equations and transfer coefficients including simultaneous heat and mass transfer, chemical reaction and dispersion effects. Applications to various Industrially important operations including continuous contact mass transfer, absorption, humidification, etc. Brief coverage of equilibrium stage operations as applied to absorption and to binary and multicomponent distillation.

Instructor: Prof. Hugo Caram **e-mail:** hsc0@lehigh.edu **Phone:** 610-758-4259

- Course includes approximately 36 hours of content
- **Textbook Required**–"DIFFUSION-Mass Transfer in Fluid Systems," Cussler, Second Edition, Cambridge Univty Press, 2002.

CHE 442-D11 (CRN#15765). Biotechnology II (3)

See course description listed for ChE 342. In order to receive 400-level credits, the student must do an additional, more advanced term project, as defined at the beginning of the course. Closed to students who have taken ChE 342.

Instructor: Prof. James Hsu

e-mail: jth0@lehigh.edu

Phone: 610-758-4257

- Course includes approximately 36 hours of contact
- **Textbook Required:** "Bioseparations Science and Eng", 3rd Ed., Harrison, Roger D./Day, Trevor G./Petrides, Demetr

CHE 485-D10 (CRN#14546)/CHM 485-D10 (CRN#14558)/MAT 485-D10 (CRN#14557). Polymer Blends and Composites (3)

This course will emphasize polymer blends and but will also cover polymeric composites. The polymer blends part will cover the fundamentals including thermodynamics, phase behavior and phase separation characteristics. In addition, specific lectures will emphasize compatibilization methods for optimizing polymer blends, types of various polymer blends, properties and applications.

Composite lectures will cover particulate and fiber-filled systems. Prerequisite: any introductory course in polymers

Moderator: Prof. Lloyd Robeson, Adjunct

e-mail: lesrob2@verizon.net

Phone: 610-481-0117

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Required:** "Polymer Blends:A Comprehensive Review" (L.M. Robeson;Hanser, 2007; ISBN:978-3-446-22569-5

IE 332-D11 (CRN#14922). Product Quality (3)

Introduction to engineering methods for monitoring, control, and improvement of quality. Statistical models of quality measurements, statistical process control, acceptance sampling, and quality management principles.

Instructor: Prof. John Adams

e-mail: jwa0@lehigh.edu

Phone: 610-758-4032

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Required:** "Intro to Statistical Quality Control," 6th ed., ISBN#0-4-7016992-6

IE 362-D11 (CRN#14578)/MSE 362-D11 (CRN#14580). Logistics and Supply Chain Management (3)

Modeling and analysis of supply chain design, operations, and management. Analytical framework for logistics and supply chains, demand and supply planning, inventory control and warehouse management, transportation, logistics network design, supply chain coordination, and financial factors. Students complete case studies and a comprehensive final project. This course may be used as a substitute for IE 422.

Instructor: Prof. Mikell Groover

e-mail: mpg0@lehigh.edu

Phone: 610-758-4030

- Course includes approximately 36 hours of contact
- **Textbook Required:** "Business Logistics Management," Ballou, 5th Edition, Pearson Prentice Hall, 2004

IE 409-D11 (CRN#16061). Time Series Analysis (3)

Theory and applications of an approach to process modeling, analysis, prediction, and control based on an ordered sequence of observed data. Single or multiple time series are used to obtain scalar or vector difference/differential equations describing a variety of physical and economic systems.

Instructor: Prof. Frank Curtis

e-mail: fec309@lehigh.edu

Phone: 610-758-4879

- Course includes approximately 36 hours of contact
- **Textbook Required:**

MSE 362-D11 (CRN#14580)/IE 362-D11 (CRN#14578). Logistics and Supply Chain Management (3)

Modeling and analysis of supply chain design, operations, and management. Analytical framework for logistics and supply chains, demand and supply planning, inventory control and warehouse management, transportation, logistics network design, supply chain coordination, and financial factors. Students complete case studies and a comprehensive final project.

Instructor: Prof. Mikell Groover

e-mail: mpg0@lehigh.edu

Phone: 610-758-4030

- Course includes approximately 36 hours of contact
- **Textbook Required:** "Business Logistics Management,"w/CD; Ballou, 5th Edition, Pearson Prentice Hall, 2004; ISBN#978-0-1-3107659-4;0-1-3107659-0

MSE 446-D11 (CRN#15770). International Supply Chain Management (3)

Financial and managerial issues. Evaluation, selection, development and management of suppliers; business models, financial reporting strategies, earnings, quality, risk assessment and internal control, team based new product development. Selected readings, case studies, discussions, lectures, group projects, and presentations.

Instructor: Prof. Alan Feiertag, Adjunct

e-mail: adf5@lehigh.edu

Phone: 610- 351-8681

- Course includes approximately 36 hours of contact
- **Textbook Required:**

MSE 482-D11 (CRN#15772). Aspects of Sustainable Systems Design (3)

Design of sustainable systems for manufacturing that fulfill human needs and generate wealth. Demographic, ecological, economic, environmental, ergonomic, health and global or local socio-political impacts on design and operation of future systems. Conservation of resources in the design, manufacture and use of products, processes, and implementation systems; life cycle engineering, reclamation, recycling, remanufacture. Research-based term paper.

Instructor: Prof. Keith Gardiner

e-mail: kg03@lehigh.edu

Phone: 610-758-5070

- Course includes approximately 36 hours of contact
- **Textbook Required:**

EMA 350-D10 (CRN#13853). Elements of Engineering Analysis (3)

Engineering Mathematics (EMA) 350 is designed to be a refresher of mathematics and computation skills for graduate students who have been away from formal college level studies for some time. After completing this course students should be able to successfully participate in those graduate courses of the department which heavily utilize mathematics and computations. Examples of these courses are ME 442 (Math Methods), ME 443 (Advanced Math Methods), ME 413 (Numerical Methods), ME 423 (Heat & Mass Transfer), etc. This course may be appropriate to students in other departments of RCEAS needing some refresher course in Math and Computations. **Please Note:** The EMA 350-D10 will count towards any graduate degree within the constraints of the program. By the end of EMA 350 students will know how to perform the following tasks. By the end of EMA 250/350 students will know how to perform the following tasks:

- Solving analytically basic differential equations
- Utilizing mathematical modeling to study basic engineering problems
- Working with vectors, arrays, matrices, determinants and performing mathematical operations with them.
- Solving systems of linear algebraic equations using analytical methods as well as numerical methods via MATLAB.
- Using MATLAB and Excel to solve and plot the results of certain simple engineering problems.
- Writing a computer program using either C++ or MATLAB in the context of an engineering problem.
- Using numerical methods in the following tasks:
 - solving transcendental equations
 - curve fitting data
 - differentiating and integrating functions
 - solving simple differential equations

Instructor: Prof. Jacob Kazakia

e-mail: jvk0@lehigh.edu

Phone: 610-758-3785

- Course includes approximately 36 hours of content
- **Textbooks Required:** (1) *“Mathematical Methods in Chemical Engineering,”* 2nd edition, Jenson & Jeffreys (this book will be provided through Distance Education with the cost of a handling fee to you). Upon completion the book may be returned to Distance Education or you may have the option of purchasing the book from Distance Education at cost; (2) *“The Mathematics Companion: Essential and Advanced Mathematics for Scientists and Engineers,”* by A. C. Fischer-Cripps; (3) *“Essential C++ for Engineers and Scientists,”* 2nd edition by Jeri Hanly can be purchased on Lehigh’s Bookstore website; (C++ compiler will be sent to you on CD); (4) *“Getting Started with MATLAB 7,”* by Rudra Pratap (most of you may already use Matlab or instructions to access this program will be sent to you).

ME 309-D11 (CRN#15779)/MAT 309-D11 (CRN#15350). Composite Materials (3)

The principles and technology of composite materials. Processing, properties, and structural applications of composites, with emphasis on fiber-reinforced polymers.

Instructor: Prof. Ray Pearson

e-mail: rp02@lehigh.edu

Phone: 610-758-3857

Prof. J. L. Grenestedt

e-mail: jog5@lehigh.edu

Phone: 610-758-4129

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Required:** *“Composite Materials: Engineering and Science,”* by F. L. Matthews and R. D. Rawlings: 1st Ed., published by Chapman & Hall: New York, reprinted in 2006, ISBN#185573473.

ME 423-D10 (CRN#13215). Heat and Mass Transfer (3)

This course is a first graduate course in the basic concepts of heat and mass transfer, providing a broad coverage of key areas in diffusion, conduction, convection, heat and mass transfer, and radiation. Topics covered include: the conservation equations, steady and transient diffusion and conduction, periodic diffusion, melting and solidification problems, numerical methods, turbulent convection, transpiration and film cooling, free convection, heat transfer with phase change, heat exchanges, radiation, mixed mode heat and mass transfer.

Instructor: Prof. Alparslan Oztekin

e-mail: alo2@lehigh.edu

Phone: 610-758-43432

- Course includes approximately 36 hours of content, plus assignments
- **Textbooks Required:** *“Fundamentals of Heat & Mass Trans. W/user guide. & C D,”* Incropera, 5th ed., '02, Wiley, ISBN#047120448X multi courses; *“Fundamentals of Heat & Mass Transfer-Text,”* 5th ed., '02, ISBN#047138650-2 multi course

ME 402-D11 (CRN#13859)/MAT 402-D11 (CRN#15985). Advanced Manufacturing Science (3)

The course focuses on the fundamental science-base underlying manufacturing processes, and applying that science base to develop knowledge and tools suitable for industrial utilization. Selected manufacturing processes representing the general classes of material removal, material deformation, material phase change, material flow, and material joining are addressed. Students create computer-based process simulation tools independently as well as utilize leading commercial process simulation packages. The use of the MATLAB computer program will also be used for this course. Laboratory experiences are included throughout the course.

Instructor: Prof. John Coulter

e-mail: jc0i@lehigh.edu

Phone: 610-758-6310

- Course includes approximately 36 hours of content, plus assignments
- **No textbook required**

MECH 413-D10 (CRN#15782). Fracture Mechanics (3)

Elementary and advanced fracture mechanics concepts; analytical modeling; fracture toughness concept; fracture toughness testing; calculation of stress intensity factors; fatigue crack growth and environmental effects; computational methods in fracture mechanics; nonlinear fracture mechanics; fracture of composite structures; application of fracture mechanics to design. Prerequisites: MATH 205, MECH 305 or equivalent course in advanced mechanics of materials.

Instructor: Prof. Herman Nied

e-mail: hfn2@lehigh.edu

Phone: 610-758-4128

- Course includes approximately 36 hours of content, plus assignments
- **Textbook Required:** “*Principles of Fracture Mechanics*,” Sanford, R.J., Prentice Hall, 2003, ISBN#0-13-092992-1. The book comes in a paperback edition. Several reference books will be recommended

MECH 425-D10 (CRN#15783). Analytical Methods in Dynamics and Vibrations (3)

This course is a first graduate course in dynamics and vibrations. It treats three-dimensional rigid body motion by variational principles. Discrete modal analysis and continuous modal analysis of one-dimensional systems plus finite-element formulation of numerical problems constitutes about one-third of the course. There is a brief treatment of advanced impact. Use of symbolic computer codes is encouraged.

Instructor: Prof. D. Perreira

e-mail: ndp0@lehigh.edu

Phone: 610-758-3791

- Course includes approximately 36 hours of content, plus assignments
- **No textbook required**

11/4/09