LEHIGH UNIVERSITY
DISTANCE EDUCATION

SATELLITE CREDIT COURSES
FALL 2009 (8/24/09 – 12/04/09)

Cost per credit hour - $645 per credit hour
Business/credit hour - $840 per credit hour

Please check on www.distance.lehigh.edu for scheduled revisions and dates updates

BUSINESS/MBA

CANCELLED ECO 358-D10 (CRN#45619)/IE 358-D10 (CRN#45618). Game Theory (3)
A mathematical analysis of how people interact in strategic situations. Applications include strategic pricing, negotiations, voting, contracts and economic incentives, and environmental issues.
***Instructor*: Prof. Eugene Perevalov** **M, W, F** **1:10 – 2:00 p.m.** **EUP2** **X84031** **PL410**

GBUS 481-D10 (CRN#45643)/MSE 481-D10 (CRN#45590). Technology Operation & Comp. Strategy (3)
Interrelationships among advanced manufacturing management, technology and competitive strategy of the firm. Topics to include industry analysis and competitiveness; competitive strategy formulation and implementation; value chain analysis; manufacturing and technology strategy; manufacturing's contribution to competitive advantage in quality, cost, variety and new product availability; segmentation and substitution; vertical integration.
***Instructor*: Prof. Theodore Schlie** **Tuesday** **6:30 – 9:30 p.m.** **TES3** **X85341** **E301**

MBA 401-D10 (CRN#45090). Introduction to the Organization and its Environment (2)
This MBA Core Course will provide a thorough understanding of business organizations and will clairfy ways middle and senior managers can create and sustain organizational competitive advantage. The course examines the organization from an overall perspective within the context of the firm's internal and external environment. The second aspect of this course deals with the ability to communicate effectively in today's business and professional environment. Students will examine and practice the written and verbal communications strategies and skills that are esssential to their success in business.
SPECIAL DATES: **Course meets from Monday, August 24 through Monday, October 5**
***Instructor*: Prof. Michael Santoro** **Monday** **6:00 – 9:30 p.m.** **MDS8** **X86414** **E301**
Prof.. Kathleen Clayton **KLC7** **X84010**

MBA 403-D10 (CRN#45780). Managing Information (4)
An MBA core course dealing with concepts and methods involved in the collection, organization and dissemination of information that helps managers make operational and strategic decisions and examines enterprise-wide impacts of local decisions. Revenue, cost, time and quality-based information are accorded equal emphasis, while students are exposed to alternative evaluation methods for decisions related to different parts of the value chain. Topics include:activity-based costing; activity-based management; trans-action analysis; operational and strategic investment analysis for short life-cycle investments; evaluation of uncertainty, risk and ambiguity; metrics development; compensation policies; segment evaluation methods; target costing and functional analysis; quality function deploym,ent; total cost of ownership; and transfer pricing. In addition, the course deals with :information technology enablers which allow firms to improve value delivered to customers; and evaluation and management of emerging forms of cooperation, such as joint ventures and project based strategic alliances. **Prerequisites**: MBA 401, GBUS 401 and GECO 401 or equivalents.
***Instructor*: Prof. Y. Yao** **Wednesday** **6:00 – 9:30 p.m.** **YUY3** **X86726** **E301**
Prof. David Hinrichs **DJH404** **X84674**

MBA 404-D10 (CRN#45960). Managing Products and Services (4)
An MBA core course focusing on the management of products and services within a firm's value chain. The course addresses exceeding customer expectations, establishing total quality as the core foundation, developing a strong customer focus, creating value through supply chain management, developing new products for competitive advantage, matching aggregate supply with customer demand, and designing market channels & influencing customers. Prerequisite:MBA 401
***Instructor:* Prof. Robert Kuchta** **Thursday** **6:00–9:30 p.m.** **ROK8** **X86495** **E301**
Prof. Nada Sanders

BIOLOGY

BIOS 371-D11 (CRN#45674)/CHM 371-D11 (CRN#45675). Elements of Biochemistry I (3)
A general study of carbohydrates, proteins, lipids, nucleic acids, and other biological substances and their importance in life processes. Protein and enzyme chemistry are emphasized. **Prerequisite**: one year of organic chemistry. Distance students only.
***Instructor*: Prof. Michael Behe T & R 9:20 – 10:35 a.m. MJB1 X83474 E301**

BIOS 407-D10 (CRN#45676). Research in Biological Sciences (1-9)
Laboratory investigations in one of the department's research areas.
Instructor: Contact your research advisor for permission to register. Please note your research advisor on registration form

BIOS 411-D10 (CRN#45682). Advanced Cell Biology (3)
Cell structure and biochemistry, as related to specialized cell functions.
***Instructor:* Prof. Robert Skibbens T & R 10:45 – 12:00 noon RVS3 X86268 E301**

BIOS 422-D10 (CRN#45681). Molecular Cell Biology II (3)
Molecular aspects of gene expression, including genome structure and replication, RNA synthesis/processing, and protein synthesis. Attendance in the satellite class is required. **Prerequisite**: BIOS 345 or equivalent.
***Instructor:* Prof. Michael Kuchka Wednesday 1:10 – 4:00 p.m. MRK5 X83687 E301**

BIOS 427-D10 (CRN#45683). Techniques in Cell and Molecular Biology (3)
Independent research with approval of advisor. Laboratory experiences in three or more cell and molecular biological techniques: gel electrophoresis of nucleic acids/proteins; polymerase chain reaction; DNA/RNA sequencing; molecular hybridization techniques; fluorescence microscopy; confocal microscopy; flow cytometry; electron microscopy tissue preparation; immunological detection methods; molecular cloning techniques; tissue culture methods; and autoradiography.
***Contact* Prof. Vassie Ware for information and approval. VCW0 X83690**

BIOS 490-D10 (CRN#45684). Thesis (1-6)

BIOS 499-D12 (CRN#45390). Dissertation (1-15)

CHEMISTRY

CHM 371-D11 (CRN#45675)/BIOS 371-D11 (CRN#45674). Elements of Biochemistry I (3)
A general study of carbohydrates, proteins, lipids, nucleic acids, and other biological substances and their importance in life processes. Protein and enzyme chemistry are emphasized. **Prerequisite**: one year of organic chemistry. Distance students only.
***Instructor*: Prof. Michael Behe T & R 9:20 – 10:35 a.m. MJB1 X83474 E301**

CHM 393-D10(CRN#45645)/CHE 393-D10 (CRN#45583)/MAT 393-D10 (CRN#45581). Physical Polymer Science (3).
Structural and physical aspects of polymers (organic, inorganic, natural). Molecular and atomic basis for polymer properties and behavior. Characteristics of glassy, crystalline, and paracrystalline states (including visoelastic and relaxation behavior) for single-and muilti-component systems. Thermodynamics and kinetics of transition phenomena. Structure, morphology, and behavior. Prerequisite: 1 year of physical chemistry
***Instructor*: Prof. Ray Pearson M & W 11:10 – 12:25 p.m. RP02 X83857 PL410**

CHM 421-D10 (CRN#40964). Chemistry Research (1-6)
Research in one of the following fields of chemistry: analytical, inorganic, organic, physical, polymer, biochemistry.
Contact: **Dr. Rebecca Miller. No book required. X83676 RSM4**

CHM 481-D10 (CRN#45739). Chemistry Seminar (1)
Student presentations on current research topics in the student's discipline but not on subjects close to the thesis. A one-hour presentation. Enrollment Capacity – 5 students. **To be arranged with Dr. Robert Flowers, Chairperson. X84048 ROF2**

CHM 490-D10 (CRN#45748). Chemistry Thesis (1-6)
Should be used if you are graduating and are finished with your coursework. You must be registered in the semester you intend to graduate. **Please contact Dr. Rebecca Miller if you have any questions. X83676 RSM4**

CHM 492-D10 (#46208)/CHE 492-D10 (#45611)/MAT 492-D10 (CRN#46209). Transport Processes in Polymers (3)
Transport processes in polymers cover a wide variety of subjects relevant to the utility of polymers in a myriad of applications. One of the major areas to be covered in these lectures involves the transport of gases and liquids through polymeric membranes. This

area involves the diffusion, solubility and permeability in polymeric films and covers barrier properties for packaging applications, membrane separation, water purification processes. Membrane separation processes will be emphasized as the potential as a unit operation is increasingly important for key separation processes due to the low energy requirements relative to more conventional processes. Other transport processes of importance include thermal conductivity and electrical conductivity which will also be discussed. In the emerging technologies also involving polymers, proton transport (for fuel cell applications), lithium ion transport (for lithium battery applications) and hole and electron transport for advanced optoelectronic applications (light emitting diodes and photovoltaic devices) are increasing important and will be covered. The major emphasis will be placed on gas permeability and water purification processes involving polymeric membranes including the various membrane fabrication processes. The lectures will emphasize the technology with the basic fundamentals of each process also covered.

***Instructor*: Prof. Lloyd Robeson, Adj Tuesday 6:00 – 9:00 p.m. lesrob2@verizon.net PL410**

CHM 499-D10 (CRN#45750). Chemistry Dissertation (1-15)

To be used by PhD students only. Please contact Dr. Rebecca Miller if you have any questions. X83676 RSM4

ENGINEERING

CHE 341-D10 (CRN#45596)/CHE 441-D10 (CRN#45600). Biotechnology I (3)

Applications of material and energy balances; heat, mass, and momentum transfer; enzyme and microbial kinetics; and mathematical modeling to the engineering design and scale-up of bio-reactor systems. Additional work will be required if taken as CHE 441-D10. Please specify which level you want to take this course.

***Instructor*: Prof. James Hsu M & W 4:30 – 5:45 p.m. JTH0 X84257 PL410**

CHE 393-D10(CRN#45583)/MAT 393-D10(CRN#45581)/CHM 393-D10(CRN#45645). Physical Polymer Science (3)

Structural and physical aspects of polymers (organic, inorganic, natural). Molecular and atomic basis for polymer properties and behavior. Characteristics of glassy, crystalline, and paracrystalline states (including visoelastic and relaxation behavior) for single-and muilti-component systems. Thermodynamics and kinetics of transition phenomena. Structure, morphology, and behavior. Prerequisite: 1 year of physical chemistry

***Instructor*: Prof. Ray Pearson M & W 11:10 – 12:25 p.m. RP02 X83857 PL410**

CANCELLED CHE 428-D10 (CRN#45606). Rheology (3)

An intensive study of momentum transfer in elastic viscous liquids. Rheological behavior of solution and bulk phase polymers with emphasis on the effect of molecular weight, molecular weight distribution and branching. Derivation of constitutive equations based on both molecular theories and continuum mechanics principles. Application of the momentum equation and selected constitutive equations to geometries associated with viscometric flows.

***Instructor*: Prof. A. J. McHugh T & R 1:35 – 2:50 p.m. AJM8 X85218 E301**

CHE 451-D10 (CRN#). Problems in Research (1)

Study and discussion of optimal planning of experiments and analysis of experimental data. Discussion of more common and more difficult techniques in the execution of chemical engineering research.

***Instructor:* Prof. James Hsu JTH0 X84257**

CHE 452 (CRN#45607)/ME 452 (CRN#45608)/ENGR 452-D10 (CRN#46123). Mathematical Methods in Eng (3)

Analytical techniques relevant to the engineering sciences are described. Vector spaces; eigenvalues, eigenvectors. Linear ordinary differential equations; diagonalizable and non-diagonalizable systems. Inhomogeneous linear systems; variation of parameters. Non-linear systems; stability; phase plane. Series solutions of ordinary differential equations; special functions. Laplace and Fourier transforms; application to partial differential equations and integral equations. Sturm-Liouville theory. Finite Fourier transforms; planar, cylindrical and spherical geometries.

***Instructor*: Prof. Philip Blythe T & R 4:15 – 5:30 p.m. PAB0 X83782 PL410**

CHE 492-D10 (#45611)/CHM 492-D10 (#46208)/MAT 492-D10 (CRN#46209). Transport Processes in Poly (3)

Transport processes in polymers cover a wide variety of subjects relevant to the utility of polymers in a myriad of applications. One of the major areas to be covered in these lectures involves the transport of gases and liquids through polymeric membranes. This area involves the diffusion, solubility and permeability in polymeric films and covers barrier properties for packaging applications, membrane separation, water purification processes. Membrane separation processes will be emphasized as the potential as a unit operation is increasingly important for key separation processes due to the low energy requirements relative to more conventional processes. Other transport processes of importance include thermal conductivity and electrical conductivity which will also be discussed. In the emerging technologies also involving polymers, proton transport (for fuel cell applications), lithium ion transport (for lithium battery applications) and hole and electron transport for advanced optoelectronic applications (light emitting diodes and photovoltaic devices) are increasing important and will be covered. The major emphasis will be placed on gas permeability and water purification processes involving polymeric membranes including the various membrane fabrication processes. The lectures will emphasize the technology with the basic fundamentals of each process also covered.

***Instructor*: Prof. Lloyd Robeson, Adj Tuesday 6:00 – 9:00 p.m. lesrob2@verizon.net PL410**

CHE 499-D12 (CRN#45388). Dissertation (1-15)

CANCELLED IE 328-D10 (CRN#45617) Engineering Statistics (3)
Random variables, probability functions, expected values, statistical inference, hypothesis testing, regression and correlation, analysis of variance, introduction to design of experiments, and fundamentals of quality control. This course requires use of Minitab Software. "Minitab" computer program will also be needed for this course.
***Instructor*: Prof. Eugene Perevalov M,W,F 10:10 - 11:00 a.m. EUP2 X84031 PL410**

CANCELLED IE 358-D10 (CRN#45618)/ECO 358-D10 (CRN#45619). Game Theory (3)
A mathematical analysis of how people interact in strategic situations. Applications include strategic pricing, negotiations, voting, contracts and economic incentives, and environmental issues.
***Instructor*: Prof. Eugene Perevalov M,W,F 1:10 – 2:00 p.m. EUP2 X84031 PL410**

IE 410-D10 (CRN#45621). Design of Experiments (3)
Experimental procedures for sorting out important casual variables, finding optimum conditions, continuously improving processes, and trouble shooting. Applications to laboratory, pilot plant and factory. Prerequisites: Some statistical background and experimentation in prospect.
***Instructor*: Prof. Robert Storer T & R 9:20 – 10.35 a.m. RHS2 X84436 PL410**

CANCELLED IE 426-D10 (CRN#45623). Optimization Models and Applications (3)
Modeling and analysis of operations research problems using techniques form mathematical programming. Linear programming, integer programming, multi-criteria optimization, stochastic programming and nonlinear programming using an algebraic modeling language. This course is a version of IE 316 for graduate students, with research projects and advanced assignments. Closed to students who have taken IE 316. Prerequisite: IE 220 or equivalent background.
***Instructor*: Prof. Pietro Belotti T & R 1:10 – 2:25 p.m. PIB208 X83865 PL410**

IE 443-D10 (CRN#45586)/MSE 443-D10 (CRN#45584)/ME 450-D10 (CRN#45627). Automation & Production Sys (3)
Principles and analysis of manual and automated production systems for discrete parts and products. Cellular manufacturing, flexible manufacturing systems, transfer lines, manual and automated assembly systems, and quality control systems.
***Instructor*: Prof. Mikell P. Groover M & W 4:30 – 5:45 MPG0 X84030 E301**

MAT 393-D10 (CRN#45581)/CHM 393-D10 (CRN#45645)/CHE 393-D10 (CRN#45583). Physical Polymer Sci (3)
Structural and physical aspects of polymers (organic, inorganic, natural). Molecular and atomic basis for polymer properties and behavior. Characteristics of glassy, crystalline, and paracrystalline states (including visoelastic and relaxation behavior) for single-and muilti-component systems. Thermodynamics and kinetics of transition phenomena. Structure, morphology, and behavior. Prerequisite: 1 year of physical chemistry
***Instructor*: Prof. Ray Pearson M & W 11:10 – 12:25 p.m. RP02 X83857 PL410**

MAT 490-D10 (CRN#46181). Thesis (1-6) RP02 X83857

MAT 492-D10(#46209)/CHE 492-D10/(#45611)/CHM 492-D10 (CRN#46208). Transport Processes in Polymers (3)
Transport processes in polymers cover a wide variety of subjects relevant to the utility of polymers in a myriad of applications. One of the major areas to be covered in these lectures involves the transport of gases and liquids through polymeric membranes. This area involves the diffusion, solubility and permeability in polymeric films and covers barrier properties for packaging applications, membrane separation, water purification processes. Membrane separation processes will be emphasized as the potential as a unit operation is increasingly important for key separation processes due to the low energy requirements relative to more conventional processes. Other transport processes of importance include thermal conductivity and electrical conductivity which will also be discussed. In the emerging technologies also involving polymers, proton transport (for fuel cell applications), lithium ion transport (for lithium battery applications) and hole and electron transport for advanced optoelectronic applications (light emitting diodes and photovoltaic devices) are increasing important and will be covered. The major emphasis will be placed on gas permeability and water purification processes involving polymeric membranes including the various membrane fabrication processes. The lectures will emphasize the technology with the basic fundamentals of each process also covered.
***Instructor*: Prof. Lloyd Robeson, Adj Tuesday 6:00 – 9:00 p.m. lesrob2@verizon.net PL410**

ME 385-D10 (CRN#45615)/485-D10 (CRN#45622). Polymer Processing (3)
An exploration of the science underlying polymer processes such as injection molding through a combination of theory development, practical analysis, and utilization of commercial software. Polymer chemistry and structure, material rheological

behavior, processing kinetics, molecular orientation development, process simulation software development, manufacturing defects, manufacturing window establishment, manufacturing process design, manufacturing process optimization. **Prerequisites:** (**ME 385:** Senior level standing in engineering or science). (**ME 485**: This course is a version of ME 385 for graduate students, with research projects and advanced assignments. Closed to students who have taken ME 385. Graduate level standing in engineering or science).

***Instructor*: Prof. John Coulter** **T & R** **10:45 – 12:00 noon** **JC0I** **X86310** **PL410**

ME 450-D10 (CRN#45627)/IE 443-D10 (CRN#45586)/MSE 443-D10 (CRN#45584). Automation & Production Sys (3)

Principles and analysis of manual and automated production systems for discrete parts and products. Cellular manufacturing, flexible manufacturing systems, transfer lines, manual and automated assembly systems, and quality control systems.

***Instructor*: Prof. Mikell P. Groover** **M & W** **4:30 – 5:45** **MPG0** **X84030** **E301**

ME 452 (CRN#45608)/CHE 452 (CRN#45607)/ENGR 452-D10 (CRN#46123). Mathematical Methods in Eng (3)

Analytical techniques relevant to the engineering sciences are described. Vector spaces; eigenvalues, eigenvectors. Linear ordinary differential equations; diagonalizable and non-diagonalizable systems. Inhomogeneous linear systems; variation of parameters. Non-linear systems; stability; phase plane. Series solutions of ordinary differential equations; special functions. Laplace and Fourier transforms; application to partial differential equations and integral equations. Sturm-Liouville theory. Finite Fourier transforms; planar, cylindrical and spherical geometries.

***Instructor*: Prof. Philip Blythe** **T & R** **4:15 – 5:30 p.m.** **PAB0** **X83782** **PL410**

ME 485-D10 (CRN#45622)/ME 385-D10 (CRN#45615). Polymer Processing (3)

An exploration of the science underlying polymer processes such as injection molding through a combination of theory development, practical analysis, and utilization of commercial software. Polymer chemistry and structure, material rheological behavior, processing kinetics, molecular orientation development, process simulation software development, manufacturing defects, manufacturing window establishment, manufacturing process design, manufacturing process optimization. **Prerequisites:** (**ME 385:** Senior level standing in engineering or science). (**ME 485**: This course is a version of ME 385 for graduate students, with research projects and advanced assignments. Closed to students who have taken ME 385. Graduate level standing in engineering or science).

***Instructor*: Prof. John Coulter** **T & R** **10:45 – 12:00 noon** **JC0I** **X86310** **PL410**

ME 490-D10 (CRN#45400). Thesis (1-3)

MECH 312-D10 (CRN#45652). Finite Element Analysis (3)

Basic concepts of analyzing general media (solids, fluids, heat transfer, etc.) with complicated boundaries. Emphasis on mechanical elements and structures. Element stiffness matrices by minimum potential energy. Isoparametric elements. Commercial software packages (ABAQUS, NISA) are used. In addition students develop and use their own finite elements codes. Applications to design. Prerequisite: MECH 12.

Instructor: Prof. Terry Delph **M,W,F** **8:10 – 9:00** **TJD1** **X84119** **PL410**

MSE 438-D10 (CRN#45568). Agile Organizations & Manufacturing Systems (3)

Analysis of the factors contributing to the success of manufacturing enterprises in an environment characterized by continuous and unpredictable change. Fundamentals of lean production; aspects of systems design, value stream analysis, flow, set-up and cycle time reduction, kaizen, elimination of waste. Fundamentals of agility:global enterprises, virtual organizations, adapting to change, mass customization, manufacturing flexibility, activity-based management.

***Instructor:* Profs Gardiner/Groover** **Thursday** **6:00 – 9:00 p.m.** **KG03 (X85070)** **MPG0 (84030)** **PL410**

MSE 443-D10 (CRN#45584)/ME 450-D10 (CRN#45627)/IE 443-D10 (CRN#45586). Automation & Production Sys (3)

Principles and analysis of manual and automated production systems for discrete parts and products. Cellular manufacturing, flexible manufacturing systems, transfer lines, manual and automated assembly systems, and quality control systems.

***Instructor*: Prof. Mikell P. Groover** **M & W** **4:30 – 5:45** **MPG0** **X84030** **E301**

MSE 451-D10 (CRN#42426). Manufacturing Systems Engineering Project (1-3)

***Advisor*: Prof. Keith Gardiner** **KG03** **X85070**

MSE 481-D10 (CRN#45590)/GBUS 481-D10 (CRN#45643). Technology Operation & Comp. Strategy (3)

Interrelationships among advanced manufacturing management, technology and competitive strategy of the firm. Topics to include industry analysis and competitiveness; competitive strategy formulation and implementation; value chain analysis; manufacturing and technology strategy; manufacturing's contribution to competitive advantage in quality, cost, variety and new product availability; segmentation and substitution; vertical integration.

***Instructor*: Prof. Theodore Schlie** **Tuesday** **6:30 – 9:30 p.m.** **TES3** **X85341** **E301**

MSE 490-D10 (CRN#42427). Manufacturing Systems Engineering Thesis (1-6)
***Advisor*: Prof. Keith Gardiner** **KG03** **X85070** **KG03**

Any of these course listings can also be taken for Professional Development (non-credit) or as a site license. Please call Rosie at 610-758-6210 for price listings.

- Participation in professional continuing education <u>Business</u> courses requires registrants to possess an undergraduate degree. A copy of the undergraduate transcript must be submitted with the professional continuing education registration form.

<u>Courses may be cancelled due to low enrollments</u>
M – Monday T = Tuesday W = Wednesday R = Thursday F = Friday
E301 – Mountain Campus PL410 = Packard Lab 410 PL416 = Packard Lab 416
Cost per credit hour for Fall 09 = $645 per credit hour Lehigh phone (610) 75+extension
8/26/2009