Distance Ed Course Offerings
Spring 2018    01/22/18 - 05/04/18

Spotlight on four new courses for Spring 2018:
- ChE 395-D10 - Understanding Medical Device Regulations (3)
- ISE 465-D10 - Applied Data Mining (3)
- ME 350-D11 - Sp Topics: Orbital Mechanics (3)
- TE 407-D10 - Intellectual Property Creation and Management (2)

Tuition rates below are per credit hour.
All courses with OL and HY delivery formats are subject to $100 support fee per course.

- Arts and Science Courses: $940 per credit (plus $100 support fee if OL/HY delivery format)
- Business Courses: $1,075 per credit (plus $100 support fee if OL/HY delivery format)
- Engineering Courses: $1,460 per credit (plus $100 support fee if OL/HY delivery format)
- Healthcare Systems Engineering Program: $1,460 per credit (plus $100 support fee if OL/HY delivery format)
- Management Science and Engr. Program: $1,460 per credit (plus $100 support fee if OL/HY delivery format)


Please click on the individual course Number/Sec fields to see the full Course Descriptions including:
- Course description
- Prerequisites
- Equipment or software requirements
- Attendance requirements
- Special course dates
- Textbooks

Students should note there may be elective courses outside their program area that fit curriculum requirements. Students should review all course offerings, prerequisites and seek Program Advisor’s approval if interested.

When printing document, please adjust page range and print orientation if you only want to print the course list without all of the course descriptions.

Delivery Format Key

CL = Classroom LIVE
An integrated, web-based virtual environment that delivers programs in real time following the on-campus schedule from classrooms on Lehigh’s campus to students in their homes, at their workplace, or while traveling. These classes do require live participation and discussion and are also archived for later review.

OL = Online
An asynchronous online format that offers flexible scheduling and participation. A 3-credit online course includes approximately 36 hours of content and assignments. Each online course requires an additional $100 online fee.

HY = Hybrid
A combination of both Classroom LIVE segments and asynchronous online segments. All DE students are required to connect in real time for the Classroom LIVE sessions, dates of which will be determined by the instructor.

IS = Independent Study
Delivery requires contact with advisor to arrange a project or research.

Course Registration
Only officially admitted students are eligible to register for Lehigh University courses for academic credit.

All DE students will register online via Lehigh’s campus portal, using their alternate pin. Students must have department approval for their course selections.

Course Registration
Tuition

CL = Classroom LIVE

OL = Online

HY = Hybrid

IS = Independent Study
## Distance Ed Course Offerings
### Spring 2018

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## Distance Ed Course Offerings
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**DELIVERY METHOD KEY**
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- OL = Online
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- HY = Hybrid

**SESSION KEY**
- Full = full term session
- SS1 = session 1
- SS2 = session 2

**Distance Ed Course Offerings**

#### Spring 2018

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**(Summer Semester Only)**
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**Run Date:** 12/4/2017

**Current Version:** 12/4/17

**Spring 2018**
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## Engineering

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A weekly live session will be conducted.

A weekly live session will be conducted, day/time TBD.
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<td>OL</td>
<td>Polymer Thermodynamics</td>
<td>14215</td>
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<tr>
<td>MAT 499-D10</td>
<td>Full</td>
<td>IS</td>
<td>Dissertation - Materials Science</td>
<td>12639</td>
<td>MAT 499</td>
<td>1-15</td>
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<td>OL</td>
<td>Composite Materials</td>
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<td>ME 350-D11</td>
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<td>Sp.Topics: Orbital Mechanics</td>
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<td>ME 350</td>
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<td>ME 402-D10 OL</td>
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<td>OL</td>
<td>Advanced Manufacturing Science</td>
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<td>Heat and Mass Transfer</td>
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<td>ME 450-D10 OL</td>
<td>Full</td>
<td>OL</td>
<td>Special Topics: Behavior and Design of Blast Resistant Structures</td>
<td>13851</td>
<td>ME 450</td>
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<td>Project - Engineering</td>
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<td>Thesis - Mechanical Engineering</td>
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<td>Full</td>
<td>IS</td>
<td>Dissertation - Mechanical Engineering</td>
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<td>MSE 362-D10 OL</td>
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<td>OL</td>
<td>Logistics and Supply Chain Management</td>
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<td>MSE 362/ISE 362</td>
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Distance Ed Course Offerings
Spring 2018

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<td>MSE 402-D10</td>
<td>Full</td>
<td>CL</td>
<td>Introduction to the Organization and Its Environment</td>
<td>12841</td>
<td>MSE 402/MBA 401</td>
<td>2</td>
<td>M</td>
<td>06:00 PM - 09:30 PM</td>
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<td>MSE 403-D10</td>
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<td>IS</td>
<td>Global Competitive Environment</td>
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<td>MSE 446-D10</td>
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<td>HY</td>
<td>International Supply Chain Management</td>
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<td>MSE 446</td>
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*Live session dates for classroom presentations TBD.*

| MSE 451-D10 | Full   | IS       | Project - Manufacturing Systems Engineering            | 11895| MSE 451                  | 1-3     | -      | -                       | -     | Advisor              |
| MSE 490-D10 | Full   | IS       | Thesis - Manufacturing Systems Engineering             | 11896| MSE 490                  | 1-6     | -      | -                       | -     | Advisor              |
| TE 407-D10  | Full   | CL       | Intellectual Property Creation and Management          | 14527| TE 407                   | 2       | R      | 06:00 PM - 09:00 PM    | PA 410| Maenner              |
Research - Biology

Course Numbers: BIOS 407-D26

Prerequisites: none

Instructor - Prof. Robert Skibbens  (610) 758-6162  rvs3@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
   Need Student’s Advisor.

Equipment / Software Requirements:
   none specified

Notes:
   (May be continued on next page)

Textbooks:
Project - Engineering

Course Numbers: MAT 460-D10

Prerequisites: none

In-depth study of a problem in the area of materials engineering or design. The study is to lead to specific conclusions and be embodied in a written report.

Additional Course Requirements:
Intended for candidates for the M.Eng. May be repeated for a total of three credit hours

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:
Thesis - Manufacturing Systems Engineering

Course Numbers: MSE 490-D10

Prerequisites: none

Instructor - Advisor

Please contact your Advisor for more information.

Additional Course Requirements:
Instructor Permission

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:
Course Descriptions  Spring 2018

Composite Materials

Course Numbers: MAT 309-D10 OL

Prerequisites: MAT 33 or MAT 393, Mech 3

Equipment / Software Requirements:
Mathematica

Additional Course Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Title: Composite Materials: Science and Engineering

Author(s): Chawla, Krishan K.  Edition: 3rd
Publisher: Springer Science & Bus. Media  ISBN(s): 0387743642

Additional Info:
Link to Lehigh Bookstore

Title: Composite Materials: Science and Engineering

Author(s): Chawla, Krishan K.  Edition: 3rd
Publisher: Springer Science & Bus. Media  ISBN(s): 0387743642

Additional Info:
Link to Lehigh Bookstore
Introduction to Polymer Science

Course Numbers: CHE 392-D10 OL

Prerequisites: Should have completed one year of physical chemistry and one year of organic chemistry. Must have junior or senior level standing in CHE, CHEM, or MAT or graduate student standing.

Instructor - Eric Daniels   (610) 758-3602   esd0@lehigh.edu

Introduction to concepts of polymer science. Kinetics and mechanism of polymerization, synthesis and processing of polymers, characterization. Relationship of molecular conformation, structure and morphology to physical and mechanical properties.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Highly Recommended  Title: Introduction to Polymers

Publisher: CRC Press. Taylor and Francis Group. Boca Raton
ISBN(s): 978-0-8493-3929-5

Additional Info: Link to Lehigh Bookstore

Highly Recommended  Title: Introduction to Polymers

Publisher: CRC Press. Taylor and Francis Group. Boca Raton
ISBN(s): 978-0-8493-3929-5

Additional Info: Link to Lehigh Bookstore
Course Descriptions  Spring 2018

Chemical Engineering Fundamentals III

*Course Numbers:*  CHE 383-D10 OL

*Prerequisites:*  Undergraduate degree in a scientific or engineering discipline or one semester undergraduate level general chemistry, one semester undergraduate level physics (statistics and dynamics), and two semesters undergraduate calculus and department permission required.

Instructor - Prof. Caesar Silebi  (610) 758-4267  cas5@lehigh.edu

Fundamentals of thermodynamics, reaction kinetics and reactor analysis, and applied mathematics.

*Additional Course Requirements:*  none specified

*Equipment / Software Requirements:*  none specified

*Notes:*  
(May be continued on next page)

*Textbooks:*

**Required**  
Title: *Introduction to Chemical Thermodynamics*

Author(s): Smith, Vaness and Abbott  
Publisher: McGraw Hill  
ISBN(s): 9780073104454

Additional Info:  Link to Lehigh Bookstore

**Required**  
Title: *Chemical Reaction Engineering*

Author(s): O. Levenspiel  
Publisher: J. Wiley  
ISBN(s): 0-471-25424-X

Additional Info:  Link to Lehigh Bookstore

**Required**  
Title: *Mathematical Methods in Chemical Engineering*

Author(s): V.G. Jenson and G.V. Jeffreys  
Publisher: Academic Press  
ISBN(s): 9780195098211

Additional Info:  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

Link to Lehigh Bookstore

Original List Run Date: 12/4/2017  Current Version: 12/4/17
Polymer Nanocomposites

Course Numbers: MAT 386-D10 OL

Prerequisites: An introductory polymer course (MAT 204 or MAT 393) or consent of the department chair.

Instructor - Prof. Raymond Pearson (610) 758-3857 rp02@lehigh.edu

Synthesis, morphology and properties of polymer nanocomposites. Comparisons with traditional particulate composites will be made and models predicting properties will be emphasized. Melt viscosity, mechanical properties, barrier properties and flame retardancy will be discussed.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:
Polymer Nanocomposites

Course Numbers: MAT 486-D10 OL

Prerequisites: An introductory polymer course (MAT 204 or MAT 393) or consent of the department chair.

Instructor - Prof. Raymond Pearson (610) 758-3857 rp02@lehigh.edu

Synthesis, morphology and properties of polymer nanocomposites. Comparisons with traditional particulate composites will be made and models predicting properties will be emphasized. Melt viscosity, mechanical properties, barrier properties and flame retardancy will be discussed.

Additional Course Requirements:
You will be using an ebook through the software platform Perusall.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Thesis (MOC) - Biology and Chemistry

Course Numbers: ARTS 490-D10

Prerequisites: none
- Staff

Contact Prof. Miller (Chemistry) or Prof. Ware (Biology) for further instructions

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:
(May be continued on next page)

Textbooks:

Title: None Required

Author(s):
Edition:

Publisher:
ISBN(s):

Additional Info:
Research - Biology

Course Numbers: BIOS 407-D13

Prerequisites: none

Instructor - Prof. Michael Behe (610) 758-3474 mjb1@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
Need Student's Advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Elements of Biochemistry II

Course Numbers: CHM 372-D10 OL

Prerequisites: BIOS/CHM 371

Instructor - Prof. Mary Kathryn Iovine (610) 758-6981 mki3@lehigh.edu

Dynamic aspects of biochemistry: enzyme reactions including energetics, kinetics and mechanisms, metabolism of carbohydrates, lipids, proteins and nucleic acids, photosynthesis, electron transport mechanisms, coupled reactions, phosphorylations, and the synthesis of biological macromolecules.

Additional Course Requirements:

Equipment / Software Requirements:
none specified

Textbooks:

Title: Biochemistry-W/ CD

Required
Author(s): Voet and Voet
Publisher: Wiley
Edition: 4th
ISBN(s): 9780470570951

Title: Biochemistry - Solutions Manual

Optional
Author(s): Voet and Voet
Publisher: Wiley
Edition: 4th
ISBN(s):

Additional Info: Course does not typically use the problems from the textbook, so the solutions manual is really only if students find it helpful.

Required
Title: Biochemistry-W/ CD

Author(s): Voet and Voet
Publisher: Wiley
Edition: 4th
ISBN(s): 9780470570951
Optional

Title: Biochemistry - Solutions Manual

Author(s): Voet and Voet
Publisher: Wiley
Edition: 4th
ISBN(s): 

Additional Info: Course does not typically use the problems from the textbook, so the solutions manual is really only if students find it helpful.

Link to Lehigh Bookstore
Research - Biology

Course Numbers: BIOS 407-D17

Prerequisites: none

Instructor - Gregory Lang  (610) 758-6359  gil213@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
   Need Student’s Advisor.

Equipment / Software Requirements:
   none specified

Notes:
   (May be continued on next page)

Textbooks:
Information Technology in Healthcare

Course Numbers:  ISE 473-D10 OL

Prerequisites:  none

Instructor - Robert McDonald  (802) 233-6806  rbm216@lehigh.edu

Introduction to information systems in Healthcare. Components of the system; electronic medical records, patient monitoring and data collection (clinical information systems), ancillaries (lab, pharmacy, radiology), imaging and digital technology, financial, inventory and management information systems. Enterprise systems in Healthcare, IT driven cost, efficiency and treatment quality metrics. Data warehousing, sharing, mining, protection and privacy issues.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Required

Title: Health Care Information Systems: A Practical Approach for Health Care Management

Author(s): Wager, Lee and Glaser
Edition: 3rd Edition
Publisher:

Additional Info:
Link to Lehigh Bookstore
Course Descriptions  Spring 2018

Transport Process

Course Numbers:  CHE 415-D10 OL

Prerequisites:  CHE 452 or equivalent

Instructor - James Gilchrist  (610) 758-4781  jfg204@lehigh.edu

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.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:

(May be continued on next page)

Textbooks:

Recommended  Title:  *Analysis of Transport Phenomena*


Additional Info:
Link to Lehigh Bookstore
Sp. Topics: Orbital Mechanics

Course Numbers: ME 350-D1

Prerequisites: none

Instructor - Prof. Terry Hart (610) 758-4173 teh305@lehigh.edu

This course covers topics in both orbit and attitude dynamics and control, including Keplerian orbits and non-Keplerian motion, rendezvous mechanics, single- and multiple-impulse maneuvers and orbit transfers, and orbital stationkeeping, as well as rotational kinematics, rigid-body dynamics, passive and active attitude sensors and control. The course develops the ability to analyze both the orbital and attitude dynamics and stability of spacecraft, and to assess the performance of basic control schemes for these motions.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:

(May be continued on next page)

Textbooks:

Required

Title: Orbital Mechanics for Engineering Students

Author(s): Howard D. Curtis
Publisher: Elsevier Aerospace Engineering Series


Additional Info:
Lehigh Bookstore
Mathematical Methods in Engineering II

Course Numbers: ME 453

Prerequisites: Instructor Permission Required.

Instructor - Justin Jaworski  

jwj213@lehigh.edu


Additional Course Requirements:

Equipment / Software Requirements:
none specified

Notes:

(May be continued on next page)

Textbooks:

Required  

Title: Complex Variables: Introduction and Applications

Author(s): Mark J. Ablowitz and Athanassios S. Fokas  

Publisher: Cambridge University Press  
ISBN-10: 0521534291

Additional Info:

Link to Lehigh Bookstore
Product Quality

Course Numbers: ISE 332-D10 OL

Prerequisites: none

Instructor - Prof. Eugene Perevalov (610) 758-4031 eup2@lehigh.edu

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.

Additional Course Requirements: none specified

Equipment / Software Requirements:
Minitab

Notes:
(May be continued on next page)

Textbooks:
Title: TBA

Author(s):
Edition:
Publisher:
ISBN(s):
Additional Info:
Research - Biology

Course Numbers: BIOS 407-D14

Prerequisites: none

Instructor - Prof. Lynne Cassimeris
(610) 758-6275 lc07@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
Need Student's Advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Research - Biology

Course Numbers: BIOS 407-D25

Prerequisites: none

Instructor - Prof. Vassie Ware  (610) 758-3690  vcw0@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
Need Student's Advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Special Topics in Molecular Biology

Course Numbers: BIOS 405-D10

Prerequisites: none

Instructor - Prof. Vassie Ware (610) 758-3690 vcw0@lehigh.edu

Research, conferences, and reports on selected topics not covered in the general graduate offerings. May be taken more than once for credit.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:
Research - Chemistry

Course Numbers: CHM 421-D10

Prerequisites: none

Instructor - Prof. Rebecca Miller (610) 758-3676 rsm4@lehigh.edu

Research in one of the following fields of chemistry: analytical, inorganic, organic, physical, polymer, biochemistry.

Additional Course Requirements:
Please be sure to register for the course section affiliated with your advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Title: None Required

Author(s): Edition:
Publisher: ISBN(s):

Additional Info:
Managing Products and Services

Course Numbers: MBA 404-D10

Prerequisites: MBA 401

Instructor - Robert Trent (610) 758-4952 rjt2@lehigh.edu
Instructor - Prof. Steven Savino (610) 758-5342 sls209@lehigh.edu

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.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Required

Title: Managing Products and Services - Select Chapters from "A Framework for Marketing Management"

Author(s): Kotler & Keller; Articles and Cases
Publisher: ISBN(s): 13: 978-1-323-51699-7

Additional Info: Pearson Custom Coursepack available in bookstore

Lehigh Bookstore

Required

Title: Operations Management for MBAs

Author(s): Jack Meredith and Scott Shafer
Edition: 5th Edition

Additional Info: Order online - not available in the Lehigh Bookstore.
Managing Information

Course Numbers: MBA 403-D10

Prerequisites: MBA 401, GBUS 401 and GECO 401 or equivalents

Instructor - Prof. David Zhang  (610) 758-4225  daz215@lehigh.edu

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 deployment; 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.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:

(May be continued on next page)

Textbooks:

Required  Title: Accounting for Decision Making and Control

Author(s): Zimmerman  Edition: Custom Lehigh Bookstore Version or 8th Edition
Publisher: McGraw Hill  ISBN(s): (Lehigh) 978-1-12-1876484  (McGraw Hill) 978-0-07-802574-7

Required  Title: Business Analytics-Data Analytics and Decision Making

Author(s): Albright and Winston  Edition: Sixth Edition

Additional Info: CD not required, 4th or 5th editions are also acceptable
Logistics and Supply Chain Management

Course Numbers: ISE 362-D10 OL

Prerequisites: none

Instructor - Prof. George Wilson (610) 758-4035 grw3@lehigh.edu

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.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

**Required**

Title: Supply Chain Management: Strategy, Planning and Operation
Author(s): Chopra
Publisher: Pearson/Prentice Hall
ISBN(s): 13: 978-0133800203

Additional Info:
Link to Lehigh Bookstore

Title: Supply Chain Management: Strategy, Planning and Operation
Author(s): Chopra
Publisher: Pearson/Prentice Hall
ISBN(s): 13: 978-0133800203

Additional Info:
Link to Lehigh Bookstore
Thesis - Materials Science

Course Numbers: MAT 490-D10

Prerequisites: none

Instructor - Prof. Raymond Pearson  
(610) 758-3857  rp02@lehigh.edu

Additional Course Requirements:  
none specified

Equipment / Software Requirements:  
none specified

Notes:  
(May be continued on next page)

Textbooks:
Optimization Models and Applications

Course Numbers: ISE 426-D10 OL

Prerequisites:
Instructor - Janos Pinter (610) 758-4430 jdp416@lehigh.edu

Modeling and analysis of operations research problems using techniques from 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.

Additional Course Requirements:
Closed to students who have taken IE 316.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Suggested Title: Introduction to Mathematical Programming
Author(s): Winston and Venkataramanan Edition: V1 with CD, 4th Edition, 03
Publisher: ISBN(s): 978-0-5-3435964-5; 0-5-345964-7

Additional Info:
Link to Lehigh Bookstore
Introduction to the Organization and Its Environment

Course Numbers: MBA 401-D10

Prerequisites: none

Instructor - Prof. Andrew Ward
(610) 758-6347  anw309@lehigh.edu

An MBA core course designed to provide a thorough understanding of business organizations by examining strategies middle and senior managers use to 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 essential to their success in business.

Additional Course Requirements:
This course is taught with heavy use of case studies and in-class discussion. Real-time participation is mandatory. Distance students are required to attend at the scheduled course time. This course does not have a textbook. Instead, a course packet will be available for purchase online (approximately $45.) MSE students must take this course in conjunction with MSE 403, Global Competitive Environment (1 credit).

Equipment / Software Requirements:
Because this course requires real-time participation, online students MUST use the recommended headset/microphone, which is the Logitech Clear Chat USB headset and microphone. Several presentations are required as a part of this class. Distance students are required to have a web camera to present to the instructors and other students. Alternatively, distance students may attend class on campus on presentation days.

Notes:
(May be continued on next page)

Textbooks:
Course Descriptions  Spring 2018

Project - Engineering

Course Numbers: ME 460-D10

Prerequisites: none

Instructor - Donald Rockwell
dor0@lehigh.edu

Project work on some aspect of mechanical engineering in an area of student and faculty interest. Selection and direction of the project could involve interaction with local communities or industries. Consent of department required. Course may be repeated.

Additional Course Requirements:
Intended for candidates for the M.Eng. May be repeated for a total of three credit hours

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Title: None Required

Author(s):
Edition:
Publisher:
ISBN(s):
Additional Info:

Title: None Required

Author(s):
Edition:
Publisher:
ISBN(s):
Additional Info:
Special Topics: Behavior and Design of Blast Resistant Structures

Course Numbers: ME 450-D10 OL

Prerequisites: none

Instructor - Clay Naito (610) 758-3081 cjn3@lehigh.edu

Design and assessment of structures subject to blast demands generated from accidental or intentional detonation of high explosives. Topics include determination of blast demands, characterization of pressure distributions on structural systems and components, estimation of the response of systems to dynamic pressure demands, modeling techniques for structural components, dynamic time history analysis of systems, determination of allowable response limits and stand-off requirements for facilities, and design structures to resist the effects of close-in detonation of high explosives and the impact of ballistic fragments.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:
(May be continued on next page)

Textbooks:
Research - Biology

Course Numbers: BIOS 407-D11

Prerequisites: none

Instructor - Matthias Falk  (610) 758-5896  mmf4@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements: Need Student’s Advisor.

Equipment / Software Requirements: none specified

Notes:
(May be continued on next page)

Textbooks:
Research - Biology

Course Numbers: BIOS 407-D29

Prerequisites: none

Instructor - Prof. Mary Kathryn Iovine (610) 758-6981 mki3@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
need Student's Advisor.

Equipment / Software Requirements:
none specified

Notes:

(May be continued on next page)

Textbooks:
Thesis (MOC) - Engineering

*Course Numbers:* ENGR 490-D10

*Prerequisites:* none

Instructor - Prof. John Coulter (610) 758-6310  jc0i@lehigh.edu

Please contact your advisor.

*Additional Course Requirements:* none specified

*Equipment / Software Requirements:* none specified

*Notes:* (May be continued on next page)

*Textbooks:*

  Title: None Required

  Author(s): Edition:

  Publisher: ISBN(s):

  Additional Info:
Molecular Genetics

Course Numbers: BIOS 345-D10 OL

Prerequisites: none

Instructor - Prof. Mike Kuchka (610) 758-3687  mrk5@lehigh.edu

The organization and replication of genetic material; mutagenesis; mechanisms of regulation; mechanisms of gene transmission involving prokaryotes and eukaryotes and their viruses; techniques for intervention into genetic organization and expression.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:

(May be continued on next page)

Textbooks:

Required Title: Molecular Biology, Principles of Genome Function
Author(s): Craig et al  Edition: 2nd edition
Publisher: Oxford University Press  ISBN(s): 978-0-19-870597-0

Additional Info:
Link to Lehigh Bookstore
The MBA Integrative Experience places an emphasis on strategic management as a key tool for creating and sustaining organizational competitive advantage. By taking the point of view of the general manager, we will view the organization from an overall perspective in the context of the firm’s internal and external environment. We will examine historical perspectives, contemporary theories, and practical applications all in the spirit of helping you develop a broad understanding of strategic management issues and solutions. This course will expose you to rigorous theoretical analysis while providing you with hands-on, simulated real world business experience.

As the capstone experience in the College of Business & Economics’ MBA program, this course requires that you integrate the concepts, knowledge, and skills acquired in previous functional courses and creatively apply them toward understanding and analyzing strategic management issues.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
Because this course requires real-time participation, online students MUST use the recommended webheadset/microphone, which is the Logitech Clear Chat USB headset and microphone. Several presentations are required as a part of this class. Distance students are required to have a web camera to present to the instructors and other students. Alternatively, distance students may attend class on campus on presentation days.

Notes:
(May be continued on next page)

Textbooks:
Required Title: Strategic Management: Competitiveness and Globalization
Author(s): Hitt, Ireland, and Hoskisson
Publisher: Southwestern Publishing
ISBN(s): 978-1-285-42517-7

Additional Info:
Link to Lehigh Bookstore
Elements of Biochemistry II

Course Numbers: BIOS 372-D10 OL

Prerequisites: BIOS/CHM 371

Instructor - Prof. Mary Kathryn Iovine  (610) 758-6981  mki3@lehigh.edu

Dynamic aspects of biochemistry: enzyme reactions including energetics, kinetics and mechanisms, metabolism of carbohydrates, lipids, proteins and nucleic acids, photosynthesis, electron transport mechanisms, coupled reactions, phosphorylations, and the synthesis of biological macromolecules.

Additional Course Requirements:

Equipment / Software Requirements:
none specified

Notes:

(May be continued on next page)

Textbooks:

Required
Title: Biochemistry-W/ CD
Author(s): Voet and Voet
Publisher: Wiley
Edition: 4th
ISBN(s): 9780470570951

Optional
Title: Biochemistry - Solutions Manual
Author(s): Voet and Voet
Publisher: Wiley
Edition: 4th
ISBN(s):
Additional Info: Course does not typically use the problems from the textbook, so the solutions manual is really only if students find it helpful.

Required
Title: Biochemistry-W/ CD
Author(s): Voet and Voet
Publisher: Wiley
Edition: 4th
ISBN(s): 9780470570951
Course Descriptions  Spring 2018

Optional

Title: Biochemistry - Solutions Manual

Author(s): Voet and Voet  Edition: 4th
Publisher: Wiley  ISBN(s):

Additional Info: Course does not typically use the problems from the textbook, so the solutions manual is really only if students find it helpful.

Link to Lehigh Bookstore
Managing People

Course Numbers: MBA 405-D10

Prerequisites: MBA 401

Instructor - Douglas Mahony (610) 758-4935 dmm309@lehigh.edu

An MBA core course that focuses on how organizations create or sustain a competitive advantage through people. In this course you will learn to apply principles of organizational behavior toward effective human resource management. Topics covered in this course include organization and job fit, employee attraction and selection, motivation principles, negotiation and conflict management, organizational culture, job design, and change management. This course also offers students the opportunity to learn about their leadership strengths and weaknesses including decision making, communication, and team building. The course material will be covered using lectures, class exercises and discussion, current topics and case analyses.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Title: TBA

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:
Project - Manufacturing Systems Engineering

Course Numbers: MSE 451-D10

Prerequisites: none

Instructor - Advisor

Please contact Advisor for more information.

Additional Course Requirements:

Instructor Permission

Equipment / Software Requirements:

none specified

Notes:

(May be continued on next page)

Textbooks:

Title: None Required

Author(s): 

Edition: 

Publisher: 

ISBN(s): 

Additional Info:
Introduction to the Organization and Its Environment

Course Numbers: MSE 402-D10

Prerequisites: none

Instructor - Prof. Andrew Ward (610) 758-6347 anw309@lehigh.edu
Instructor - Shawn Hayashi skh212@lehigh.edu

An MBA core course designed to integrate financial and managerial concepts into operations decisions. Disciplines of accounting, finance and economics are combined to provide substantive foundations for discussing and analyzing data. Implications of analysis are applied to facilitate decision-making in other areas such as marketing, operations (manufacturing, logistics and engineering), human resources, information technology and general management. The major learning objectives will be applied through a series of “living” cases that are centered on analyzing historical financial performance, preparing a business plan, and valuing a business.

Additional Course Requirements:

This course is taught with heavy use of case studies and in-class discussion. Real-time participation is mandatory. Distance students are required to attend at the scheduled course time. This course does not have a textbook. Instead, a course packet will be available for purchase online (approximately $45.) MSE students must take this course in conjunction with MSE 403, Global Competitive Environment (1 credit).

Equipment / Software Requirements:

Because this course requires real-time participation, online students MUST use the recommended headset/microphone, which is the Logitech Clear Chat USB headset and microphone. Several presentations are required as a part of this class. Distance students are required to have a web camera to present to the instructors and other students. Alternatively, distance students may attend class on campus on presentation days.

Notes:

(May be continued on next page)

Textbooks:
International Supply Chain Management

Course Numbers: MSE 446-D10

Prerequisites: none

Instructor - Alan Feiertag

(610) 762-6292  adf5@lehigh.edu

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.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
Live session dates for classroom presentations TBD.

(May be continued on next page)

Textbooks:

Required
Title: Critical Chain - A Business Novel
Author(s): Eliyahu M. Goldratt
Publisher: The North River Press

Additional Info:
Link to Lehigh Bookstore
Financial Management in Healthcare

Course Numbers:  ISE 472-D10 OL

Prerequisites:  none

Instructor - Stuart Paxton  ssp212@lehigh.edu

A comprehensive introduction to and review of a wide range of relevant topics to provide a framework for understanding healthcare financial issues as well as resources for implementing appropriate operational strategies in a changing environment. The course blends the topics of accounting and finance that have become part of the everyday life of most healthcare leaders. Major topics include general accounting principles; health insurance and managed care; financial statement analysis; strategic financial planning; cost concepts and management control; capital project analysis; capital formation in for-profit and not-for-profit settings.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:

(May be continued on next page)

Textbooks:

<table>
<thead>
<tr>
<th>Required</th>
<th>Title: Essentials of Health Care Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s): William O. Cleverley, PhD; James O. Cleverly, MHA</td>
<td></td>
</tr>
<tr>
<td>Publisher: Jones &amp; Bartlett Learning</td>
<td></td>
</tr>
</tbody>
</table>

Additional Info:
Link to Lehigh Bookstore
Advanced Manufacturing Science

Course Numbers: MAT 402-D10 OL

Prerequisites: none

Instructor - Prof. John Coulter (610) 758-6310 jc0i@lehigh.edu

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. Laboratory experiences are included throughout the course.

Additional Course Requirements:

We will be using additional resources that will be made available to the students. DE students will be required to connect to some classes in real time to make student presentations. Dates to be determined by the Instructor.

Equipment / Software Requirements:

MATLAB software. Access to MATLAB is available to distance education students by using Lehigh's Virtual Public Site. Instructions on using the Virtual Public Site will be provided to registered students on the course web site.

Notes:

(May be continued on next page)

Textbooks:

Title: None Required

Author(s): 
Publisher: 
Additional Info: 

Title: None Required

Author(s): 
Publisher: 
Additional Info:
Asset Valuation

Course Numbers: ISE 413-D10 OL

Prerequisites: none

Instructor - Boris Defourny bdf213@lehigh.edu

Valuation of projects and companies by discounted cash flow models. Mechanics of present value calculations. Understanding financial statements. The determinants of equity risk, expected return, earnings, reinvestment needs and growth. Role of debt and taxation. Valuing start-up companies, distressed companies, cyclical companies, firms with exclusive rights.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:

(May be continued on next page)

Textbooks:
Research - Biology

Course Numbers: BIOS 407-D**

Prerequisites: none

Instructor - Advisor

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
Need Student’s Advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Independent Study in Materials

Course Numbers: MAT 310-D10

Prerequisites: none

Instructor - Prof. Raymond Pearson (610) 758-3857 rp02@lehigh.edu

Provides an opportunity for advanced, independent study of selected topics in materials science and engineering not covered in other formal courses.
Please contact Prof. Raymond Pearson for more information.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:

(May be continued on next page)

Textbooks:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):

Additional Info:
Composite Materials

Course Numbers: ME 309-D10 OL

Prerequisites: MAT 33 or MAT 393, Mech 3

Instructor - Prof. Raymond Pearson (610) 758-3857 rp02@lehigh.edu

Instructor - Joachim Grenestedt (610) 758-4129 jog5@lehigh.edu

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

Additional Course Requirements:
none specified

Equipment / Software Requirements:
Mathematica

Notes:
(May be continued on next page)

Textbooks:

Title: Composite Materials: Science and Engineering
Author(s): Chawla, Krishan K. Edition: 3rd
Publisher: Springer Science & Bus. Media ISBN(s): 0387743642

Additional Info:
Link to Lehigh Bookstore

Title: Composite Materials: Science and Engineering
Author(s): Chawla, Krishan K. Edition: 3rd
Publisher: Springer Science & Bus. Media ISBN(s): 0387743642

Additional Info:
Link to Lehigh Bookstore
Dissertation (MOC) - Engineering

Course Numbers: ENGR 499-D10

Prerequisites: none

Adviser - Prof. John Coulter (610) 758-6310 jc0i@lehigh.edu

Please contact your advisor.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:
(May be continued on next page)

Textbooks:
Advanced Manufacturing Science

Course Numbers: ME 402-D10 OL

Prerequisites: none

Instructor - Prof. John Coulter (610) 758-6310 jc0i@lehigh.edu

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. Laboratory experiences are included throughout the course.

Additional Course Requirements:
We will be using additional resources that will be made available to the students. DE students will be required to connect to some classes in real time to make student presentations. Dates to be determined by the Instructor.

Equipment / Software Requirements:
MATLAB software. Access to MATLAB is available to distance education students by using Lehigh's Virtual Public Site. Instructions on using the Virtual Public Site will be provided to registered students on the course web site.

Notes:

(May be continued on next page)

Textbooks:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:
Research - Biology

Course Numbers: BIOS 407-D18

Prerequisites: none

Instructor - Prof. Mike Kuchka (610) 758-3687 mrk5@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
Need Student’s Advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Techniques in Cell and Molecular Biology

Course Numbers: BIOS 427-D10

Prerequisites: none

Instructor - Prof. Vassie Ware (610) 758-3690 vcw0@lehigh.edu

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; molecular cloning techniques; oocyte microinjection techniques; tissue culture methods and autoradiography.

Additional Course Requirements:
Contact Prof. Ware for further instructions

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Title: None Required

Author(s):
Edition:
Publisher:
ISBN(s):
Additional Info:
Course Descriptions  Spring 2018

Dissertation - Mechanical Engineering

Course Numbers:  ME 499-D10

Prerequisites:  none

Instructor - Prof. Jacob Kazakia  (610) 758-3785  jyk0@lehigh.edu

Please contact Prof. Jacob Kazakia for more information.

Additional Course Requirements:  none specified

Equipment / Software Requirements:  none specified

Notes:
(May be continued on next page)

Textbooks:

Title:  None Required

Author(s):  
Edition:

Publisher:  
ISBN(s):

Additional Info:
Thesis - Mechanical Engineering

Course Numbers: ME 490-D10

Prerequisites: none

Instructor - Prof. Jacob Kazakia  
(610) 758-3785  jyk0@lehigh.edu

Please contact Prof. Jacob Kazakia for information.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Title: None Required

Author(s):  
Edition:

Publisher:  
ISBN(s):

Additional Info:
Simulation

Course Numbers: ISE 404-D10

Prerequisites: IE 121 or IE 328 or equivalent.

Instructor - Robert Storer  (610) 758-4436  rhs2@lehigh.edu

Applications of discrete and continuous simulation techniques in modeling industrial systems. Simulation using a highlevel simulation language. Design of simulation experiments. This course is a version of IE 305 for graduate students, with research projects and advanced assignments.

Additional Course Requirements:
There is an online Lab component of the course that will be conducted via Zoom software. Students will be able to participate in the lab online in real time. The lab will also be recorded for later viewing. This session is tentatively planned to occur weekly on Fridays from 10-11 am although the timing can be discussed. Distance students are encouraged to "attend" the lab session live if possible.

Equipment / Software Requirements:
This class will rely heavily on the ARENA simulation language and software. Students will have to install VPN (virtual private network) and VPS (virtual public site) software first in order to access ARENA. All required software is available to distance

Notes:
A wkly live session will be conducted.

(May be continued on next page)

Textbooks:

Recommended
Title: Simulation Modeling And Analysis
Author(s): Averill M. Law, Ph.D.
Edition: Latest Edition
Publisher: McGraw-Hill
ISBN(s):
Additional Info: If you have an earlier edition of the book, it should be fine.
Link to Lehigh Bookstore
Research - Biology

Course Numbers: BIOS 407-D28

Prerequisites: none

Instructor - Michael Layden (610) 758-3625 mjl514@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
Need Student's Advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Creating Breakthrough Innovation

Course Numbers: MSE 431-D10

Prerequisites: Graduate student status plus two years of postgraduate work experience.

Instructor - Staff

Most products and services either fail or do average business, but some are phenomenally successful. Such products and services that provide phenomenal financial returns and become market leaders can be called "Breakthrough Products and Services". The main objective of the course is to improve our understanding of the process of creating breakthrough products and services. It is accomplished by in-class discussions of cases, assignments, and the state-of-the-art research work in academia and industry. The course concludes with a term paper that integrates the concepts learned from class discussions, reference books, and research papers and applies them to a real product.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:

(May be continued on next page)

Textbooks:

Required

Title: Creating Breakthrough Products-Revealing the Secrets that Drive Global Innovation

Author(s): Jonathan Cagan and Craig M. Vogel
Publisher: Pearson Education Inc./FT Press
ISBN(s): 13: 978-0133011425

Additional Info:
Link to Lehigh Bookstore
Biotechnology II

Course Numbers: CHE 442-D10 OL

Prerequisites: none

Instructor - Prof. Jim Hsu (610) 758-4257 jth0@lehigh.edu

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. CHE 442 closed to students who have taken CHE 342.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Required
Title: Bioseparations Science and Engineering
Author(s): Harrison
Edition: 2003
Publisher: 
ISBN(s): 0195123409

Required
Title: Bioseparations Science and Engineering
Author(s): Harrison
Edition: 2003
Publisher: 
ISBN(s): 0195123409

Link to Lehigh Bookstore
Molecular Cell Biology I

Course Numbers: BIOS 421-D10

Prerequisites: BIOS 411

Instructor - Prof. Robert Skibbens (610) 758-6162 rvs3@lehigh.edu
Instructor - Prof. Lynne Cassimeris (610) 758-6275 lc07@lehigh.edu

Molecular aspects of cell structure, cell motility, intracellular transport; and biomembrane dynamics. This is a presentation and discussion course in which recent publications to current hot topics in cell biology will be selected, presented by students, and discussed. Active participation in course discussions is a must. No textbook is needed for this course as recent manuscripts published in peer-reviewed scientific journals will be selected. Manuscripts may be selected by the instructor and students.

Additional Course Requirements:
1. Students must attend ALL classes if registered.
2. Only regular status students will be enrolled, not associate status.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):

Additional Info:
Applied Data Mining

Course Numbers:  ISE 465-D10

Prerequisites:  IE/ISE 121 or IE/ISE 328

Instructor - Derya Pamukcu  dp00@lehigh.edu

Introduction to the data mining process including business problem understanding, data understanding and preparation, modeling and evaluation, and model deployment. Emphasis on hands-on data preparation and modeling using techniques from statistics, artificial intelligence, such as regression, decision trees, neural networks, and clustering. A number of application areas are explored. This course is a graduate version of IE 365 possessing some advanced assignments. Credit will not be given for both IE 365 and IE 465.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
Remote students will need to download and install SAS software from the LTS virtual software site. Students will also need to install IBM SPSS Modeler workstation professional. (Information on obtaining this application will be provided)

Notes:
A wkly live session will be conducted, day/time TBD.

(May be continued on next page)

Textbooks:
Required
Title:  Data Mining: Concepts and Techniques
Author(s):  Han, Kamber, and Pei
Edition:  3rd Edition

Additional Info:
Link to Lehigh Bookstore
Research - Biology

Course Numbers: BIOS 407-D19

Prerequisites: none

Instructor - Prof. Linda Lowe-Krentz (610) 758-5084 ljlo@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
Need Student's Advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Elements of Engineering Analysis

Course Numbers: EMA 350-D10 OL

Prerequisites: none

Instructor - Prof. Jacob Kazakia (610) 758-3785 jyk0@lehigh.edu

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.

A) Solving analytically basic differential equations
B) Utilizing mathematical modeling to study basic engineering problems
C) Working with vectors, arrays, matrices, determinants and performing mathematical operations with them.
D) Solving systems of linear algebraic equations using analytical methods as well as numerical methods via MATLAB.
E) Using MATLAB and Excel to solve and plot the results of certain simple engineering problems.
F) Writing a computer program using either C++ or MATLAB in the context of an engineering problem.
G) Using numerical methods in the following tasks: 1. solving transcendental equations 2. curve fitting data 3. differentiating and integrating functions 4. solving simple differential equations.

Additional Course Requirements:
This course is available only to students currently enrolled in the M.S. or M.Eng. In Mechanical Engineering program; other students with an undergraduate background in Mechanical Engineering or Chemical Engineering; or by permission of instructor.

Equipment / Software Requirements:
MATLAB, Excel and C++. Access to MATLAB is available to distance education students by using Lehigh's Virtual Public Site. Instructions on using the Virtual Public Site will be provided to registered students on the course web site.

Notes:
(May be continued on next page)

Textbooks:

Required
Title: Mathematical Methods in Chemical Engineering
Author(s): V.G. Jenson and G.V. Jeffreys
Edition: 2nd
Publisher: Academic Press
ISBN(s): 9780195098211
Additional Info: 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.
Course Descriptions  

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**Required**

**Title:** *The Mathematics Companion: Essential and Advanced Mathematics for Scientists and Engineers*

**Author(s):** A. C. Fischer-Cripps
**Edition:** 05

**Publisher:** TAYLOR
**ISBN(s):** 9780750310208

**Additional Info:**
Link to Lehigh Bookstore

**Required**

**Title:** *Getting Started with MATLAB 7*

**Author(s):** Rudra Pratap
**Edition:** 10

**Publisher:** OXF
**ISBN(s):** 9780199731244

**Additional Info:** Most of you may already use Matlab or instructions to access this program will be sent to you.
Link to Lehigh Bookstore

**Required**

**Title:** *Essential C++ for Engineers and Scientists*

**Author(s):** Jeri Hanly
**Edition:** 2nd 02

**Publisher:** PEARSON
**ISBN(s):** 9780201741254

**Additional Info:** Can be purchased on Lehigh’s Bookstore website; (C++ compiler will be downloaded for free.)
Link to Lehigh Bookstore
Heat and Mass Transfer

Course Numbers: ME 423-D10 OL

Prerequisites: none

Instructor - Prof. Alparslan Oztekin (610) 758-4343 alo2@lehigh.edu

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.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

- **Required**

  Title: *Fundamentals of Heat and Mass Transfer-Text*

  Author(s): Theodore L. Bergman

  Publisher: Wiley

  Edition: 7th Edition

  ISBN(s): 13: 978-0470501979

Link to Lehigh Bookstore
Applied Supply Chain Models

Course Numbers: GBUS 456-D10

Prerequisites: none

Instructor - James Davis  (917) 609-5820  jpd279@lehigh.edu

This course will present applied analytic and qualitative approaches for developing inventory and forecasting models, production planning, supplier selection, logistics and transportation optimization, and supply chain network design.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
Microsoft PowerPoint, Word and Excel; Adobe Reader.

Notes:
Students must be available for live sessions (using Zoom) on 2/7, 3/7, 4/11, and 4/25 at 7:00 pm.

(May be continued on next page)

Textbooks:
Required
Title: Supply Chain Management-Strategy, Planning and Operation
Author(s): Sunil Chopra and Peter Meindl
Publisher:
Edition: 5th Edition or later (some minor differences in later versions)

Additional Info: Option of buying this text. See Note above.
Link to Lehigh Bookstore
Dissertation - Materials Science

Course Numbers: MAT 499-D10

Prerequisites: none

Instructor - Prof. Raymond Pearson (610) 758-3857 rp02@lehigh.edu

Contact Prof. Ray Pearson for further instructions.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:

(May be continued on next page)

Textbooks:
Investments

Course Numbers: GBUS 420-D10

Prerequisites: none

Instructor - Richard Kish  rjk7@lehigh.edu

This is a graduate course in investments. The aim is to learn investing concepts, techniques, and applications that professional and individual investors employ. Many of the techniques will serve the students well regardless of their fields. In learning these techniques, it is incumbent on the students to understand when it is appropriate to apply them and how to evaluate the techniques' strengths and weaknesses. Some of the techniques students will learn include: how to evaluate risk, how to value an asset, how to calculate price sensitivities and how to measure performance.

Upon completing this course, the student should be able to:

a) Understand and calculate various risk and return measures and apply them to the financial decision making process within the financial service arena.

b) Understand the basic concepts of the various money market and capital market securities and their relationship to risk/return tradeoffs.

c) Communicate effectively and comfortably using the language of finance.

Additional Course Requirements:
Wall Street Journal
Financial calculator

Equipment / Software Requirements:
Excel

Notes:
(May be continued on next page)

Textbooks:

Required Title: Investments: Analysis and Management
Author(s): Charles Jones and Gerald Jenson  Edition: 13th Edition

Additional Info:
Link to Lehigh Bookstore
Global Competitive Environment

Course Numbers: MSE 403-D10

Prerequisites: none

Instructor - Staff

Experimental projects in selected fields of manufacturing systems engineering, approved by the instructor. Projects discuss the global competitive environment in the context of material covered in MBA401/MSE 495. MSE students must take this course in conjunction with MSE 402, Introduction to the Organization and its Environment (2 credits).

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:

(May be continued on next page)

Textbooks:
Financial Reporting for Managers and Investors

Course Numbers:  GBUS 401-D10

Prerequisites:  none

Instructor -  Staff


Additional Course Requirements:  
none specified

Equipment / Software Requirements:  
none specified

Notes:  
(May be continued on next page)

Textbooks:  
Required  
Title:  Financial Accounting 9th, Edition: 16
Author(s): LIBBY  
Edition:  9th, Edition: 16
Publisher: MCG/CREATE  
ISBN(s): 9781308821672
Additional Info:  Students to purchase "Financial Accounting 9e-Libby"; packaged with Connect bundle for Lehigh students.

Link to Lehigh Bookstore
Mechanical Behavior of Polymers

Course Numbers: MAT 482-D10 OL

Prerequisites: none

Instructor - Prof. Raymond Pearson (610) 758-3857 rp02@lehigh.edu

A treatment of the mechanical behavior of polymers. Characterization of experimentally observed viscoelastic response of polymeric solids with the aid of mechanical model analogs. Topics include time-temperature superposition experimental characterization of large deformation and fracture processes, polymer adhesion, and the effects of fillers, plasticizer, moisture and aging on mechanical behavior.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Required
Title: An Introduction to The Mechanical Properties of Solid Polymers
Author(s): Ward and Sweeney
Publisher: Wiley
Edition: 2ND 04
ISBN(s): 9780471496267

Additional Info:
Link to Lehigh Bookstore
Course Descriptions  Spring 2018

Polymer Thermodynamics

Course Numbers:  MAT 496-D10 OL

Prerequisites:  none

Instructor - Eric Daniels  (610) 758-3602  esd0@lehigh.edu

This new course will focus on the thermodynamics of polymer systems starting from the general laws of thermodynamics and then progressing to discussions of a number of topics in polymer thermodynamics which will include the thermodynamics of: polymer solutions (e.g., thermodynamics of mixing, free energy of mixing; ideal and dilute solutions; polymer/polymer blends, polymer composites and nanocomposites, polymer miscibility, polymer phase behavior and phase separation of polymer/polymer systems. In addition, statistical thermodynamics of mixing in polymer solutions, thermodynamic equations of state vs lattice theories (e.g., the Flory-Huggins theory, x parameter); liquid polymers, polymer glasses, polymer-gas interactions, equation of state of rubber elasticity using thermodynamics analysis etc. will be included in the lectures.

The analysis and prediction of various composite polymer morphologies (esp. composite latex particles) employing thermodynamics and kinetics to correlate with the observed morphologies will be discussed as well as various experimental methods to investigate polymer thermodynamics (e.g., vapor phase osmometry, GC). The important topic of the thermodynamics and kinetics of polymer crystallization will be studied and finally biopolymer thermodynamics will conclude the course.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Stochastic Models and Applications

Course Numbers: ISE 339-D10 OL

Prerequisites: IE 230 or equivalent

Instructor - Prof. George Wilson  (610) 758-4035  grw3@lehigh.edu

Introduction to stochastic process modeling and analysis techniques and applications. Generalizations of the Poisson process; renewal theory and applications to inventory theory, queuing, and reliability; Brownian motion and stationary processes.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes:

(May be continued on next page)

Textbooks:

Title: None Required

Author(s): 
Edition:
Publisher: 
ISBN(s):
Additional Info:
Understanding Medical Device Regulations

Course Numbers: CHE 395-D10 OL

Prerequisites: none

Instructor - Prof. Sam Niedbala (610) 758-6504 san204@lehigh.edu

Development of new Medical Device products and technologies almost always require the review or approval of a government body before commercialization. This is true for all developed world markets and creates a variety of hurdles for any engineer or product development team to overcome. This course will examine the principles behind the regulation of devices and products not considered new drugs using case studies to examine the ways to deal with and anticipate regulatory requirements. The content will focus on the US and EU but will include discussion of other countries approaches to new technologies and devices. The course will benefit those who are new to FDA and ISO regulations and provide a framework that will help those entering industry.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Title: Mastering and Managing the FDA Maze
Author(s): Gordon Harnack
Publisher:
Additional Info:
Link to Lehigh Bookstore

Title: Medical Product Regulatory Affairs
Author(s): John J. Tobin
Publisher:
Additional Info:
Link to Lehigh Bookstore
Title: Development of FDA-Related Medical Products Prescription Drugs, Biologics, Medical Devices

Author(s): Elaine Whitmore
Edition: 2nd Edition
Publisher:
ISBN(s):

Additional Info:
Link to Lehigh Bookstore
Managing Financial and Physical Resources

Course Numbers: MBA 402-D10

Prerequisites: MBA 401, GBUS 401 or equivalent

Instructor - Prof. Samuel Weaver  (610) 758-5282  scw0@lehigh.edu
Instructor - Neal Snow  (610) 758-3451  nes315@lehigh.edu

An MBA core course designed to integrate financial and managerial concepts into operations decisions. Disciplines of accounting, finance and economics are combined to provide substantive foundations for discussing and analyzing data. Implications of analysis are applied to facilitate decision-making in other areas such as marketing, operations (manufacturing, logistics and engineering), human resources, information technology and general management. The major learning objectives will be applied through a series of "Living" cases that are centered on analyzing historical financial performance, preparing a business plan, and valuing a business.

Additional Course Requirements:
Recommended: Wall Street Journal - Subscribe at the special student rate ($1/week).

Equipment / Software Requirements:
none specified

Notes:

(May be continued on next page)

Textbooks:

Required
Title: Understanding Financial Statements
Author(s): Lyn Fraser, Aileen Ormiston
Publisher: 

Recommended
Title: Python for Data Analysis
Author(s): Wes McKinney
Publisher: 

Additional Info:
Thesis - Biology

Course Numbers: BIOS 490-D10

Prerequisites: none

Instructor - Prof. Vassie Ware (610) 758-3690 vcw0@lehigh.edu

Contact Prof. Ware for instructions.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:
Dissertation - Chemical Engineering

Course Numbers:  CHE 499-D10

Prerequisites:  none

Instructor - Prof. Kemal Tuzla  (610) 758-4628  kt01@lehigh.edu
Instructor - Prof. Mayuresh Kothare  (610) 758-6654  mvk2@lehigh.edu

Please contact Prof. Kemal Tuzla or Prof. Mayuresh Kothare for information.

Additional Course Requirements:
  none specified

Equipment / Software Requirements:
  none specified

Notes:
(May be continued on next page)

Textbooks:

Title:  None Required

Author(s):  Edition:
Publisher:  ISBN(s):
Additional Info:
Logistics and Supply Chain Management

Course Numbers: MSE 362-D10 OL

Prerequisites: none

Instructor - Prof. George Wilson  (610) 758-4035  grw3@lehigh.edu

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.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Required
Title: Supply Chain Management: Strategy, Planning and Operation
Author(s): Chopra
Publisher: Pearson/Prentice Hall
ISBN(s): 13: 978-0133800203

Required
Title: Supply Chain Management: Strategy, Planning and Operation
Author(s): Chopra
Publisher: Pearson/Prentice Hall
ISBN(s): 13: 978-0133800203

Link to Lehigh Bookstore
Biotechnology II

Course Numbers: CHE 342-D10 OL

Prerequisites: none

Instructor - Prof. Jim Hsu (610) 758-4257 jth0@lehigh.edu

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. CHE 442 closed to students who have taken CHE 342.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Required
Title: Bioseparations Science and Engineering
Author(s): Harrison
Publisher:
ISBN(s): 0195123409

Required
Title: Bioseparations Science and Engineering
Author(s): Harrison
Publisher:
ISBN(s): 0195123409
Special Topics: Polymer Coatings

Course Numbers: MAT 492-D11 OL

Prerequisites: none

Instructor - Eric Daniels  (610) 758-3602  esd0@lehigh.edu

Special Topics- Polymer Coatings will provide a survey of the various types of polymer coatings that are employed both in the consumer as well as the industrial marketplaces. Topics in the course will include a short discussion of the methods used to synthesize the polymer binder in a coating, what components are included in a coatings formulation, and how the various components interact with one another. Lectures will also include the various methods used to apply a coating to a particular substrate, characterization methods for various types of coatings, coatings properties, and a wide ranging discussion of the various types of polymer coatings applications such as architectural paints, wood coatings, electrodeposition for automotive coatings, can coatings, paper coatings etc. When the course is complete, the student will have a wide ranging understanding of polymer coatings and their many application areas.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Required  Title: Organic Codings Science and Technology

Author(s): Leno Wicks, Jr.; Frank Jones; S. Peter Pappas; Douglas Wicks
Publisher: Wiley

Additional Info:
Pharmaceutical Regulatory Affairs VII-Chemistry Lab to Clinical Trials

Course Numbers: CHM 477-D11 OL

Prerequisites: This course is offered as part of the Regulatory Affairs Certificate and the MS online CHEM program. Any questions should be directed to the Chemistry Graduate Advisor, Dr. Rebecca Miller (rebecca.miller@lehigh.edu)

Instructor - Tara Baney (862) 246-9940 tsbaney@gmail.com

Using basic biochemistry data, preclinical data, and the key documentation outlining results, this course covers how the clinical protocol is designed and how the trial is monitored. The use of transitional biomarkers, genetic analyses, PK/PD, dose-limiting toxicities, immunogenicity, imaging, and drug-drug interactions observed in preclinical studies serve as guideposts to the design of an optimum clinical protocol. The integration of chemistry, biology, and medicine proves essential to formulation of the first-in-man clinical study. The pathway from the chemistry lab to the clinic will be detailed with a focus on early development phase trials.

Additional Course Requirements:
Permission required for non CAS students.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

Title: None Required

Author(s): Edition:
Publisher: ISBN(s):
Additional Info:
Introduction to Polymer Science

Course Numbers: MAT 392-D10 OL

Prerequisites: Should have completed one year of physical chemistry and one year of organic chemistry. Must have junior or senior level standing in CHE, CHEM, or MAT or graduate student standing.

Instructor - Eric Daniels  (610) 758-3602 esd0@lehigh.edu

Introduction to concepts of polymer science. Kinetics and mechanism of polymerization, synthesis and processing of polymers, characterization. Relationship of molecular conformation, structure and morphology to physical and mechanical properties.

Additional Course Requirements: none specified

Equipment / Software Requirements: none specified

Notes: (May be continued on next page)

Textbooks:

Highly Recommended  Title: Introduction to Polymers


Additional Info:
Link to Lehigh Bookstore

Highly Recommended  Title: Introduction to Polymers


Additional Info:
Link to Lehigh Bookstore
Research - Biology

Course Numbers: BIOS 407-D10

Prerequisites: none

Instructor - Prof. Vassie Ware  (610) 758-3690  vcw0@lehigh.edu

Laboratory investigations in one of the department’s research areas.

Additional Course Requirements:
Need Student's Advisor.

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:
Intellectual Property Creation and Management

Course Numbers:  TE 407-D10

Prerequisites:  none

Instructor - Joseph Maenner  (215) 275-5595  jmaenner@maennerlaw.com

Intellectual property issues: confidentiality, nondisclosure, agreement not to compete, founders agreements, patents, copyrights, trademarks, trade secrets both domestic and international.

Additional Course Requirements:
none specified

Equipment / Software Requirements:
none specified

Notes:
(May be continued on next page)

Textbooks:

**Required**

Title: *Intellectual Property Strategy*

Author(s): John Palfrey
Publisher: MIT Press
Additional Info: Lehigh Bookstore
Course Descriptions  Spring 2018

SpTop: Inspiring Innovations: Creating a Process That Cultivates Continuous Breakthrough Innovation Capability

Course Numbers:  GBUS 492-D14

Prerequisites:  none

Instructor - Prof. Steven Savino

(610) 758-5342  sls209@lehigh.edu

This course is designed to provide graduate-level students with a foundational understanding of the process by which new products are cultivated for commercialization. The course explores the process of facing and understanding company key issues and challenges, eliminating inadequate ideas, and unifying the entire company management team to concentrate its collective intelligence and imagination on fresh solutions that add commercial value to the enterprise. The focus of this course is on techniques for conceptualizing new product ideas and developing clear go-to-market strategies and action plans in order to achieve commercial success. Included in the course is the process by which companies identify industry trends and opportunity Hot Spots, design value propositions, craft new product/service ideas, pipeline management, test marketing, go-to-market planning, and scaling long-term. This class utilizes synectics techniques for ideation planning and marketing models for identifying opportunity gaps and prioritizing customer benefits. Learning is accomplished through class lectures, cases, journal articles, guest lecturers, role-playing, and team projects.

Additional Course Requirements:

none specified

Equipment / Software Requirements:

none specified

Notes:

(May be continued on next page)

Textbooks: