

INDUSTRIAL ENGINEERING COURSE SYLLABI

Course Name/Course Code: **Systems-Approach to Computer-Integrated Design and Manufacturing (ADSYSMA)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Dr. Willy Zalatar

Textbook and Online Resources:

- Singh, Nanua (1996). Systems Approach to Computer-Integrated Design and Manufacturing. Singapore: John Wiley & Sons, Inc.
- Aouad, Ghassan, Wu, Song, Lee, Angela, and Onyenobi, Timothy. (2012). Computer Aided Design Guide for Architecture, Engineering, and Construction. London : SPON Press.
- Amirouche, Farid. (2004). Principles of Computer-Aided Design and Manufacturing. New Jersey: Pearson Education, Inc.
- Chang, Tien-Chien, Richard A Wysk, and Hsu-Pin Wang. (2006). Computer-Aided Manufacturing (3rd ed). New Jersey: Pearson Education, Inc.
- Groover, Mikell P. (2008). Automation, Production Systems, and Computer-Integrated Manufacturing. New Jersey: Prentice Hall.
- Monk, Ellen F. and Wagner, Bret J. (2013). Concepts in Enterprise Resource Planning. Australia: Course Technology, Cengage Learning.
- Niku, Saeed B. (2011). Introduction to Robotics: Analysis, Control, Applications. Hoboken, NJ: Wiley.
- Rao, Posinasetti N. (2010). CAD/CAM: Principles and Applications. New Delhi: Tata McGraw-Hill Education Private.
- Rehg, James A. and Henry W. Kraebber. (2005). Computer-integrated manufacturing. New Jersey: Pearson/Prentice Hall.
- Stephens, Matthew P. and Meyers, Fred E. (2010). Manufacturing Facilities Design and Material Handling. Boston: Pearson Prentice Hall.
- Zeid, Ibrahim. (2005). Mastering CAD/CAM. Boston: McGraw-Hill.
- AMHSA - Representing the UK Logistics Automation and Handling Industry. (n.d.). Retrieved from <http://www.amhsa.co.uk>.
- Robotics Online. (2008). Retrieved from <http://www.robotics.org>.

Course Information:

- a. Description - The course covers topics on advanced manufacturing systems/technologies. The concepts of production automation and related systems, computer-integrated manufacturing, computer-aided design and process planning, concurrent engineering, automated material handling, robotics, automated quality assurance, just-in-time systems, group technology, and flexible manufacturing systems are discussed. The course is designed for industrial engineering majors to have a broad understanding of advanced manufacturing systems and its various implications in the practice of the IE profession.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will prepare reports that demonstrate the present and future real-world applications of the various advanced manufacturing technologies.
- b. Student outcomes
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- The Manufacturing System
- Introduction to CIM
- Computer-Aided Design
- Concurrent Engineering
- Computer-Aided Process Planning
- Computer Numerical Control
- Fundamentals of NC technology
- Computer Numerical Control
- Automated Material Handling and Storage Systems
- Robotics
- Computer-Aided Quality Assurance
- Just-In-Time Manufacturing Systems
- Manufacturing Resource Planning (MRPII)
- Group Technology and Cellular Manufacturing
- Flexible Manufacturing and Assembly Equipment
- Enterprise Integration

Course Name/Course Code: **Enterprise Application (APLIENT)**
Credits and Contact Hours: 1 unit (1-hour lecture)
Instructor: Ronaldo Polancos

Textbook and Online Resources:

Wagner, Bret; Monk, Elleen (2013), Concepts in Enterprise Resource Planning (4th Edition). Cengage Learning Asia
Summer, Mary (2013), Enterprise Resource Planning. Pearson: New International Edition
Van Weele, Arjan J. (2014), Purchasing and Supply Chain Management (6th edition). Cengage Learning Asia
Kachinske, Edward; Kachinske, Adam; Kachinske, Timothy (2012), Maximizing your sales with Microsoft Dynamics CRM 2011 (1st edition). Cengage Learning Asia
Satzinger, J. W., Jackson, R. B., Burd, Stephen D. (2014), Introduction to Systems Analysis and Design (6th edition). Cengage Learning Asia
Rosenblatt H. J. (2014), Systems Analysis and Design (10th edition). Cengage Learning Asia

Course Information:

- a. Description - This lecture-type APLIENT course is an introductory course in Enterprise Application Systems that provides an overview in the concepts, processes and functions of Order-to-Cash and Procure-to-Pay.
- b. Prerequisites/Co-requisites: IEBSDAT (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to translate business problems into information system requirements and propose an information system solution. Evaluate and design business processes, application, architecture, and interfaces using information technology
- b. Student outcomes
 - SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.
 - SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice

Brief List of Topics to be Covered:

- Introduction to ERP
- Sales Order Management
- Inventory Management
- Purchase Order Management

Course Name/Course Code: **Business Process Outsourcing (BUSSPRO)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Dr. Alma Ma. Jennifer Gutierrez

Textbook and Online Resources:

- Cleveland, B., and J. Mayben. 1999. Callcenter Management on Fast Forward. Maryland: Call Center Press.
- Fitzsimmons, J., Fitzsimmons, M., Bordoloi, S. (2014) Service Management: Operations Strategy and Information Technology, 8th Edition. Singapore. McGraw-Hill/Irwin
- Metters, R. , K. King-Metters, M. Pullman, and S. Walton. 2005. Successful Service Operations Management. 2nd ed. Ohio: Thompson-Southwestern Publishing.
- Kotlarsky, J. 2011. New Studies in Global IT and Business Service Outsourcing: 5th Global Sourcing Workshop 2011, Courchevel, France.
- Evenson, R. (2012) Customer Service Management Training 101: Quick and Easy Techniques That Get Great Results. New York: Amacom
- Cooper, W. (2011) Handbook on Data Envelopment Analysis. Boston, MA: Springer U.S.
- Macintyre, M. (2011) Service Design and Delivery. Boston, MA: Springer U.S.

Course Information:

- a. Description - This course focuses on managing a call center and its related problem such as manpower scheduling, forecasting and planning of resources. Students will analyze the call center industry of the Philippines and identify IE tools that may be used in managing the call center.
- b. Prerequisites/Co-requisites: SERVENG (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to encourage and help students to practice critical thinking in analyzing cases given and discussed in class.
 2. The student will be able to instill the value of logical and systematic thinking in analyzing the operations and identifying the problems of a service system.
 3. The student will be able recognize the complexities of the call center industry.
 4. The student will be able to familiarize with the problems encountered in the industry.
 5. The student will be able to solve the issues in the call center area using the appropriate IE tools.
 6. The student will be able to understand the complex issues of call center scheduling.
- b. Student outcomes
 - SO-H. An understanding of the effects of engineering solutions in a comprehensive text
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Introduction to Call Center Management
- Call center functions and metrics
- Forecasting call center load
- Planning Resource Requirements
- Call center staffing tradeoffs
- Scheduling call center staff
- Managing Daily Schedules and Service
- Ergonomics Issues in Call Center Management
- Call Center Technologies

Course Name/Course Code: **Systems Analysis and Design (DEANSYS)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor: Dr. Anna Bella Siriban Manalang

Textbook and Online Resources:

Fogler, H.C., Leblanc, S. E. and Rizzo, B. (2014) Strategies for Creative Problem Solving. 3rd edition. Pearson: Prentice Hall.
Blanchard, B.S. and Fabrycky, W. J (2011) Systems Engineering and Analysis, 5th Edition. Pearson: Prentice Hall International Series in Industrial & Systems Engineering.
Kepner, C. H. and Tregoe, B.B. (2013), The New Rational Manager: An Updated Edition for the New World, Princeton Research Press, Princeton, NJ.
Isaksen, S., Dorval, B., Treffinger, D. (2011), Creative Approaches to Problem Solving: A Framework for Innovation and Change, Sage, Los Angeles, CA.
Laughlin, P. (2011), Group Problem Solving, Princeton University Press, Princeton, NJ.
Fogler, H.C., and Leblanc, S. E. with Rizzo, B. (2014) Strategies for Creative Problem Solving. Web resource: <http://www.umich.edu/~scps/>

Course Information:

- a. Description - The course introduces the students to the concepts, tools, techniques, and activities of systems analysis and design such as situation appraisal, problem analysis, decision analysis, potential problem analysis and the various tools to be used in each stage. This course explores the processes utilized by successful managers for problem solving and decision making which involve developing an understanding of a situation, investigation through systematic questioning and logic, decision making among alternatives, and ensuring the success of decisions. The Rational Management methodology developed by Kepner-Tregoe, Inc. forms the foundation of the course. It is further enhanced by design for operational feasibility such as design for usability, reliability, producibility, manufacturability, disposability, affordability and life-cycle costs
- b. Prerequisites/Co-requisites: IMEPRO1(Soft Pre-requisite), IMEENVI (Soft Pre-requisite), INOPER1 (Soft Pre-requisite), ERGBIO1 (Soft Pre-requisite), HUBEHOR(Soft Pre-requisite), IEFINMT
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Define, identify, select appropriate productivity, safety, efficiency and system problems and opportunities
 2. Apply analysis techniques and plan for alternative solutions
 3. Determine and recommend appropriate solution based on a set of criteria
 4. Develop and document solutions for the problem identified
 5. Observe originality in written report

b. Student outcomes

SO-E. An ability to recognize, formulate, and solve engineering problems

SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.

SO-F. A recognition of professional, social, and ethical responsibility

Brief List of Topics to be Covered:

- Fundamental of Systems
- Kepner Tregoe (KT) Situation Appraisal
- Problem Analysis Techniques
 - KT Problem Analysis Technique
 - Affinity/ Relationship Diagram
 - Cause and Effect Analysis
 - Stream Diagnosis
 - Why-Why Diagram
 - Problem-Tree Analysis
- Systems Design
 - Defining the Decision Statement
 - Generation and Evaluation of Alternatives
 - Design Framework
 - Decision Analysis for Mutually exclusive alternatives
 - DA for Non-mutually exclusive alternatives
- Potential Problem Analysis
 - PPA Approaches
 - Detailed Design of Proposed Systems
- System Implementation and Monitoring

Course Name/Course Code: **Introduction to Discrete Event Simulation
(DISCSIM)**
Credits and Contact Hours: 1 unit (1-hour lecture)
Instructor: Dennis T. Beng Hui

Textbook and Online Resources:

Discrete Event System Simulation by J. Banks, J. Carson, B. Nelson and D. Nicol;
Prentice Hall International Series (2013)
Simulation Modeling and Analysis by A. Law and D. Kelton; McGraw-Hill, Inc. (2012)
Simulation with ARENA by W. David Kelton, Randall Sadowski, and Nancy Zupick (2014)
Modeling, design, and simulation of systems with uncertainties by Andreas Rauh,
Ekaterina Auer; Springer (2011)
Discrete Event Simulation (2015). Retrieved from
http://en.wikipedia.org/wiki/Discrete_event_simulation
Simulation. Retrieved from <http://en.wikipedia.org/wiki/Simulation>
Simulation. Retrieved from
<http://www.eg.bucknell.edu/~xmeng/Course/CS6337/Note/master/>
Simulation Examples. Retrieved from
<http://www.eg.bucknell.edu/~xmeng/Course/CS6337/Note/master/node10.html>

Course Information:

- a. Description - This course will primarily tackle the basic concepts needed in constructing a discrete-event simulation (DES) model. It will start with a general introduction to simulation. From this, the focus will then shift to discussions regarding the general principles of a discrete-event simulation model, random variate generation and verifying, validating and analyzing the outputs of DES models
- b. Prerequisites/Co-requisites: LBYEC72 (Soft Pre-requisite), DEANSYS (Soft Pre-requisite), INOPER3 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to understand the concept of randomness and variability in defining systems.
 2. The student will be able to understand how to conduct a simulation study
 3. The student will have the ability to know how to build a simulation model using the appropriate modeling approach
 4. The student will be able to identify and demonstrate application of simulation concepts in a real-world example
- b. Student outcomes
SO-H. An understanding of the effects of engineering solutions in a comprehensive context.

Brief List of Topics to be Covered:

- Introduction to Simulation
- Applications and Types of Simulation
- General Principle of Discrete Event Simulation
- Random Numbers
- Random Variate Generation
- Verification and Validation
- Output Analysis of a Single Model
- Comparison and Evaluation of Alternative Designs

Course Name/Course Code: **Engineering Economy (for non IE's) (ECONENG)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Ms. Jazmin Tangsoc

Textbook and Online Resources:

- Sullivan, W. (2014). Engineering Economy, 16th Edition. New Jersey: Prentice Hall.
Blank, L., Tarquin A. (2012). Engineering Economy, 7th Edition. New York: McGraw Hill Science/Engineering/Math.
Edmonds, T. (2013). Fundamental Financial Accounting Concepts. New York: McGraw-Hill/Irwin.
Hartman, J. (2006). Engineering Economy and the Decision-Making Process. New Jersey: Prentice Hall.
Norton, C. and Porter, G. (2013). Introduction to Financial Accounting. Australia: South-Western, Cengage Learning.
Reimers, J. (2011). Financial Accounting: A Business Process Approach. Boston: Pearson.
Sison, E. (2009). Engineering Economic Analysis, International 10th Edition. New York: Oxford University Press.
Warren, Carl S., Reeve, James M., and Duchac, Jonathan E. (2014). Financial Accounting. Australia: South-Western, Cengage Learning.

Course Information:

- a. Description - The course deals with the basic concepts and analytical techniques useful in evaluating the worth of engineering and business projects in relation to their cost. It covers the fundamentals of accounting, interest and money-time relationships, depreciation, evaluation methods of economy studies, comparison of alternatives, with and without the effects of income taxes, and replacement studies.
- b. Prerequisites/Co-requisites: DIFFCAL(Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will have the ability to journalize original, adjusting, and closing entries for typical transactions experienced by companies.
 - 2. The student will be able to use cost data in the cost-volume profit analysis to decide on how much units should be manufactured
 - 3. The student will have the ability to compute interest rates and determine cash flows for each engineering economy alternative.
 - 4. The student will have the ability to use basic methods in economy studies to solve interest and money time relationship problems.
 - 5. The student will be able to apply inflation concepts in solving money time relationship problems and engineering solution alternatives.
 - 6. The student will have the ability to determine depreciation cost using the common methods of depreciation accounting, as well as prepare depreciation schedule.

7. The student will have the ability to construct various financial statements such as income statement, and balance sheet.
 8. The student will have the ability to compute the relevant cost in different engineering economy alternatives and choose which alternative is best.
 9. The student will have the ability to use basic methods in economy studies to compare before and after-tax alternatives
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering
- SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

Brief List of Topics to be Covered:

- Introduction
- Fundamentals of Accounting
- Definition and Classification of Costs
- Cost-Volume-Profit Analysis
- Selections in the Present Economy
- Interest and Money-Time Relationships
- Depreciation
- Construction of Cash Flow Diagrams
- Basic Methods for Making Economy Studies
- Selections Among Alternatives (Before Tax Analysis)
- Effects of Income Taxes in Economy Studies (After Tax Analysis)

Course Name/Course Code: **Introduction to Economic Analysis (ECONOMY)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Eric Siy

Textbook and Online Resources:

Samuelson, P. and Nordhaus W. (Latest edition) ECONOMICS. McGraw-Hill/ Irwin
Mankiw, G. (Latest edition) Principles of Economics. Cengage Learning.
Case, K.E. and Fair, R.C. (Latest edition) Principles of Economics. Pearson/ Prentice-Hall.
Frank, R.H. and Bernanke, B.S. (Latest edition) Principles of Microeconomics. McGraw Hill/ Irwin.

Economics textbook made available online by a former CalTech Professor is available in <http://www.mcafee.cc/Introecon/IEA.pdf>

Managerial Economics introduction was made available by a NUS professor in http://www.comp.nus.edu.sg/~ipng/mecon/sg/01int_sg.pdf

An online reference for an optimization technique can be found in <http://www.authorstream.com/Presentation/brensons-1436507-intro-to-linear-programming/>. Note: needs you to log-in using a Facebook account.

Graphtest: an online solver for linear programs can be found in <http://riot.ieor.berkeley.edu/Applications/SimplexDemo/Simplex.html/>

Course Information:

- a. Description - As an introductory economics course for Industrial Engineering majors, the generally accepted topics on economics will be covered. The first part of the course covers basic microeconomic concepts such as opportunity cost, comparative advantage, supply and demand of consumer goods and consumer behavior. The second part of the course discuss producer output as an Industrial Engineering concern. Concepts like productivity and efficiency are introduced and applied to production costs and output planning for a firm. The last part introduces macroeconomics, including a model of the economy, and the standard Aggregate Demand-Aggregate Supply model. Topics on this last part include Fiscal policy, banking, and the role of the Central Bank and government in Economic planning.
- b. Prerequisites/Co-requisites: DIFFCAL (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to recognize economic concepts like supply and demand, cost-benefit analysis, opportunity costs, and individual economic decision-making.
 2. The student will be able to demonstrate a logical economic argument based on economic concepts like supply and demand of resources in society to facilitate problem solving and decision making.
- b. Student outcomes
SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

Brief List of Topics to be Covered:

- Basic economic concepts
 - Introduction
 - Nature of economics
- Micro-economics
 - Basic problems of economic organization
 - Elements of supply and demand
 - Demand, utility and consumer behavior
 - Theory of production and marginal products
 - Analysis of cost
 - Competitive supply in the competitive markets
 - Monopoly: Analysis and regulation
- Macro-economics
 - Macro-economic fundamental concepts
 - Measurement of national output and income
 - Fiscal policy and international trade
 - Aggregate supply and business cycles
 - Money and commercial banking

Course Name/Course Code: **Physical Ergonomics (ERGBIO1)**
Credits and Contact Hours: 1 unit (1-hour lecture)
Instructor: Jazmin Tangsoc

Textbook and Online Resources:

- Bridger, R.S. (2009) Introduction to Ergonomics, 3rd edition, CRC Press
Helander, M. (2006) A Guide to Human Factors and Ergonomics. Florida: CRC Taylor and Francis
Kroemer, K.H.E, Kroemer H.B. & Kroemer-Elbert, K.E. (latest edition) Ergonomics How to Design for Ease and Efficiency 2nd edition, Prentice-Hall, New Jersey.
Kumar, S. (2008) Biomechanics in Ergonomics, CRC Press
Marras, W. & Karwowski, W. (2006) The Occupational Ergonomics Handbook. Florida: CRC/Taylor and Francis.
Salvendy, G. (2006) Handbook of Human Factors and Ergonomics 3rd edition. New Jersey: John Wiley.
Karwowski, W. and Salvendy, G. (2011) Advances in Human Factors, Ergonomics, and Safety in Manufacturing and Service Industries. Florida: CRC Press.
Duffy, V. (2011) Advances in Human Factors, Ergonomics, and Safety in Healthcare. Florida: CRC Press.
Karwowski, W., Soares, M. and Stanton, N. (2011) Human Factors and Ergonomics in Consumer Product Design: Methods and Techniques, Florida: CRC Press.
McCauley-Bush, P. (2012) Ergonomics: Foundational Principles, Applications, and Technologies. Florida: CRC Press.
Bhise, V. (2012) Ergonomics in the Automotive Design Process. Florida: CRC Press.
www.ergonomics.org (about posture, motion and ergonomics)
www.sfw.org.ergonomics (list of several ergonomic websites)

Course Information:

- a. Description - This course is concerned with the study of specific human traits and characteristics that are needed for engineering design. Properties of the human body as manifested in people's interaction with the environment are explored. This course is an integration of biological science, physiological and experimental psychology, physics and engineering. The focus is on engineering design in order to ensure safety, comfort, efficiency and performance reliability as an individual interacts with tools, machine, work environment, and job design of a task assigned to him.
- b. Prerequisites/Co-requisites: QUAMET2 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to apply ergonomic principles to assess working environment that would affect the person's performance
 2. The student will be able to apply physical ergonomic principles to assess various risks in posture and lifting to solve associated musculoskeletal disorders and safety related members.

3. The student will be able to use anthropometry in the analysis and improved design of workstation / product.
 4. The student will have the ability to make a critical review on an article on physical ergonomics.
- b. Student outcomes
- SO-E. An ability to recognize, formulate, and solve engineering problems.
- SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization

Brief List of Topics to be Covered:

- Definition of Ergonomics/ Human Factors Engineering
- History of Ergonomics
- Scope and Focus of Ergonomics
- Visual Sense
- Illumination measurement and analysis
- Auditory sense
- Define Noise
- Health effects of noise
- Writing a critique
- Musculoskeletal system
- Basic Biomechanics
- Common MSD in the Workplace
- Recommended Solutions to MSD
- RULA
- REBA
- Preventing MSD's
- Strains associated with manual handling
- Lifting capability assessment
- Limits for lifting and lowering

Course Name/Course Code: **Cognitive Ergonomics (ERGCOG2)**
Credits and Contact Hours: 1 unit (lecture)
Instructor: Dr. Rosemary Seva

Textbook and Online Resources:

- Bridger, R. (2008). Introduction to ergonomics (3rd ed.). London: CRC Press.
- Douglas, I., & Liu, Z. (Eds.). (2011). Global Usability. London: Springer.
- Goldstein, E. B. (2009). Sensation and perception (8th ed.). London: Wadsworth.
- Karwowski, W., Soares, M., & Stanton, N. (Eds.). (2011). Human Factors and Ergonomics in Consumer Product Design: Methods and Techniques London: CRC Press.
- Sternberg, R. (2008). Cognitive psychology (5th ed.). London: Wadsworth.
- Wickens, C. D., & Hollands, J. G. (2000). Engineering Psychology and Human Performance (3rd ed.). New Jersey: Prentice Hall.
- Karwowski, W. and Savendy, G. (2011) Advances in Human Factors, Ergonomics, and Safety in Manufacturing and Service Industries. Florida: CRC Press.
- Duffy, V. (2011) Advances in Human Factors, Ergonomics, and Safety in Healthcare. Florida: CRC Press.
- Bhise, V. (2012) Ergonomics in the Automotive Design Process. Florida: CRC Press.
- McCauley-Bush, P. (2012) Ergonomics: Foundational Principles, Applications, and Technologies. Florida: CRC Press.
- Cognitive ergonomics: a definition. Retrieved from <http://www.haworth.com/en-us/Knowledge/Workplace-Library/Documents/Cognitive-Ergonomics-A-Definition.pdf>
- Heeger, D. (2007). Signal detection theory. Retrieved from <http://www.cns.nyu.edu/~david/handouts/sdt/sdt.html>
- Learning and memory. (2010). Retrieved from <http://nwlink.com/~donclark/hrd/learning/memory.html>
- Details of a usability study. (2011). Retrieved from <http://www.user.com/testing-details.htm>
- Usability Professionals Association. <http://www.upassoc.org/>
- Darnell, M. (2010). Bad human factors designs. Retrieved from <http://www.baddesigns.com/>

Course Information:

- a. Description - This is an introductory course in cognitive ergonomics. Lectures include topics on signal detection theory, vigilance, information processing, learning, memory, mental workload, visual and auditory displays, and usability engineering. The course also relates cognitive limitations to the design of effective products and interfaces.
- b. Prerequisites/Co-requisites: ERGBIO1 (Soft Pre-requisite), LBYIMEC
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to evaluate and design human-computer interfaces that are effective, efficient, and enhance user satisfaction.

- b. Student outcomes
SO-E. An ability to recognize, formulate, and solve engineering problems

Brief List of Topics to be Covered:

- Definition of cognitive ergonomics
- Model of Human Information Processing
- Signal detection theory
- Vigilance
- Information Theory
- Attention in Perception and Display Space
- Usability Theories
- Usability Testing
- Memory and learning
- Mental workload

Course Name/Course Code: **Human Computer Interaction (ERG1LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Jazmin Tangsoc

Textbook and Online Resources:

Designing the User Interface by Ben Shneiderman, 1998.
Handbook of Usability Testing by Rubin, 1994.
A Practical Guide to Usability Testing by Dumas and Reddish, 1999
Interaction Design Beyond Human Computer Interaction by Preece, Rogers and Sharp, 2002

Course Information:

- a. Description - This course aim to discuss and explain the interaction between humans and computer systems. It will give on overview of the most important research issues in human-computer interaction. Several design methodologies as well as specific design information will be reviewed
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to know the important issues in Human-Computer Interaction.
 2. The student will be able to design and evaluate a user-interface using the appropriate methods.
 3. The student will be able to Know how to use software (CAMTASIA) to analyze web-based interface.
- b. Student outcomes
 - SO-E. An ability to recognize, formulate, and solve engineering problems.
 - SO-G. An ability to effectively communicate orally and in writing using the English language.
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Introduction to Human-Computer Interaction
- Cognitive Issues In Interaction Design:
 - Description of applications in HCI and Interaction Design
 - Mental models
 - Individual differences
 - Cognitive analysis

- Design of Computer Systems
 - Graphical Interface design
 - Windows,
 - Direct manipulation
 - Screen layout,
 - Use of Colors and color coding
 - Navigation techniques
 - Consistency in design
 - Design of menus and command words
 - Input devices
 - Auditory interfaces
 - Design of hypermedia and multimedia
 - Intelligent interfaces design
 - Design of decision support system
- Internet and web page design
 - PDA's and hand-held telephone
- Evaluation Of HCI
 - Usability Assessment
 - Usability Engineering
 - Scenario-based design
 - Contextual Design and Contextual Enquiry
 - Ethnographic methods
 - Task analysis, Cognitive Walkthrough
 - Use of Prototypes
 - Evaluation top-down,
 - bottom-up and middle-out.
- CAMTASIA Software

Course Name/Course Code: **Interaction Design and Methods (ERG2LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Jazmin Tangsoc

Textbook and Online Resources:

- Shneiderman B., Plaisant, C., Cohen M. and Jacobs, S. (2013). Designing the User Interface: Pearson New International Edition: Strategies for Effective Human-Computer Interaction.
- Anderson, Stephen P. (2011). Seductive Interaction Design: Creating Playful, Fun, and Effective User Experiences.
- Preece, J., Rogers, Y. and Sharp, H. (2015). Interaction Design: Beyond Human-Computer Interaction, 4th edition.
- Bedny, G. Z. and Karwowski, W. (2011). Human-Computer Interaction and Operators' Performance : Optimizing Work Design with Activity Theory.
- Bennett, K. and Flach, J. (2011). Display and Interface Design: Subtle Science, Exact art

Course Information:

- a. Description - This course aim to discuss and explain the interaction between humans and computer systems. In the study of these interactions, the course will also discuss different methods on how to do evaluation study on different human factors issues.
- b. Prerequisites/Co-requisites: PRCIEN1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to prepare and present an oral report on cases and justify recommended solutions.
 2. The student will be able to determine, evaluate problems on interface designs of different technologies and recommend a proposed design.
 3. The student will be able to make a critical analysis on interaction design article.
- b. Student outcomes
 - SO-E. An ability to recognize, formulate, and solve engineering problems.
 - SO-G. An ability to effectively communicate orally and in writing using the English language.
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Introduction to Human-Computer Interaction / Methodology
- Interaction Styles
- Organizational Issues in Software Design

- Methods for Observation and Data Collection
 - Design of Surveys and Questionnaires
 - Interview Techniques
- Analytical Techniques
 - Task Analysis
- Methodologies for Rating and User Testing Task Performance Measures
 - Measurement of Affect
- Measurement of Workload and Stress

Course Name/Course Code: **Human Factors Applications in the Industry (ERG3LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Jazmin Tangsoc

Textbook and Online Resources:

Hammer and Price (2000), Occupational Safety Management and Engineering, Prentice Hall.
Jordan, P. (2000). Designing Pleasurable Products: An Introduction to the New Human Factors. London: Taylor and Francis.
Dumas, J. and Redish, J. (1999). A Practical Guide to Usability Testing. Great Britain: Intellect.

Course Information:

- a. Description - This course aim to broaden the knowledge of human factor applications in different kinds of industry. In the study of these industries, the course aims to have an appreciation of human factor principles and their use in the industry
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to know the applications of human factors principles in the industry
 2. The student will be able to apply human factor principles in any industry situations and problems.
 3. The student will be able to assess any system problem in any industry and then apply human factors solutions.
- b. Student outcomes
 - SO-E. An ability to recognize, formulate, and solve engineering problems.
 - SO-G. An ability to effectively communicate orally and in writing using the English language.
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Introduction to Human Factors and Different Applications
- Human Factors in Aviation
- Human Factors in Airline Industry
- Human Factors in Manufacturing Industry
- Theories in Manufacturing industry applications

- Human Factors and Safety
- Safety Management and Safety Liability and Legislation
- Ergonomics in product design of consumer products
- Ergonomics in software development
- Human Factor in Service industry

Course Name/Course Code: **Facilities Planning (FACPLAD)**
Credits and Contact Hours: 3 units (lecture)
Instructor: Dennis Cruz

Textbook and Online Resources:

- Tompkins, J, White, J., Bozer, Y, and Tanchoco J. (2003). Facilities Planning, 3rd Edition. USA: John Wiley & Sons, Inc.
- Tompkins, J. (2011). Facilities Planning. Hoboken: NJ. Wiley.
- Garcia-Diaz, A, and Smith, J. (2008). Facility Planning and Design. USA: Pearson Education Inc.
- Sule, D. (1994). Manufacturing Facilities: Location, Planning, and Design. Boston: PWS Pub.
- Francis, R., McGinnis, L., and White, J. (1992). Facility Layout and Location: An Analytical Approach 2nd Edition, 2nd Edition. New Jersey: Prentice Hall, Inc.
- Lamar University. Introduction to Facility Planning. Retrieved on February 1, 2013. Retrieved from http://dept.lamar.edu/industrial/Underdown/facilities_design/FD01_introduction.htm
- New Age Publishers. Material Handling Definition and Scope. Retrieved on February 1, 2013. Retrieved from <http://www.newagepublishers.com/samplechapter/001455.pdf>
- Principles of Material Handling. (2007). Retrieved on February 1, 2013. Retrieved from <http://www.citeman.com/1716-principles-of-material-handling.html>

Course Information:

- a. Description - This course deals with the study of different layout procedures and algorithms. The different layout procedures will be discussed in relation to the flow of products and services within the plant. It will also cover computer aided layout and optimization, material handling principles and design, and warehousing.
- b. Prerequisites/Co-requisites: IMEPRO2 (Soft Pre-requisite), INOPER2 (Soft Pre-requisite), ERGBIO1 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to identify and apply layout procedures and algorithms in arranging departments/workstations/ activities involve in manufacturing, warehouse or service systems.
 2. The student will be able to evaluate and design facility plan that will help organizations in maximizing its resources.
 3. The student will be able to solve storage layout problems using concepts in warehouse operations.

b. Student outcomes

SO-A - An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering.

SO-E - An ability to recognize, formulate, and solve engineering problems.

Brief List of Topics to be Covered:

- Classification of Facility Layout and Locating a Problem
- Overview of the Plant Layout Problem
- Facilities Planning
- Facilities Planning Process
- Relationship Diagram
- Flow Analysis and Procedures
- Material Handling
- Layout Procedures
- Computer – Aided Layout
- Quantitative Approaches to Facilities Planning
- Warehouse Operations
- Automated Storage and Retrieval Systems (AS/RS)

Course Name/Course Code: **Introduction to Banking Industry (FINASER)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Jazmin Tangsoc

Textbook and Online Resources:

Miranda, Gregorio S. (1995). Commercial Banking. Laguna: L & G Business House.
Workers Desk, IBON Databank and Research Center, IBON Foundation, Inc. (2003). The Philippine Banking Sector. Sta. Mesa, Manila, Philippines: IBON Books
Research Committee of Bank Administration Institute (Phil.) and Department of Finance-Banking, University of the East (1982). Commercial Banking Operations in the Philippines. Quezon City, Philippines: Katha Publishing Co., Inc.
American Institute of Banking (1956). Principles of Bank Operations. New York: American Institute of Banking.
Heffernan, S. (2005). Modern Banking. Chichester, West Sussex: John Wiley and Sons.
Heffernan, Shelagh (2001). Modern Banking in Theory and Practice. Chichester : John Wiley and Sons.

Course Information:

- a. Description - The course focuses on the operations of banking and its related problems. This course will also discuss trends and challenges in the industry.
- b. Prerequisites/Co-requisites: SERVENG (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will have the ability to prepare and present an oral report on cases and justify recommended solutions.
 2. The student will have the ability to make a critical analysis on a service management banking system article.
- b. Student outcomes
SO-D. An ability to work effectively in multi-disciplinary and multi-cultural teams.
SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization

Brief List of Topics to be Covered:

- Introduction to Banking Operations
 - Introduction to banking industry: evolution, definition of bank/banking system
 - Roles of Banks
 - Banking Structures Around the World
 - Central Banking

- Classification of Banks
- General Functions of Banks
- Bank Supply Chain (Flow of Cash and Information)
- Philippine Commercial Banking System
 - Philippine Banking System
 - Nature of Commercial Banking
 - Functions/Services in Commercial Banking
 - Bank Investment, Asset Management, Bank Marketing
- Branch Banking and Bangko Sentral ng Pilipinas (BSP)
 - Unit Banking vs. Branch Banking
 - General Steps in Branch Establishment
 - Structure and Relationship of Head Office to the Branches
 - Typical Branch Services
 - ATM operations/Electronic Banking
 - Role(s) of Bangko Sentral ng Pilipinas
- Bank Failures
 - Management of Risks in Banking
 - Definition of Bank Failures
 - Quantifying the Causes of Bank Failures
- Competitive Issues in Banking
 - Measuring Bank Output
 - Productivity Measures
 - Empirical Models of Competition in Banking
- Strategic Issues in Banking
 - Trends and challenges in banking: Philippine setting
 - Technology of banking: delivery, information management, data capture

Course Name/Course Code: **Cleaner Production (GREENPR)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Dr. (Anthony) Shun Fung Chiu

Textbook and Online Resources:

- Chiu, A.S.F. 2009. Cleaner Production Teaching Manual. URCO, DLSU.
- Johnson, A. and Gibson, A. (2014). Sustainability in Engineering Design. Waltham, MA: Academic Press/ Elsevier.
- Fiksel, J. R. (2012). Design for Environment: A Guide to Sustainable Product Development (2nd Ed.). McGraw-Hill.
- Mihelcic, J. R. and Zimmerman, J. B. (2012). Environmental Engineering: Fundamentals, Sustainability, Design (2nd Ed.). Singapore: John Wiley & Sons.
- Curran, M. A. (Ed.) (2012). Life Cycle Assessment Handbook: A Guide for Environmentally Sustainable Products (1st Ed.). Wiley-Scrivener.
- Chiu, A.S.F.; Massard, G.; Ward, J. (2009). Introduction to the special issue on Advances in Life-Cycle Approaches to Business and Resource Management in the Asia-Pacific Region, J Clean Prod (2009), v17n14, pp 1237-1240.
doi:10.1016/j.jclepro.2009.04.007
- Chiu, A.S.F. (2009). Regional Eco-Industrial Development: Views from Different Stakeholders. A Chapter in “Industrial Ecology and the Social Sciences”, edited by Frank Boons and Jennifer Howard-Grenville. Edward Elgar Publisher: Northampton, MA.
- Chiu, A.S.F (2009). Emerging role of eco-industrial development in the Asia Pacific: Towards national and regional green economics; in Low, P.S. (Ed.), *Global Change and Sustainable Development: Asia-Pacific Perspectives*; Cambridge University Press.
- Chiu, A.S.F. (2005). Training Package for NCPC on Cleaner Production / Environmental Management of Industrial Estates. Ver 3.3. UNEP / InWent. Paris, France.
- Chiu, A.S.F. (2005). Keynote Presentation: Trends in the Efforts for Urban and Industrial Symbiosis in Asia. Proceedings of the International Symposium of Kawasaki Ecotown and United Nations Environment Program. Kawasaki, Japan, January 24.
- Chiu, A.S.F. (2003) “UN Looks to IE for Cleaner Production: Philippine IIE is a partner in caring for environment.” p. 14. Frontline, Industrial Engineers. Institute of Industrial Engineers (IIE) USA.
- Guzmar, Ruth and Guzman, Roger. (2000). Environmental Education for Sustainable Development. Wisdom Advocate Publishing.
- Nemerow, N. L. and Agardy, F. (1998). Strategies of Industrial and Hazardous Wastes Management. International Thomson Publishing Company.
- United Nations Environment Programme publications: <http://www.unep.org/publications/>
SWITCH-Asia Projects: <http://www.switch-asia.eu/projects/>
Industry and Environment – Cleaner Production: Seventh International High-level Seminar on Cleaner Production (CP7) in Prague (2002):
<http://www.unep.fr/shared/publications/pdf/WEBx0054xPA-CPprague.pdf>
- Journal of Cleaner Production through library access
- Greening the Philippine Manufacturing Industry Roadmap (2015):
<http://industry.gov.ph/wp-content/uploads/2015/03/greening-the-phil-roadmap.pdf>

Course Information:

- a. Description - This course begins with an examination of the industry sector's contributions as well as impacts to its economic and ecological environments. The role of cleaner production (CP) in sustainable development is identified at operations level, factory level, and eco-system level. Cleaner production tools that are useful in the lifecycle perspective, eco-product management, sustainable consumption and production, closed-loop system, and related dimensions will be discussed in the context of the Philippines and the Asia Pacific neighbors.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to have a clear understanding of the resource efficient and cleaner production.
 2. The student will be able to have a clear understanding of the various forms of resources and pollutions, and the cleaner production technique / technologies in managing them at operations, factory, and eco-system levels.
 3. The student will be able to apply integrated, preventative and systemic cleaner production approach to an industrial sector.
- b. Student outcomes

SO- F. A recognition of professional, social, and ethical responsibility.

Brief List of Topics to be Covered:

- Introduction to Sustainable Development
- Role of Cleaner Production at Operations Level
- Role of Cleaner Production at Factory Level
- Role of Cleaner Production at Eco-System Level
- Corporate Cleaner Production
- Cleaner Production: Philippine Scenario

Course Name/Course Code: **Introduction to Health Care Management (HEALCAR)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Ms.Jazmin Tangsoc

Textbook and Online Resources:

- Bendavid, Y., & Boeck, H. (2011). Using RFID to improve hospital supply chain management for high value and consignment items. *Procedia Computer Science*, 5, 849 – 856.
- Hill, J. W., & Powell, P. (2009). The national healthcare crisis: Is eHealth a key solution? *Business Horizons*, 52, 265 – 277.
- Inmon, W. (2008). Data warehousing in the healthcare environment. Inmon Data Systems, 3-7.
- Karongo, C. (2009). Hospital Struggle With Solution to Unpaid Bills. Retrieved from Capital News: <http://www.capitalfm.co.ke/news/Kenyanews/Hospitals-struggle-with-solution-to-unpaid-bills-11908.html>
- Oracle (2011). Oracle Enterprise Healthcare Analytics includes advanced data warehousing and analytics solutions that provide detailed, holistic, and integrated views of the healthcare provider enterprise, 1-4.
- Pedroso, M. C., & Nakano, D. (2009). Knowledge and information flows in supply chains: A study on pharmaceutical companies. *International Journal of Production Economics*, 122, 376 – 384.
- Pritchard, R. D., Harrell, M. M., DiazGranados, D., & Guzman, M. J. (2008). The productivity measurement and enhancement system: a meta-analysis. *Journal of Applied Psychology*, 93(3), 540 – 567.
- Schneller, E. S. (2010). A guide to successful strategic sourcing. Arizona: H&HN Magazine.
- Sower, V., Duffy, J., & Kohers, G. (2008). Benchmarking for Hospitals, ASQ Quality Press, Milwaukee, Wisconsin.
- Spraragen, S. L. & Chan, C. (2008). Service blueprinting: When customer satisfaction numbers are not enough. Retrieved from <http://www.dmi.org/dmi/html/conference/academic08/papers/Spraragen%20and%20Chan/DMIServiceBlueprintingFullPaperSSpraragen.pdf>
- Thakur, R., Hsu, S. H. Y., & Fontenot, G. (2011). Innovation in healthcare: Issues and future needs. *Journal of Business Research*. doi:10.1016/j.jbusres.2011.02.022
- Toba, S., Tomasini, M., & Yang, Y. (2008). Supply chain management in hospital: A case study. *California Journal of Operations Management*, 6(1), 49 – 55.
- van der Geer, E., van Tuijl, H. F. J. M., & Rutte, C. G. (2009). Performance management in healthcare: Performance indicator development, task uncertainty, and types of performance indicators. *Social Science & Medicine*, 69, 1523 – 1530.
- Wians, F. (2011). Clinical Laboratory Test: Which, Why, and What Do the Result Mean? Retrieved from American Society for Clinical Pathology: <http://labmed.ascpjournals.org/content/40/2/105.full>

Course Information:

- a. Description - The course primarily focuses on managing health care system. Issues, problems and techniques related to planning of resources, service improvement,

controlling of health care costs, etc. Likewise, this course will also discuss trends and challenges in the industry

- b. Prerequisites/Co-requisites: SERVENG (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to prepare and present an oral report on cases and justify recommended solutions.
 2. The student will be able to make a critical analysis on a service management health care article.
- b. Student outcomes
 - SO-D. An ability to work effectively in multi-disciplinary and multi-cultural teams.
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization

Brief List of Topics to be Covered:

- Introduction to Health Care
- Health Care Environment
- Government Role in Health Care
- Service to the Patients
- Service System and Service Delivery Design
- Health Operations Management
- Supply Chain in Health Care

Course Name/Course Code: **Human Behavior (HUBEHOR)**
Credits and Contact Hours: 3 units (3-Hour Lecture)
Instructor: Anna Bella Siriban Manalang

Textbook and Online Resources:

Robbins, Stephen P., Organizational Behavior, 8th edition, Prentice Hall
Davis, Keith & John Newstrom, Human Behavior at Work, McGraw Hill
George, Stephen & Arnold Weimerskirch, Total Quality Management, The Portable MBA Series, John Wiley and Sons, Inc.
Personality Theories (2012) retrieved from <http://webpace.ship.edu/cgboer/perscontents.html>
Leadership Theories (2011) retrieved from http://changingminds.org/disciplines/leadership/theories/leadership_theories.htm
Belbin Teams (2011) retrieved from <http://www.belbin.com/rte.asp?id=8>
Total Quality (2011) retrieved from <http://managementhelp.org/quality/total-quality-management.htm>
Baldrige Award (2011) retrieved from <http://asq.org/learn-about-quality/malcolm-baldrige-award/overview/overview.html>

Course Information:

- a. Description - This is an introductory course in human behavior in organization. Lectures include topics on human personality, work teams, organization types, and leadership functions in organizations.
- b. Prerequisites/Co-requisites: None
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will have the ability to evaluate and make recommendations on problems and concerns of organizations in managing their operations and implementing their programs.
- b. Student outcomes
 - SO-D. An ability to work effectively in multi-disciplinary and multi-cultural teams
 - SO-F. A recognition of professional, social and ethical responsibility
 - SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Individuals in Organization
- Development and Comparison of Management Theories
- Management and Organization

- Functional Management Skills
- Leading Managerial Function
- Controlling Managerial Function
- Total Quality Management: Overview
- Major Programs of TQM

Course Name/Course Code: **Cost Accounting (IECOSAC)**
Credits and Contact Hours: 2 units (1 hour lecture, 3 hours laboratory)
Instructor: Dr. Willy Zalatar/ Ms Jazmin C. Tangsoc

Textbook and Online Resources:

- Anthony, Robert and Reece, James (2004). Accounting: Text and Cases. USA: Richard D. Irwin, Inc.
- Hornngren, Charles T. (2009) Cost Accounting: A Managerial Emphasis. USA: Prentice-Hall Inc.
- De Leon, G. and De Leon, N. (2012) Cost Accounting. Manila: GIC Enterprises.
- Lanen, W., Anderson, S., Maher, M. (2011) Fundamental of Cost Accounting. New York: McGraw-Hill/Irwin.
- Raiborn, C. and Kinney, M. (2011). Cost Accounting Principles. Australia: South-Western Cengage Learning.
- Mowen, M. and Hansen D. (2011). Introduction to Cost Accounting: South-Western Cengage Learning.
- Warren, Carl S., Reeve, James M., and Duchac, Jonathan E. (2014). Financial Accounting. Australia: South-Western, Cengage Learning.
- Managerial and Cost Accounting. Retrieved from <http://www.e-booksdirectory.com/details.php?ebook=3572>, accessed date February 17, 2014.

Course Information:

- a. Description - This course deals with the basic concepts, principles and techniques of full cost accounting and differential cost accounting with emphasis on their managerial applications. The course will also focus on how to compute costs for products and services which will serve as basis for their cost of goods sold. The course will also deal on how to control and budget expenses of products and services.
- b. Prerequisites/Co-requisites: IEMANAC (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will have the ability to compute the total cost incurred in producing a product or service (cost of production report – COPR and cost of good and manufactured and sold statement CGMS).
 - 2. The student will be able to use cost data to compute standard, variance and differential cost in the product’s life cycle. (standard costing and variance).
 - 3. The student will be able to compute total budget and actual cost to be used in the production of products or services (over-applied or under-applied of costs).
 - 4. The student will have the ability to use cost data in the cost-volume profit analysis to decide on how much units should be manufactured.
 - 5. The student will have the ability to use the cost data to analyze relevance cost in decision making of the product’s life cycle. (relevance costing)

6. The student will be able to apply cost accounting principles in choosing the lowest cost in different decision making process.(activity based costing, joint cost allocation, job order costing)
- b. Student outcomes
- SO-H. An understanding of the effects of engineering solutions in a comprehensive context.

Brief List of Topics to be Covered:

- Review of Financial Accounting
- Introduction to Cost Terms and Purposes
- Definition and Classification of Cost
- Cost-Volume-Profit Relationships
- Relevance, Pricing, and the Decision Process
- Process Costing
- Cost Allocation: Joint and By-Products
- Job-Order Costing
- Standard Costing and Analysis of Variance
- Activity-Based Costing

Course Name/Course Code: **Structured Query Language Database (IEBSDAT)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Ronaldo Polancos

Textbook and Online Resources:

Hernandez, Michael (2013). Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design 3rd Ed. Edwards Brothers Malloy
Connolly, T. M., & Begg, C. E. (2014). Database systems: a practical approach to design, implementation, and management. Pearson International.
Provost, F., & Fawcett, T. (2013). Data Science for Business: What you need to know about data mining and data-analytic thinking. O'Reilly Media, Inc
Kroenke, D., & Auer, D. (2013). Database: Processing (13th edition). Pearson International.
Morris, S., Rob, P., & Coronel, C. (2013), Database Principles: Fundamentals of Design, Implementation, and Management (10th edition). Cengage Learning Asia
Introduction to Databases. <https://class2go.stanford.edu/db/Winter2013/preview/>
Database application. http://en.wikipedia.org/wiki/Database_application
Database Design. Retrieved from http://en.wikipedia.org/wiki/Database_design

Course Information:

- a. Description - This is a course on developing and creating database applications. It builds on the student's skills on creating applications that enhance productivity. Students will be introduced to database design concepts and be challenged to test them out in applications the capitalize on them.
- b. Prerequisites/Co-requisites: LBYIET1 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to apply the basic knowledge of information science concepts in developing database applications
 - 2. The student will be able to identify and recognize system problems that can be addressed by a database application
 - 3. The student will be able to conceptualize database applications that meet business requirements
 - 4. The student will be able to develop database applications
 - 5. The student will be able to identify decisions that can be made using the database application that was developed
- b. Student outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering
 - SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.

SO-H. An understanding of the effects of engineering solutions in a comprehensive context.

Brief List of Topics to be Covered:

- Introduction to Database Applications
- Database Design Concepts (Relational Database)
- Database Design
- Querying Database
- Data Modification
- Normalization

Course Name/Course Code: **Fundamentals of Financial Management for IEs (IEFINMT)**
Credits and Contact Hours: 2 units (1-hour lecture & 3-hour laboratory)
Instructor: Bryan Gobaco

Textbook and Online Resources:

Brigham E., Houston J. F. (2013) Fundamentals of Financial Management. 13th Edition. South-Western: Thomson.
Higgins R. (2011) Analysis for Financial Management. 9th Ed. Boston: McGraw-Hill.
Black S. B., Hirt G. A. (2012) Foundations of Financial Management. 14th Ed. Boston: McGraw Hill/Irwin
McGuigan J. R., Moyer, R. C., Rao, R. P., Kretlow W. J. (2012) Contemporary Corporate Finance. 12th Ed. International Ed., Cengage Learning.
Brigham E., Houston J. F., Jun-Ming H., Kee K. Y., Banny-Ariffin A.N. (2014) Essentials of Financial Management. Cengage Learning.
Titman, S.; Keown A.J.; Martin J.D. (2011) Financial Management: Principles and Applications. 11th Ed., Prentice Hall
All About Financial Management in Business
<http://managementhelp.org/businessfinance/index.htm>
Financial Management at MIT <http://ocw.mit.edu/courses/sloan-school-of-management/15-414-financial-management-summer-2003/>

Course Information:

- a. Description - This course is involved with the discussion of financial analysis and planning, the financial environment, management of security investment portfolios, computation of cost of capital, capital structure of a firm, principles of leverage, corporate dividend policy, management of working capital and short-term financing. It will also be a channel to familiarize students with the Philippine Stock Market (PSE).
- b. Prerequisites/Co-requisites: IMEECON (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to have a clear understanding of the fundamental principles of finance and the structure of financial markets.
 - 2. The student will be able to know how to do cash flow analysis and pro-forma statements for a corporate organization.
 - 3. The student will have the ability to interpret financial statements appropriately and assess a company's financial standing by use of financial ratios.
 - 4. The student will be able to recognize that there are different sources of capital for a firm with each source having its own pros and cons and each has its cost and required return.

5. The student will be able to realize that current assets have to be well managed and in so doing can help a firm in becoming profitable.
6. The student will be able to understand that a company's assets are funded and short term financing can be a viable means of funding.
7. The student will become aware that there are a lot of financial investment instruments that can be good opportunities for building wealth if one only understands the return and risks involved as well as the mechanics of investing in it.

b. Student outcomes

SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

Brief List of Topics to be Covered:

- Introduction to Financial Management
- Financial Analysis, Forecasting, Planning and the Financial Environment
- Security Investment and Cost of Capital
- Capital Structure and Dividend Policy
- Management of Current Assets
- Short-term Financing/Financing Current Assets
- Special Topics in Financial Management (Research/Seminar)

Course Name/Course Code: **Financial Accounting for Industrial Engineering Majors (IEMANAC)**
Credits and Contact Hours: 2 units (1 hour lecture and 3 hours computational laboratory)
Instructor: Dr. Willy F. Zalatar

Textbook and Online Resources:

- Anthony, Robert N., Reece, James S., and Hertenstein, Julie H. (1995). *Accounting: Text and Cases* (9th edition). Chicago: Irwin.
- Anthony, Robert N., Hawkins, David H., and Merchant, Kenneth A. (2004). *Accounting: Text and Cases*. Boston: Irwin/McGraw-Hill.
- Edmonds, Thomas P. (2013). *Fundamental Financial Accounting Concepts*. New York: McGraw-Hill/Irwin.
- Norton, Curtis L. and Porter, Gary A. (2013). *Introduction to Financial Accounting*. Australia: South-Western, Cengage Learning.
- Reimers, Jane L. (2011). *Financial Accounting: A Business Process Approach*. Boston: Pearson.
- Scott, William Robert (2012). *Financial Accounting Theory*. Toronto: Pearson Canada.
- Warren, Carl S., Reeve, James M., and Duchac, Jonathan E. (2014). *Financial Accounting*. Australia: South-Western, Cengage Learning.
- Financial Accounting. (1999-2010). Retrieved from <http://www.quickmba.com/accounting/fin/>.

Course Information:

- a. Description - This course introduces principles and procedures in accounting necessary to construct balance sheet and income statement for single proprietorship, partnership, and corporation. It also discusses the preparation of the statement of cost of goods sold for manufacturing concern and the analysis of financial statement through ratios.
- b. Prerequisites/Co-requisites: None
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to construct various financial statements such as cost of goods manufactured and sold statement, income statement, and balance sheet.
- b. Student outcomes

SO-J: An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

Brief List of Topics to be Covered:

- Introduction to Financial Accounting
- Forms of Business Organization
- Balance Sheet Preparation
- Account Categories
- Basic Accounting Concepts
- Income Statement Construction
- Account Categories
- Basic Accounting Concepts
- Accounting Records and Systems
- Journalizing and Posting Accounting Events
- Journalizing and Posting Adjusting and Closing Entries
- Preparation of Financial Statements of a Manufacturing Concern
- Timing of Revenue Recognition
- Accounting for Bad Debts
- Depreciation
- Income Measurement for a Manufacturing Concern
- Elements of Cost
- Inventory Account Categories
- Inventory Costing Methods
- Cost of Goods Sold Determination
- Short-Term and Long-Term Investments
- Marketable Securities
- Intangible Assets
- Short-Term and Long-Term Sources of Funds
- Bonds
- Stocks
- Dividends
- Introduction to Financial Ratio Analysis

Course Name/Course Code: **Industrial Engineering Economy (IEMECON)**
Credits and Contact Hours: 3 units (3-hour Lecture)
Instructor: Richard Li

Textbook and Online Resources:

- Sullivan, W. (2014). Engineering Economy, 16th Edition. New Jersey: Prentice Hall.
Blank, L., Tarquin A. (2012). Engineering Economy, 7th Edition. New York: McGraw Hill Science/Engineering/Math.
Hartman, J. (2006). Engineering Economy and the Decision-Making Process. New Jersey: Prentice Hall.
Sison, E. (2009). Engineering Economic Analysis, International 10th Edition. New York: Oxford University Press.
Edmonds, T. (2013). Fundamental Financial Accounting Concepts. New York: McGraw-Hill/Irwin.
Norton, C. and Porter, G. (2013). Introduction to Financial Accounting. Australia: South-Western, Cengage Learning.
Reimers, J. (2011). Financial Accounting: A Business Process Approach. Boston: Pearson.

Course Information:

- a. Description - This course deals with the basic concepts and techniques of analysis useful in evaluating the worth of engineering and business projects in relation to their cost. It covers an introduction to basic accounting principles, interest and money-time relationships, depreciation and evaluation, methods of economy studies, comparison of alternatives, with and without the effects of income taxes, replacement studies, and effect of Inflation on economy studies.
- b. Prerequisites/Co-requisites: QUAMET1 (Soft Pre-requisite), IECOSAC (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to compute interest rates and determine cash flows for each engineering economy alternative.
 2. The student will have the ability to use basic methods in economy studies to solve interest and money time relationship problems.
 3. The student will be able to apply inflation concepts in solving money time relationship problems and engineering solution alternatives.
 4. The student will have the ability to compute the relevant cost in different engineering economy alternatives and choose which alternative is best.
 5. The student will be able to use basic methods in economy studies to compare before and after tax alternatives.
 6. The student will have the ability to compute and make a decision among engineering alternatives with risks and uncertainty

b. Student outcomes

SO-H. An understanding of the effects of engineering solutions in a comprehensive context

Brief List of Topics to be Covered:

- What is Engineering Economy?
- Present Economy Studies
- Interest and Money Time Relationships
- Review on Depreciation
- Applications of Money-Time Relationships
- Minimum Attractive Rate of Return (MARR)
- Basic Methods for Making Economy Studies
- Discounted Capital Recovery
- Comparing Alternatives (Before Tax Analysis)
- Evaluation of Alternatives (After Tax Analysis)
- Dealing with Inflation
- Dealing with Uncertainty in Capital Investments
- Risk Analysis in Capital Investments

Course Name/Course Code: **NETWOK PRINCIPLES (IEPRNET)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Ronaldo Polancos

Textbook and Online Resources:

Olenewa, J. (2014), Guide to Wireless Communications (3rd edition). Cengage Learning Asia
Kurose, J and Ross, W. (2013), Computer Networking: A Top-down Approach (6th edition). Pearson International
Dean, T. (2013) Network + Guide to Networks, International Edition (6th edition). Cengage Learning Asia
Boyle, R., Clements, J. (2013), Applied Networking Labs (2nd edition). Pearson International
Stallings, W. (2013), Wireless Communications & Networks. Pearson International

Course Information:

- a. Description - This PRINNET course covers the basic concepts of computer networking. It shall include the ISO-OSI reference model, networking addressing, local and wide area networking technologies. The students shall be able to experience how to configure a LAN and WAN topology.
- b. Prerequisites/Co-requisites: SYSINDE(Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will have the ability to develop and design a network infrastructure plan that will integrate critical component of the IT fabric in an enterprise - data, applications, servers, operating system, security and data centers.
- b. Student outcomes
 - SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.

Brief List of Topics to be Covered:

- Computer Networks and the Internet
- Application Layer
- Transport Layer
- Network Layer
- Link Layer

Course Name/Course Code: **Environmental Engineering for IEs (IMEENVI)**
Credits and Contact Hours: 2 units (lecture)
Instructor: (Anthony) Shun Fung Chiu

Textbook and Online Resources:

- Davis, M., & Cornwell, D. (2008). Introduction to Environmental Engineering(4thed.). Boston: McGraw Hill.
- Davis, M., & Masten, S. (2009). Principles of Environmental Engineering and Science (2nded.). Boston: McGraw Hill.
- Guzmar, R., & Guzmar, R. (2000). Environmental Education for Sustainable Development. Quezon City: Wisdom Advocates Publishing.
- Metcalf & Eddy. (2003). Wastewater Engineering – Treatment and Reuse (4thed.). Boston: McGraw Hill International Edition.
- Mihelcic, J. (1999). Fundamentals of Environmental Engineering. New York: John Wiley and Sons.
- A comprehensive list and text of International Environmental Laws is available from: Mitchell, R.B. (2012). International Environmental Agreements Database Project (Version 2012.1). Available at: <http://iea.uoregon.edu/>. Date accessed: 5 November 2012
- A comprehensive list and text of Philippine Environment Laws is available online: Chan Robles Law Library. (n.d.). Philippine Environmental Laws. Available at: <http://www.chanrobles.com/legal9.htm#.UJzrWobcN9w>. Date accessed: 5 November 2012

Course Information:

- a. Description - This course begins with a study of the basic ecological principles necessary for the understanding of environmental issues. This includes the relationships between organisms in ecosystems, their relationships with the environment, and how materials in nature are recycled in the biosphere. Included also is the study of different environmental issues pertaining to water pollution, air pollution and solid waste management. Governmental legislations related to waste management and environmental management systems are included. This course is designed for undergraduate engineering students with emphasis on problem solving related to environmental issues that engineers and scientists are called upon to solve. Through completion of the course, students will gain fundamental experiences with the skills, knowledge, and attitudes needed to solve the complex environmental problems needing solutions from today's environmental engineers.
- b. Prerequisites/Co-requisites: CHEMONE (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to have a clear understanding of the life support system and its natural cycles.
 2. The student will be able to have a clear understanding of the various forms of resources and pollutions, and the technique / technologies in managing them.

3. The student will be able to know the national laws and policies on resource management and pollution abatement.
 4. The student will be able to apply integrated, preventative and systemic management of resources and pollution prevention.
- b. Student outcomes
- SO-F. A recognition of professional, social, and ethical responsibility

Brief List of Topics to be Covered:

- Ecological Concepts
- Ecology of Life
- Biogeochemical Cycles: Interaction among Air, Land and Water
- Pollution
- Water Environment
- Air Environment
- Solid Environment
- Hazardous Wastes
- Environmental Management System

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering

Brief List of Topics to be Covered:

- Mathematics as a Tool in the Industrial Engineering Profession
- Some Common Mathematical Symbols
- Theory of Logic
- Set Theory
- Introduction to Logic
- Methods of Proof
- Techniques for Optimization
- Linear Algebra
- Solution of Non-Linear Equations
- Optimization Theory
- Review of Functions
- Basic Concepts of Optimality
- Single Variable Optimization
- Multi-Variable Unconstrained Optimization
- Multi-Variable Optimization with Equality Constraints
- Multi-Variable Optimization with Inequality Constraints

Course Name/Course Code: **Engineering Production Management (IMEPRO1)**
Credits and Contact Hours: 3 units (2-hour lecture & 3-hour laboratory)
Instructor: Lindley Bacudio

Textbook and Online Resources:

- Heizer, J., & Render, B. (2011). Principles of Operations Management (8th Ed.). New Jersey: Prentice Hall.
- Brown, S. (2013). Strategic Operations Management. Abingdon, Oxon: Routledge, Taylor & Francis.
- Meredith, J. R. (2013). Operations Management. Singapore: John Wiley & Sons.
- Schroeder, R. G. (2013). Operations Management: Contemporary Concepts and Cases. Singapore: McGraw-Hill Education.
- Stevenson, W.J. (2012). Production/ Operations Management. New York: Irwin/McGraw-Hill.
- Johnston, R. (2012). Service Operations Management: Improving Service Delivery. Harlow, England: Pearson Education.

Course Information:

- a. Description - This is an introductory course on production management, its concepts, activities, tools and techniques. The course covers demand forecasting, process and capacity planning, aggregate planning, supply chain management, inventory management, material requirements planning, learning curves, scheduling, and maintenance. Other topics, such as product design, location and layout planning, work design and measurement, etc. are covered in higher course of the production management series.
- b. Prerequisites/Co-requisites: INDUPRO (Soft Pre-requisite), QUAMET2 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to analyze and describe key activities in a given situation or condition in operations management.
 2. The student will have the ability to design and determine best productive and reliable process strategy or methods of solution by applying appropriate concepts, tools and techniques.
- b. Student outcomes
 - SO-E. An ability to recognize, formulate, and solve engineering problems.
 - SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.
 - SO-K. An ability to perform services in the form of analysis, design, preparation of plans, specifications, estimates, and implementation of: work standards, SPC, production planning and material control systems, manufacturing and service

facilities, operations research models for production and operations, and information systems.

Brief List of Topics to be Covered:

- Introduction to Production/ Operations Management
- Forecasting
- Process Strategy, Capacity Planning and Line Balancing
- Supply Chain Management (Overview)
- Inventory Management
- Aggregate Planning
- Material Requirements Planning (MRP)
- Just-in-time (JIT) and Lean Production Systems (An Overview)
- Learning Curves
- Scheduling (An Overview)
- Maintenance and Reliability

Course Name/Course Code: **Methods and Work Study (IMEPRO2)**
Credits and Contact Hours: 4 units (4-hour lecture)
Instructor: Giselle Joy C. Esmeria

Textbook and Online Resources:

- Atienza, R.V. (2011). Work Measurement (with focus on Time Study). Manila: Polystar Printing Press for National Wages and Productivity Commission
- Niebel B. and. Freivalds, A.. (2009)Niebel’s Methods, Standards and Work Design (12th edition). Boston: McGraw Hill.
- Atienza, R.V. (2012).Transformative Organization Management Manila: Rex Publishing
- Besterfield, Dale H. (2013). Quality Improvement. New Jersey: Pearson.
- Shaffie, Sheila and Shahbazi, Shahbaz. (2012). Lean Six Sigma. New York: McGraw-Hill.
- Taylor, F. (1911). Retrieved from <http://www.wissensnavigator.com/documents/TaylorScientificManagement.pdf>
- Niebel B. and. Freivalds, A.. (2009)Niebel’s Methods, Standards and Work Design (11th edition) retrieved from <http://highered.mheducation.com/sites/0072468246/index.html> on September 12, 2014
- Freivalds, A.(2012) IE 327: Introduction to Work Design Course Syllabus retrieved from <http://www2.ie.psu.edu/Freivalds/courses/ie327new/> on September 12, 2014.

Course Information:

- a. Description – This course is the core of the Industrial Engineering discipline. It discusses the concepts, techniques, and methodologies of work design and work measurement, and how they are applied in productivity enhancements.
- b. Prerequisites/Co-requisites: IMEPRO1 (Hard Pre-requisite), ERGBIO1 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to identify and recognize problems in work methods.
 2. The student will be able to conduct work measurement to set standard times through stopwatch study, work sampling, group timing, and predetermined times, among others.
 3. The student will be able to determine appropriate allowances (for delays, fatigue, and other external factors) required in determining standard times.
 4. The student will be able to determine appropriate rating factors for persons and machines to normalize observed times.
 5. The student will be able to use statistics and mathematics to determine appropriate man-machine complement, number of observations in work measurement, and layout.

6. The student will be able to use charting tools to facilitate work improvement and measurement.
7. The student will be able to use product analysis, material analysis, and process analysis to improve work.
8. The student will be able to apply the results of work improvement to set fair, economical, and sustainable person-equipment ratio.
9. The student will be able to apply the results of work measurement in setting person-equipment complement, wages, & incentives.

b. Student outcomes

SO-E. An ability to recognize, formulate, and solve engineering problems.

SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

SO-K. An ability to perform services in the form of analysis, design, preparation of plans, specifications, estimates, and implementation of: work standards, SPC, production planning and material control systems, manufacturing and service facilities, operations research models for production and operations, and information systems.

Brief List of Topics to be Covered:

- Introduction to Methods Engineering
- Work Improvement Overview
- Process Charting and Analysis
- Introduction to Process Charting
- Operation Charting and Analysis
- Work Measurement Overview
- Time Study
- Work Sampling
- Group Timing Technique
- Predetermined Times (Overview)
- Wages and Wage Incentives
- Workforce Management/Job Design/Job Evaluation
- Plant Visit

Course Name/Course Code: **Statistical Quality Control for IE Majors
(IMEPRO3)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Dr. Willy F. Zalatar

Textbook and Online Resources:

- Montgomery, Douglas (2009). Introduction to Statistical Quality Control 6th edition. Singapore: John Wiley & Sons, Inc.
- Barone, Stefano and Franco, Eva L. (2012). Statistical and Managerial Techniques for Six Sigma Methodology: Theory and Application. West Sussex, Wiley.
- Bass, Issa and Barbara Lawton (2009). Lean Six Sigma using SigmaXL and Minitab. New York: McGraw-Hill.
- Besterfield, Dale H. (2009). Quality Control. New Jersey: Pearson Education International.
- Besterfield, Dale H. (2013). Quality Improvement. New Jersey: Pearson.
- Evans, James and Lindsay, William (2011). The Management and Control of Quality 8th edition. Canada: South-Western, Cengage Learning.
- Evans, James R. and Lindsay, William M. (2014). Managing for Quality and Performance Excellence. Ohio: South-Western, Cengage Learning.
- Gygi, Craig and Williams, Bruce. (2012). Six Sigma for Dummies. New Jersey: John Wiley & Sons.
- Hoyle, David (2009). Improvement. Oxford: Butterworth-Heinemann.
- Mitra, Amitava (2008). Fundamentals of Quality Control & Improvement. New Jersey: Wiley.
- Montgomery, Douglas C., Jennings, Cheryl L., and Pfund, Michele E. (2011). Managing, Controlling, and Improving Quality. New Jersey: Wiley.
- Schonberger, Richard (2008). Best Practices in Lean Six Sigma Process Improvement: A Deeper Look. New Jersey: Wiley.
- Shaffie, Sheila and Shahbazi, Shahbaz. (2012). Lean Six Sigma. New York: McGraw-Hill.
- Control Chart. (n.d.). Retrieved from <http://asq.org/learn-about-quality/data-collection-analysis-tools/overview/control-chart.html>.
- What is Acceptance Sampling? (n.d.). Retrieved from <http://www.itl.nist.gov/div898/handbook/pmc/section2/pmc21.htm>.
- Winton, Don (1999.) Process Capability Studies. Retrieved from <http://profsite.um.ac.ir/~ahad/CPK.pdf>.

Course Information:

- a. Description – This course covers the basic principles, concepts, and philosophy of total quality management, statistical process control, process capability, acceptance sampling, reliability theory and maintenance management, ISO 9000, and Six-Sigma, as applied to both manufacturing and service companies.
- b. Prerequisites/Co-requisites: IMEPRO2 (Soft Pre-requisite), QUAMET2 (Hard Pre-requisite), LBYIMEA (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

a. Specific outcomes

1. The student will be able to identify the appropriate variables and attributes control chart for a given quality inspection situation.
2. The student will have the ability to construct the appropriate variables and attributes control chart for a given quality inspection situation.
3. The student will be able to demonstrate competence in identifying and constructing the appropriate variables and control charts for a given quality inspection situation.

b. Student outcomes

SO-J: An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

SO-K: An ability to perform services in the form of analysis, design, preparation of plans, specifications, estimates, and implementation of: work standards, SPC, production planning and material control systems, manufacturing and service facilities, operations research models for production and operations, and information systems.

Brief List of Topics to be Covered:

- Introduction
- Total Quality Management (TQM) Concepts
- Statistical Process Control
- Control Chart for Attributes
- Time-Weighted Control Charts
- Process Capability Analysis
- Acceptance Sampling
- Reliability Theory and Maintenance Management
- Introduction to ISO 9000 Standard
- Introduction to Six-Sigma
- Organizing a Six-Sigma Program

Course Name/Course Code: **Introduction to Marketing for IEs (INDUSMA)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Eric Siy

Textbook and Online Resources:

- Kotler, P. (2010). .Marketing Management: Asian Perspective.(4th).
(www.prenhall.com/kotler)
- Del Val, E (2006) Marketing Management in the Philippine Setting. Quezon City:
University of the Philippines Press
- Gutierrez,P., ed. (2002) Cases on Marketing Mngement in the Philippine
Setting. Quezon City: University of the Philippines Press Press .
- McDaniel, C (2013) Marketing Research. Singapore: Wiley.
- Armstrong, G. and Kotler P. (2013) Marketing: An Introduction. Boston: Pearson.
- Alon, I., Jaffe, E. and Vianelli, D. (2013) Global Marketing: Contemporary Theory,
Practice and Cases. New York: McGraw-Hill/Irwin.
- Grewal, D. and Levy, M. (2012) Marketing. New York: McGraw-Hill/Irwin.

Course Information:

- a. Description - This course presents the major concepts and philosophies underlying one of the major business functions, which is marketing. It emphasizes the role of marketing as a link between society's needs and the industrial firm's production and financial efforts. The course will focus on Philippine experiences, situations and examples in contrast with other more successful and industrialized countries.
- b. Prerequisites/Co-requisites: ECONOMY (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to recognize the fundamental principles of marketing and the structure of markets.
 2. The student will have the ability to create a marketing plan for a product, that includes an analysis of a product and its marketing environment (customers, competitors, supply chain participants, etc.)
 3. The student will be able to work in a group effectively to create a marketing plan.
- b. Student outcomes
 - SO-J. An ability to use the techniques, skills, and tools necessary for engineering and business practice.
 - SO-L. Knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects in a multidisciplinary environment

Brief List of Topics to be Covered:

- Understanding Marketing Management
- Defining Marketing for the Twenty-First Century
- Adapting Marketing to the New Economy
- Building Customer Satisfaction, Value, and Retention
- Market Analysis, Forecasting, and Planning
- Winning Markets Through Market-Oriented Strategic Planning
- Gathering Information and Measuring Market Demand
- Scanning the Marketing Environment; Analyzing Consumer Markets and Buyer Behavior
- Analyzing Business Markets and Business Buying Behavior
- Dealing with the Competition
- Identifying Market Segments and Selecting Target Markets
- Developing Market Strategies
- Positioning and Differentiating the Market Offering
- Developing New Market Offerings
- Shaping the Market Offering
- Setting the Product and Branding Strategy
- Designing and Managing Services
- Developing Price Strategies and Programs
- Managing and Delivering Marketing Programs
- Designing and Managing Value Networks and Marketing Channels
- Managing Retailing, Wholesaling, and Market Logistics
- Managing Integrated Marketing Communication; Managing Advertising, Promotion, Public Relations, and Direct Marketing; Managing the Sales Force

Course Name/Course Code: **Operations Research I (INOPER1)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Richard Li

Textbook and Online Resources:

- Winston, W., Goldberg, J. (2004). Operations Research: Applications and Algorithms 4th Edition. USA: Thomson Brooks/Cole
- Hillier, F., Lieberman, G. (2010). Introduction to Operations Research, 9th Edition. Singapore: McGraw-Hill Education.
- Albright, S.(2012). Management Science Modeling. Australia: South-Western/Cengage Learning
- Daellenbach, H. (2012). Management Science: Decision Making Through Systems Thinking. New York: Palgrave Macmillan
- Hillier, F. (2011). Introduction to Management Science: A Modeling and Case Studies Approach With Spreadsheets. Boston: McGraw-Hill
- Denardo, E. (2011). Linear Programming and Generalizations: A Problem-Based Introduction With Spreadsheets. Boston, MA: Springer U.S.
- Heinz, S. (2011). Mathematical Modeling. Berlin, Heidelberg: Springer
- Taha, H. (2007). Operations Research: An Introduction, 8th Edition. New Jersey: Prentice Hall.
- Ravindran, A. (2009). Operations Research Applications. Florida: CRC Press/Taylor & Francis Group.
- INFORMS:<https://www.informs.org/Apply-Operations-Research-and-Analytics/Resources-for-O.R.-Professionals>
- GeorgiaTech-Library: <http://libguides.gatech.edu/content.php?pid=103454&sid=777835>
- Operations Research: The Science of the Better: <http://www.scienceofbetter.org/>

Course Information:

- a. Description - This course deals with the fundamental concepts of Linear Programming. These concepts include linear programming model formulation, duality theory and sensitivity analysis.
- b. Prerequisites/Co-requisites: IMEMATH (Hard Pre-requisite), QUAMET1 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to apply the basic knowledge of mathematical theories and concepts needed in formulating linear programming (LP) models.
 2. The student will be able to apply the basic knowledge of mathematical theories and concepts needed in solving engineering problems such as maintenance, logistics blending problems, etc. using LP models.
 3. The student will be able to apply basic knowledge of mathematical theories and concepts in modelling various system problems as a linear program.

4. The student will be able to apply basic knowledge of mathematical theories and concepts in Identifying relationships among variables in modelling the appropriate system objectives and constraints.
5. The student will be able to apply basic knowledge of mathematical theories and concepts in performing sensitivity analysis.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering.

Brief List of Topics to be Covered:

- Introduction to Operations Research
- History of Operations Research
- Applications of Operations Research
- Formulation of Linear Programming (LP)
- Models
- Product Mix Problem
- Feed Mix Problem
- Production Scheduling Problem
- Investment Portfolio Problem
- Blending Problem
- Trim Loss Problem
- Other Linear Programming (LP) Models or Non-Linear Mathematical Models that can be converted to LP Models
- Solution of Linear Programming Models
- Dual Model Formulation
- Interpretation of the Dual Model
- Duality Theorems
- Primal-Dual Relationship
- Dual Simplex Method
- Applications of Duality Theory
- Sensitivity Analysis
- Shadow Prices
- Resource Ranging
- Objective Function Coefficient ranging

Course Name/Course Code: **Operations Research II (INOPER2)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Mr.Dennis Cruz / Mr.Everett Ubiadas

Textbook and Online Resources:

- Winston, W., Goldberg, J. (2004). Operations Research: Applications and Algorithms 4th Edition. USA: Thomson Brooks/Cole
- Hillier, F. (2005). Introduction to Operations Research, 8th Edition. Boston: McGraw-Hill Higher Education.
- Hillier, F., Lieberman, G. (2005). Introduction to Operations Research and Revised CD-ROM 8, 8th Edition. New York: McGraw Hill Science/Engineering/Math.
- Taha, H. (2007). Operations Research: An Introduction, 8th Edition. New Jersey: Prentice Hall.
- Ravindran, A. (2009). Operations Research Applications. Florida: CRC Press/Taylor & Francis Group.
- Hillier, F. (2011). Introduction to Management Science: A Modeling and Case Studies Approach With Spreadsheets. Boston: McGraw-Hill
- Denardo, E. (2011). Linear Programming and Generalizations: A Problem-Based Introduction With Spreadsheets. Boston, MA: Springer U.S.
- Heinz, S. (2011). Mathematical Modeling. Berlin, Heidelberg: Springer
- Taha, H. (2007). Operations Research: An Introduction, 8th Edition. New Jersey: Prentice Hall.
- Ravindran, A. (2009). Operations Research Applications. Florida: CRC Press/Taylor & Francis Group.
- INFORMS:<https://www.informs.org/Apply-Operations-Research-and-Analytics/Resources-for-O.R.-Professionals>
- GeorgiaTech-Library: <http://libguides.gatech.edu/content.php?pid=103454&sid=777835>
- Operations Research: The Science of the Better: <http://www.scienceofbetter.org/>

Course Information:

- a. Description - This course covers the following topics: integer linear programming, special linear programming models (transportation, transshipment, and assignment problems), networking, dynamic programming and goal programming.
- b. Prerequisites/Co-requisites: INOPER1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to apply the basic knowledge of mathematical theories and concepts needed in formulating integer, goal and special linear programming models.

2. The student will be able to apply the basic knowledge of mathematical theories and concepts needed in solving goal, integer and special linear programming problems.
3. The student will have the ability to formulate and solve problems using the dynamic programming approach.
4. The student will be able to identify and recognize system problems that can be modelled using the different techniques presented in this course.
5. The student will be able to formulate models on various areas of application.
6. The student will be able to identify relationship among variables in modelling the appropriate system objectives and constraints.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering.

Brief List of Topics to be Covered:

- Integer Linear Programming
- Formulation of ILP Models
- Solution Techniques
- Special Types of LP Models
- Transportation Models
- Transshipment Models (Reading Assignment)
- Assignment Models
- Network Models
- Concepts and Definitions
- Spanning Tree Algorithm
- Minimal and Maximal Spanning Trees
- Shortest Route Algorithms
- Maximal Flow Algorithm
- Project Management
- Dynamic Programming (DP)
- Components of DP Model
- Formulation of DP Models
- Multicriteria Decision Making (MCDM)
- Introductory Concepts
- Goal Programming

Course Name/Course Code: **Operations Research 3 (INOPER3)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Dr. Charlle Sy

Textbook and Online Resources:

Hillier, F., Lieberman, G. (2010). Introduction to Operations Research, 9th Edition. Singapore: McGraw-Hill Education.
Albright, S.(2012). Management Science Modeling. Australia: South-Western/Cengage Learning
Daellenbach, H. (2012). Management Science: Decision Making Through Systems Thinking. New York: Palgrave Macmillan
Hillier, F. (2011). Introduction to Management Science: A Modeling and Case Studies Approach With Spreadsheets. Boston: McGraw-Hill
Denardo, E. (2011). Linear Programming and Generalizations: A Problem-Based Introduction With Spreadsheets. Boston, MA: Springer U.S.
Heinz, S. (2011). Mathematical Modeling. Berlin, Heidelberg: Springer
Michael Trick's Operations Research Blog at <http://mat.gsia.cmu.edu/blog/>
Operations Research Society of the Philippines at <http://orsp.org.ph>

Course Information:

- a. Description - This course introduces the fundamental concepts of decision theory, game theory, queueing theory, Markov processes, stochastic inventory control, and Monte Carlo simulation. The course makes use of real world examples in order to demonstrate the applicability of these concepts. The general theme of all of these topics is focusing on capturing uncertainty and risks that affects all decisions in the real world.
- b. Prerequisites/Co-requisites: INOPER2 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to understand the concepts of Risk and Uncertainty in the context of decision-making.
 - 2. The student will be able to understand the conditions in which the concepts can be applied to.
 - 3. The student will be able to identify and demonstrate applications of the appropriate concepts in a real world example.
- b. Student outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering.

Brief List of Topics to be Covered:

- Decision Theory (DT)
- Game Theory
- Markov Theory
- Queueing Theory
- Leibniz Rule
- Monte Carlo Simulation

Course Name/Course Code: **Laboratory for Systems Analysis and Design (LBYIEED)**
Credits and Contact Hours: 1 unit (3 hours laboratory)
Instructor: Dr. Anna Bella Siriban Manalang

Textbook and Online Resources:

Fogler, H.C., Leblanc, S. E. and Rizzo, B. (2014) Strategies for Creative Problem Solving. 3rd edition. Pearson: Prentice Hall.

Blanchard, B.S. and Fabrycky, W. J (2011) Systems Engineering and Analysis, 5th Edition. Pearson: Prentice Hall International Series in Industrial & Systems Engineering.

Kepner, C. H. and Tregoe, B.B. (2013), The New Rational Manager: An Updated Edition for the New World, Princeton Research Press, Princeton, NJ.

Isaksen, S., Dorval, B., Treffinger, D. (2011), Creative Approaches to Problem Solving: A Framework for Innovation and Change, Sage, Los Angeles, CA.

Laughlin, P. (2011), Group Problem Solving, Princeton University Press, Princeton, NJ.

Fogler, H.C., and Leblanc, S. E. with Rizzo, B. (2014) Strategies for Creative Problem Solving. Web resource: <http://www.umich.edu/~scps/>

Course Information:

- a. Description – This course covers the experiential component of the Systems Analysis and Design course. The students are exposed to the exercises where they can apply the concepts, tools, techniques, and activities of systems analysis and design such as situation appraisal, problem analysis, decision analysis, potential problem analysis and the various tools to be used in each stage. Further, they are drilled on the integration of all these tools in a systems study term project. This course develops the critical systems thinking and decision making skills required of an industrial engineer.
- b. Prerequisites/Co-requisites: DEANSYS
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to conduct proper situation appraisal in a holistic integrative fashion and formulating well defined engineering problems.
 - 2. The student will have the ability to analyze and solve engineering problems correctly using appropriate tools and systems thinking.
- b. Student outcomes
 - SO-E. An ability to recognize, formulate, and solve engineering problems.

Brief List of Topics to be Covered:

- Fundamental of Systems
- Definition of Systems and Systems Approach
- Systems Development Life Cycle
- Application of the Systems Approach
- Systems Study Outline
- The Research Problem and Its Setting
- Review of Related Literature
- Kepner Tregoe (KT) Situation Appraisal
- Problem Identification
- Defining Concerns
- Breaking Down Concerns Into Manageable Components
- Problem Prioritization
- Problem Analysis Techniques
- KT Problem Analysis Technique
- Affinity/ Relationship Diagram
- Cause and Effect Analysis
- Stream Diagnosis
- Why-Why Diagram
- Problem-Tree Analysis
- Systems Design
- Defining the Decision Statement
- Generation and Evaluation of Alternatives
- Design Framework
- Decision Analysis for Mutually exclusive alternatives
- DA for Non-mutually exclusive alternatives
- Potential Problem Analysis
- PPA Approaches
- Detailed Design of Proposed Systems
- System Implementation and Monitoring
- Implementation Planning
- Implementation Strategies
- Monitoring and Maintenance

Course Name/Course Code: **Introduction to Discrete Event Simulation-Lab
(LBYIEEG)**
Credits and Contact Hours: 1 unit (3 hours lab)
Instructor: Dennis T. Beng Hui

Textbook and Online Resources:

Discrete Event System Simulation by J. Banks, J. Carson, B. Nelson and D. Nicol;
Prentice Hall International Series (Latest Edition Available)
Simulation Modeling and Analysis by A. Law and D. Kelton; McGraw-Hill, Inc.
Simulation with ARENA by W. David Kelton, Randall Sadowski, and Nancy Zupick
(2014)
Hillier, F. (2011). Introduction to Management Science: A Modeling and Case Studies
Approach With Spreadsheets. Boston: McGraw-Hill
Denardo, E. (2011). Linear Programming and Generalizations: A Problem-Based
Introduction With Spreadsheets. Boston, MA: Springer U.S.
Heinz, S. (2011). Mathematical Modeling. Berlin, Heidelberg: Springer
Taha, H. (2007). Operations Research: An Introduction, 8th Edition. New Jersey: Prentice
Hall.
Ravindran, A. (2009). Operations Research Applications. Florida: CRC Press/Taylor &
Francis Group.
Discrete Event Simulation. Retrieved from
http://en.wikipedia.org/wiki/Discrete_event_simulation
Simulation. Retrieved from <http://en.wikipedia.org/wiki/Simulation>
Simulation. Retrieved from
<http://www.eg.bucknell.edu/~xmeng/Course/CS6337/Note/master/>
Simulation Examples. Retrieved from
<http://www.eg.bucknell.edu/~xmeng/Course/CS6337/Note/master/node10.html>

Course Information:

- a. Description - This course will discuss, illustrate and teach students how simulation should actually be carried out or performed. This will be achieved by giving the students various caseworks in the duration of the term that in turn will provide them with a hands-on experience how to do discrete-event system simulation using MS Excel and a number of simulation software packages.
- b. Prerequisites/Co-requisites: DISCSIM (Co-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to understand the concept of randomness and variability in defining systems.
 - 2. The student will be able to understand how to conduct a simulation study.
 - 3. The student will be able to know how to build a simulation model using the appropriate modeling approach.

4. The student will be able to identify and demonstrate application of simulation concepts in a real world example.
- b. Student outcomes
- SO-H: An understanding of the effects of engineering solutions in a comprehensive context.

Brief List of Topics to be Covered:

- Introduction to Manual Simulation using Excel
- Understanding Random Numbers and Monte Carlo Simulation
- Simulation Using ARENA
- Simulation Using Promodel
- Output Analysis of a Single Model
- Comparison and Evaluation of Alternative Designs

Course Name/Course Code: **System Dynamics Laboratory (LBYIEEH)**
Credits and Contact Hours: 1 unit (3-hour laboratory)
Instructor: Dennis T. Beng Hui

Textbook and Online Resources:

- Business Dynamics by J. Sterman, 2001, McGraw Hill
System Dynamics Modelling: A Practical Approach by R.G. Coyle, 1996, Chapman and Hall
The Fifth Discipline by P. Senge, 1990, Currency Doubleday
Industrial Dynamics by J. Forrester, 1961, MIT Press
Introduction to System Dynamics Modelling with Dynamo by G. Richardson, 1981, Productivity Press
Introduction to Computer Simulation: A System Dynamics Approach by Nancy Roberts (1982), Addison Wesley
Hillier, F. (2011). Introduction to Management Science: A Modeling and Case Studies Approach With Spreadsheets. Boston: McGraw-Hill
Denardo, E. (2011). Linear Programming and Generalizations: A Problem-Based Introduction With Spreadsheets. Boston, MA: Springer U.S.
Heinz, S. (2011). Mathematical Modeling. Berlin, Heidelberg: Springer
Taha, H. (2007). Operations Research: An Introduction, 8th Edition. New Jersey: Prentice Hall.
Ravindran, A. (2009). Operations Research Applications. Florida: CRC Press/Taylor & Francis Group.
<http://www.clexchange.org/curriculum/roadmaps/>
<http://www.systemdynamics.org>
<http://www.systems-thinking.org>

Course Information:

- a. Description – This course covers modeling of influence diagrams, stock-flow diagrams, and mathematical modeling to simulate the dynamics of non-industrial systems. An added focus is to introduce how to identify points of intervention in a system where policies can be tested. The software packages to be used in this laboratory are VENSIM and Professional Dynamo.
- b. Prerequisites/Co-requisites: SYSDYN1 , LBYIEEG (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to identify and understand the meaning of the presence of feedback loops in complex and dynamic systems.
 2. The student will have the ability to model complex system behavior and identify leverage points.
 3. The student will be able to identify and demonstrate application of system dynamic concepts in a real world example.

b. Student outcomes

SO-H. An understanding of the effects of engineering solutions in a comprehensive context.

Brief List of Topics to be Covered:

- Systems Thinking
- Understanding behavior and data
- Defining a Dynamic Problem and its reference mode
- Casual Loop Modeling using Vensim
- Stock Flow Modeling using Vensim
- Simulating and Testing Model Behavior
- Modeling Commodity Cycles

Course Name/Course Code: **Advanced System Dynamics Laboratory (LBYIEEI)**
Credits and Contact Hours: 1 unit (3 hour lab)
Instructor: Dr. Jose Edgar Mutuc

Textbook and Online Resources:

- Sterman, J. (a) (2001), Business Dynamics, McGraw-Hill.
Forrester, J. (1961), Industrial Dynamics, MIT Press
Richardson, G. (1986), Problems with causal-loop diagrams, System Dynamics Review, Vol. 2 (no. 2, Summer 1986), pp.158-170.
Senge, P. (1990), The Fifth Discipline, Currency Doubleday
Saeed, K. (1999), Defining a problem or constructing a reference mode, Social Science and Policy Studies Department, Worcester Polytechnic Institute, Worcester, MA.
Sterman, J. (b) (2002), All Models are Wrong: Reflections on Becoming a Systems Scientist, System Dynamics Review, Vol. 18, No. 4, pp. 501 – 531.
Hillier, F. (2011). Introduction to Management Science: A Modeling and Case Studies Approach With Spreadsheets. Boston: McGraw-Hill
Denardo, E. (2011). Linear Programming and Generalizations: A Problem-Based Introduction With Spreadsheets. Boston, MA: Springer U.S.
Heinz, S. (2011). Mathematical Modeling. Berlin, Heidelberg: Springer
Taha, H. (2007). Operations Research: An Introduction, 8th Edition. New Jersey: Prentice Hall.
Ravindran, A. (2009). Operations Research Applications. Florida: CRC Press/Taylor & Francis Group.
System Dynamics Society. Retrieved from <http://www.systemdynamics.org/>
Morecroft, J. (1982). A Critical Review of Diagramming tools for conceptualizing feedback System Models. Retrieved from <http://www.systemdynamics.org/dynamica/articles/81/5.pdf>
Richardson, George (1986). Problems with Casual Loop Diagram. Retrieved from <http://www.systems-thinking.org/intst/d-3312.pdf>
Saeed, K. (2000). Retrieved from <http://www.wpi.edu/Images/CMS/SSPS/26.pdf>

Course Information:

- a. Description - This is laboratory complement of SYSDYN2, the advanced course in system dynamics. The course provides the venue to apply the advanced concepts of system dynamics and learn the windows-based system dynamics modeling software, STELLA. The students will be required to model complex systems with more interactive components and factors. These systems not only include manufacturing systems but also broader organizational, economic and social environments. It covers the details into model formulation, with special emphasis on decisions and policies. It focuses on the decision-making and policy design to improve system behavior.
- b. Prerequisites/Co-requisites: SYSDYN2(Co-requisite), LBYIEEH (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

a. Specific outcomes

1. The student will have the ability to apply the basic knowledge of physical, information and social theories and concepts needed in identifying a reference mode and developing causal loop models
2. The student will be able to apply the basic knowledge of mathematical theories and concepts formulating equations and simulating the stock flow diagrams.

b. Student outcomes

SO-B An ability to design and conduct experiments, as well as to analyze and interpret data.

SO-H An understanding of the effects of engineering solutions in a comprehensive context

Brief List of Topics to be Covered:

- Review of System Dynamics
 - Review of SD concepts
 - Review of SD Methodology
- Advanced reference mode analysis
- Modelling variables and processes
- Decisions and decision making
- Base runs and term projects
- Parameters sensitivity
 - Parameters
- Behavior and sensitivity
- Leverage points
- Modelling alternative solutions
- Evaluation alternative solutions
 - Identifying performance indicators
 - Simulating solutions at time t

Course Name/Course Code: **Advance Computer Programming (LBYIET1)**
Credits and Contact Hours: 2 units (6-hour laboratory)
Instructor: Ronald Polancos

Textbook and Online Resources:

- Albright, S. (2011). VBA for Modelers: Developing Decision Support Systems. Cengage Learning.
- Walkenbach, J. (2013). Excel 2013 Power Programming with VBA (Vol. 13). John Wiley & Sons.
- Mansfield, R. (2013). Mastering VBA for Microsoft Office 2013. John Wiley & Sons
- Zak, D. (2014), Clearly Visual Basic: Programming with Microsoft Visual Basic 2012 (3rd edition). Cengage Learning Asia
- Hoisington, C. (2014), Microsoft Visual Basic 2012 for Windows Applications: Introductory (1st edition). Cengage Learning Asia
- Schneider D. (2013), An Introduction to Programming with Visual Basic 2012 (9th edition). Pearson International
- Deitel A., Deitel H., Deitel P. (2013), Visual Basic 2012: How to Program (6th edition). Pearson International
- Irvine, K., Gaddis, T. (2013), Starting Out with Visual Basic (6th edition). Pearson International
- VBA Language Reference (2010). [http://msdn.microsoft.com/en-us/library/gg264383\(v=office.14\)](http://msdn.microsoft.com/en-us/library/gg264383(v=office.14))
- VBA Language Reference (2007). [http://msdn.microsoft.com/en-us/library/ee441269\(v=office.12\)](http://msdn.microsoft.com/en-us/library/ee441269(v=office.12))

Course Information:

- a. Description - This LBYIET course is an introduction to the intellectual enterprise of computer science and the art of programming. This course teaches students how to think algorithmically and solve problems efficiently. The topics covered will provide students with the technical capability and knowledge on how they might use computer programming to address Industrial Engineering related issues
- b. Prerequisites/Co-requisites: SYSINDE (Co-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to apply the basic knowledge of information science concepts in developing productivity applications
 2. The student will be able to evaluate and understand real world systems using the concepts learned in Industrial Engineering and Visual Basic for Applications (VBA)
 3. The student will be able to develop a productivity application that will address the need(s) of a hypothetical real world system studied.

4. The student will be able to determine the impact of the productivity application developed to the work done by the user
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering
 - SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.
 - SO-H. An understanding of the effects of engineering solutions in a comprehensive context.

Brief List of Topics to be Covered:

- Introduction to VBA
 - Using Macros
 - Basics of the editor
 - Editing Macros
 - Creating Code from Scratch
- Understanding VBA
 - VBA syntax
 - Variables
 - Arrays
 - Objects
- Making VBA think
 - Built-in functions
 - Creating functions
 - Loops
 - Decisions
- Creating Custom Forms
 - Getting user input
 - Creating dialog boxes
 - Advance dialog boxes

Course Name/Course Code: **Structured Query Language Database Laboratory (LBYIET2)**
Credits and Contact Hours: 1 unit (3-hour laboratory)
Instructor: Ronald Polancos

Textbook and Online Resources:

Hernandez, Michael (2013). Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design 3rd Ed. Edwards Brothers Mallo
Connolly, T. M., & Begg, C. E. (2014). Database systems: a practical approach to design, implementation, and management. Pearson International.
Provost, F., & Fawcett, T. (2013). Data Science for Business: What you need to know about data mining and data-analytic thinking. O'Reilly Media, Inc
Kroenke, D., & Auer, D. (2013). Database: Processing (13th edition). Pearson International.
Morris, S., Rob, P., & Coronel, C. (2013), Database Principles: Fundamentals of Design, Implementation, and Management (10th edition). Cengage Learning Asia
Introduction to Databases. <https://class2go.stanford.edu/db/Winter2013/preview/>
Database application. http://en.wikipedia.org/wiki/Database_application
Database Design. Retrieved from http://en.wikipedia.org/wiki/Database_design

Course Information:

- a. Description - This is the laboratory course to an introductory course to database applications. Laboratory cases will cover topics on database design and Visual Basic for Applications.
- b. Prerequisites/Co-requisites: IEBSDAT (Co-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to apply the basic knowledge of information science concepts in developing database applications
 - 2. The student will be able to identify and recognize system problems that can be addressed by a database applications
 - 3. The student will be able to conceptualize database applications that meet business requirements
 - 4. The student will be able to develop database applications
 - 5. The student will be able to identify decisions that can be made using the database application that was developed
- b. Student outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering

SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.

SO-H. An understanding of the effects of engineering solutions in a comprehensive context.

Brief List of Topics to be Covered:

- Review of VBA
- Creating Effective Code
- Programming Office Applications: Word
- Programming Office Applications: Excel
- Database Applications: Building a Database
- Creating Database Applications

Course Name/Course Code: **Enterprise Applications Laboratory (LBYIET3)**
Credits and Contact Hours: 1 unit (3-hour laboratory)
Instructor: Ronald Polancos

Textbook and Online Resources:

Wagner, Bret; Monk, Elleen (2013), Concepts in Enterprise Resource Planning (4th Edition). Cengage Learning Asia
Summer, Mary (2013), Enterprise Resource Planning. Pearson: New International Edition
Van Weele, Arjan J. (2014), Purchasing and Supply Chain Management (6th edition). Cengage Learning Asia
Kachinske, Edward; Kachinske, Adam; Kachinske, Timothy (2012), Maximizing your sales with Microsoft Dynamics CRM 2011 (1st edition). Cengage Learning Asia
Satzinger, J. W., Jackson, R. B., Burd, Stephen D. (2014), Introduction to Systems Analysis and Design (6th edition). Cengage Learning Asia
Rosenblatt H. J. (2014), Systems Analysis and Design (10th edition). Cengage Learning Asia

Course Information:

- a. Description - This laboratory-type LBYIET3 course is an introductory course in Enterprise Application Systems that provides an overview in the concepts, processes and functions of Trade and Logistics, Inventory Management, Warehouse Management, and Manufacturing. This course prepares the student for a Certification in an Enterprise System.
- b. Prerequisites/Co-requisites: APLIET (Co-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to design an enterprise planning system configuration based on functional roles in an organization
- b. Student outcomes
SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.

Brief List of Topics to be Covered:

- Introduction to NAV
- Customizing NAV
- Basic Functionalities
- Sales Order Management
- Purchase Order Management

Course Name/Course Code: **LBYIMEA**
(Advanced Quantitative Methods-Laboratory)
Credits and Contact Hours: 1 unit (3-hour laboratory)
Instructor: Mr. Eric A. Siy

Textbook and Online Resources:

Montgomery D. C. (2009) Design and Analysis of Experiments, 7th Edition. Asia: John Wiley and Sons, Inc.
Garcia-Diaz A. and Phillips D.T. (1995) Principles of Experimental Design and Analysis. Chapman and Hall.
Bartee E. M. (1968) Engineering Experimental Design Fundamentals. N.J.: Prentice Hall.
Montgomery, D.C. and Myers R.H. (2002) Response Surface Methodology: Process And Product Optimization Using Designed Experiments. N.Y: Wiley.
Box G. E. P. and Draper N.R. (1987) Empirical Model Building and Response Surfaces. N.Y.: Wiley.
Minitab Website: <http://www.minitab.com/en-us/products/minitab/>
Design Expert Website. www.statease.com.
ASQ on Design of Experiments. <http://asq.org/learn-about-quality/data-collection-analysis-tools/overview/design-of-experiments.html>

Course Information:

- a. Description - This course primarily covers statistical design of experiments (DOE) as well as the analysis and interpretation of its results. It will also tackle sampling techniques and graphical data display and descriptions.
- b. Prerequisites/Co-requisites: QUAMET2
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to clearly identify objectives for an experimentation process or activity.
 - 2. The student will be able to collect sufficient and appropriate data according to the objectives of the experiment.
 - 3. The student will be able to analyze the results of experimentation using the appropriate statistical tools.
 - 4. The student will be able to accurately detect and describe patterns and behaviors in experimental or observational data
 - 5. The student will be able to build proper deductions and linkages between the obtained statistical results of the experimental data and the hypotheses /objectives of the experiment.
 - 6. The student will be able to create appropriate visual presentation materials about experimental results.

b. Student outcomes

SO-B An ability to design and conduct experiments, as well as to analyze and interpret data.

SO-G An ability to effectively communicate orally and in writing using the English language.

Brief List of Topics to be Covered:

- Introduction to Statistical Computer software
- Microsoft Excel™ Data Analysis Add-in
- Minitab
- Graphical Data Descriptions
 - Describing Data Using One Variable
 - Describing Data Using Two or More Variables
 - Describing Data Using Statistical Software
- Introduction to Design of Experiments
- Factorial Experiments
- Blocking Design
- Screening Experiments
- Fractional Factorial Design
- Plackett-Burman Design
- Analysis and Interpretation in Screening Designs
 - Using Design Expert Software in Screening Designs
- Response Surface Methodology

Course Name/Course Code: **Physical Ergonomics Laboratory (LBYIMEB)**
Credits and Contact Hours: 1 unit (3 hours laboratory)
Instructor: Ms. Jazmin Tangsoc

Textbook and Online Resources:

- Bridger, R.S. (2009) Introduction to Ergonomics, 3rd edition, CRC Press
Helander, M. (2006) A Guide to Human Factors and Ergonomics. Florida: CRC Taylor and Francis
Kroemer, K.H.E, Kroemer H.B. & Kroemer-Elbert, K.E. (latest edition) Ergonomics How to Design for Ease and Efficiency 2nd edition, Prentice-Hall, New Jersey.
Kumar, S. (2008) Biomechanics in Ergonomics, CRC Press
Marras, W. & Karwowski, W. (2006) The Occupational Ergonomics Handbook. Florida: CRC/Taylor and Francis.
Salvendy, G. (2006) Handbook of Human Factors and Ergonomics 3rd edition. New Jersey: John Wiley.
Duffy, V. (2011) Advances in Human Factors, Ergonomics, and Safety in Healthcare. Florida: CRC Press.
Bhise, V. (2012) Ergonomics in the Automotive Design Process. Florida: CRC Press.
McCauley-Bush, P. (2012) Ergonomics: Foundational Principles, Applications, and Technologies. Florida: CRC Press.
Learning and memory. (2010). Retrieved from <http://nwlink.com/~donclark/hrd/learning/memory.html>
Details of a usability study. (2011). Retrieved from <http://www.user.com/testing-details.htm>
Usability Professionals Association. <http://www.upassoc.org/>
Darnell, M. (2011). Bad human factors designs. Retrieved from <http://www.baddesigns.com/>

Course Information:

- a. Description - This course is the laboratory component of physical ergonomics. Experiments conducted in this class supplement the theories learned on illumination, noise, anthropometry, posture analysis, and manual material handling. Some of the experiments are conducted in the field to gather real time data.
- b. Prerequisites/Co-requisites: ERGBIO1 (Co-requisite), LBYIMEA (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to measure illumination in a specific working environment using standard method and identify improvement in lighting systems.

2. The student will be able to measure noise levels, identify deviation from standards, and propose interventions
 3. The student will be able to identify appropriate workstation dimensions using anthropometric data
 4. The student will be able to measure postural angles of the body and determine changes in workstation design to address poor postures
 5. The student will be able to design an experiment to show the concept of lifting index using NIOSH Equation and propose changes to minimize lifting index.
- b. Student outcomes
- SO-B. An ability to design and conduct experiments as well as to analyze and interpret data.
- SO-D. An ability to work effectively in multi-disciplinary and multi-cultural teams.
- SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Illumination
- Noise
- Anthropometry

Course Name/Course Code: **Cognitive Ergonomics Laboratory (LBYIMEC)**
Credits and Contact Hours: 1 unit (3 hours laboratory)
Instructor: Dr. Rosemary R. Seva

Textbook and Online Resources:

Douglas, I., & Liu, Z. (Eds.). (2011). *Global Usability*. London: Springer.
Goldstein, E. B. (2009). *Sensation and perception* (8th ed.). London: Wadsworth.
Karwowski, W., Soares, M., & Stanton, N. (Eds.). (2011). *Human Factors and Ergonomics in Consumer Product Design: Methods and Techniques* London: CRC Press.
Sternberg, R. (2008). *Cognitive psychology* (5th ed.). London: Wadsworth.
Wickens, C. D., & Hollands, J. G. (2000). *Engineering Psychology and Human Performance* (3rd ed.). New Jersey: Prentice Hall.
Cognitive ergonomics: a definition. Retrieved from <http://www.haworth.com/en-us/Knowledge/Workplace-Library/Documents/Cognitive-Ergonomics-A-Definition.pdf>
Heeger, D. (2007). Signal detection theory. Retrieved from <http://www.cns.nyu.edu/~david/handouts/sdt/sdt.html>
Learning and memory. (2011). Retrieved from <http://nwlink.com/~donclark/hrd/learning/memory.html>
Details of a usability study. (2011). Retrieved from <http://www.user.com/testing-details.htm>
Usability Professionals Association. <http://www.upassoc.org/>
Darnell, M. (2011). Bad human factors designs. Retrieved from <http://www.baddesigns.com/>

Course Information:

- a. Description - This is a one-term, three hour per week laboratory class for application of tools and techniques in Cognitive Ergonomics.
- b. Prerequisites/Co-requisites: ERGCOG2 (Co-requisite), LBYIMEB (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will have the ability to compute sensitivity and bias in a signal detection experiment and explain its causes.
 - 2. The student will have the ability to determine causes of vigilance decrement for a task over time.
 - 3. The student will have the ability to design an experiment to validate information theory.
 - 4. The student will have the ability to identify factors affecting performance in a memory task
 - 5. The student will have the ability to prepare a usability report

6. The student will have the ability to make an oral presentation about the experiment report
- b. Student outcomes
- SO-B. An ability to design and conduct experiments as well as to analyze and interpret data
 - SO-D. An ability to work effectively in multi-disciplinary and multi-cultural teams
 - SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Signal Detection Theory
- Change Detection
- Information Theory
- Memory
- Usability testing

Course Name/Course Code: **Methods Engineering Laboratory (LBYIMEE)**
Credits and Contact Hours: 1 unit (3 hours laboratory)
Instructor: Giselle Joy C. Esmeria

Textbook and Online Resources:

- Niebel, B and Frievalds, A. (2002). *Methods, Stands, & Work Design*, New York: McGraw Hill
- Groover, M. P. (2007). *Work Systems: The Methods, Measurement & Management of Work*, Prentice Hall,
- Chang, Tien-Chien, Richard A Wysk, and Hsu-Pin Wang (2006). *Computer-Aided Manufacturing* (3rd ed). New Jersey: Pearson Education, Inc.
- Groover, M. P. (2008). *Automation, Production Systems, and Computer-Integrated Manufacturing*. New Jersey: Prentice Hall.
- Atienza, R. (2011) *Handbook on Work Measurement*.(Beta Ed.) Manila: PolyStar Graphics
- AMHSA - Representing the UK Logistics Automation and Handling Industry. (n.d). Retrieved from <http://www.amhsa.co.uk>.
- Robotics Online. (2008). Retrieved from <http://www.robotics.org>.

Course Information:

- a. Description - This is a three-hour per week laboratory class for application of tools and technique on work improvement and measurement
- b. Prerequisites/Co-requisites: IMEPRO2
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to describe and analyze workplace conditions and practices for factors that hinder productivity
 2. The student will be able to apply different types of engineering work methods such as charting and diagrams techniques in operations and job analysis.
 3. The student will be able to apply various types of industrial engineering work measurements such as direct time study, predetermined motion time systems and work sampling in analyzing time of tasks.
 4. The student will be able to work in a team and communicate effectively in performing the assigned tasks.
- b. Student outcomes
 - SO-D. An ability to work effectively in multi-disciplinary and multi-cultural teams

Brief List of Topics to be Covered:

- Line Balancing/Work Content
 - Determining bottleneck, capacity, productivity, utilization of the process using precedence diagram with partitioning
 - Balancing of operation line.
 - Determining and eliminating additional work content.

- Process Charting and Analysis
 - Documentation and Improvement of Process Using cue or matrix FPC and FD
 - Documentation and Improvement of Process Using OPC and FD
 - Documentation and Improvement of Process Using MAC and time-scaled LHRHC
 - Integration of previously-learned tools and concepts

- Time Study by Stopwatch/Video
 - Determining time standards using video and stopwatch,
 - Applying rating and allowance factors

- Time Study by GTT/Work Sampling

Course Name/Course Code: **Product Design Laboratory (LBYIMEF)**
Credits and Contact Hours: 1 unit (3 hour laboratory)
Instructor:

Textbook and Online Resources:

- Boothroyd, G. (2005) Assembly Automation and Product Design Taylor and Francis
Cross, N. (2008) Engineering Design Methods: Strategies for Product Design. Chichester Wiley
Dieter, G. (2000) Engineering Design 3rd edition. McGraw Hill Singapore
Haskell, B. (2004). Portable Electronics Product Design and Development for Cellular Phones, PDAs, Digital Cameras McGraw Hill, USA
Karwowski, W. (2011) Human Factors and Ergonomics in Consumer Product Design Methods and Techniques CRC Press Taylor and Francis Group Boca Raton
Kroemer, K.H.E, Kroemer H.B. & Kroemer-Elbert, K.E. (2001) Ergonomics How to Design for Ease and Efficiency 2nd edition, Prentice-Hall, New Jersey.
Morris, R. (2009) The Fundamentals of Product Design. Lausanne: AVA
Palady, P. (1998) Failure Mode and Effects Analysis : Risk analysis and Risk management, 2nd edition, PAL Publication.
Ulrich, K. and Eppinger, S. (2008) Product Design and Development 4th edition McGraw Hill, USA

Course Information:

- a. Description - This course is the laboratory component of Product Design. Activities conducted in this class supplement the theories learned on human centric design, quality function deployment, value engineering and failure mode and effects analysis
- b. Prerequisites/Co-requisites: PRODSCI (Co-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to identify customer requirements when designing products.
 2. The student will be able to develop a prototype.
 3. The student will be able to prepare a written report that documents the product design process undertaken.
- b. Student outcomes
 - SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.
 - SO-G. An ability to effectively communicate orally and in writing using the English language.

Brief List of Topics to be Covered:

- Review of related products
- Survey of customer requirements
- House of Quality
- Alternative designs
- Product prototype
- Product risk analysis or testing

Course Name/Course Code: **Methods of Research (MERESIE)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Dr. Shun Fung Chiu

Textbook and Online Resources:

- Graziano and Raulin (2013). Research Methods: A Process of Inquiry. 8th edition. Pearson. Emerging Areas in Industrial Engineering and Operations Research. <https://www.youtube.com/watch?v=IJY4oLXcaSs> Retrieved May 26, 2017.
- Committee on Science, Engineering, and Public Policy, National Academy of Sciences, National Academy Of Engineering, Institute of Medicine, On Being a Scientist: Responsible Conduct in Research, 3rd Ed, Washington, DC, National Academy Press, 2009.
- De La Salle University Research Ethics Office guidelines. <http://www.dlsu.edu.ph/offices/reo/forms.asp> Retrieved May 26, 2017
- Ochsner, a. (2013) Introduction to Scientific Publishing: Backgrounds, Concepts, Strategies. Heidelberg: Springer.
- DX6 Design of Experiments S/W (<http://www.Statease.com/x6betaup>)
- Research Methods Knowledge Base, 2nd ed., 1999 (<http://trochim.human.cornell.edu/kb>)

Course Information:

- a. Description - This course introduces the students to the fundamental knowledge of research covering the entire research process including formulating research questions; sampling, measurement, research design, data analysis and writing the research proposal.
- b. Prerequisites/Co-requisites: ENGLRES (Hard Pre-requisite), ERGCOG2 (Soft Pre-requisite), INOPER2 (Soft Pre-requisite), IMEPRO1 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to write an original research paper and respect intellectual properties
 2. The student will be able to discuss the ethical considerations in situations that commonly arise during the conduct of research.
 3. The student will be able to understand and develop a working hypothesis, problem statement, and theoretical framework for a chosen scientific research topic in industrial engineering that is beneficial to the society.
 4. The student will be able to select and critique literature relevant on a chosen scientific research topic, and design the appropriate research operational frameworks.
 5. The student will be able to determine appropriate methods and data necessary to conduct research on a chosen topic.
 6. The student will be able to understand the data dynamics and interpretation

7. The student will be able to understand the delivery of research result, conclusion, and recommendation of future studies.
8. The student will be able to write a thesis proposal on the chosen topic that complies with departmental standards covering problem statement, literature review, frameworks, methodology identification, and references.

b. Student outcomes

SO-F. A recognition of professional, social, and ethical responsibility

SO-G. An ability to effectively communicate orally and in writing using the English language

SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization

Brief List of Topics to be Covered:

- Introduction
- Issue-idea-generating and problem-definition phase
- Procedures-design phase
- Observation and data analysis phase
- Interpretation phase
 - Result discussion, conclusion, future studies
- Communication phase
 - Abstract / thesis and journal paper writing
 - References and appendices
 - Publication style guide

Course Name/Course Code: **Occupational Safety and Health (OCCHSAF)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Dr. Alma Maria Jennifer A. Gutierrez

Textbook and Online Resources:

- Goetsch, D. (2011) Occupational Safety and Health for Technologists, Engineers and Managers 7th Edition. Prentice Hall, New Jersey.
- Petersen, D (1996) Human Error Reduction and Safety Management 3rd Edition. John Wiley and Sons.
- Wentz, C.(1999) Safety, Health and Environment Protection. Mc-Graw Hill Book Company
- Sibal J. and Atienza T. (2010) Corporate Social Responsibility and Occupational Safety and Health, Central Book Supply.
- EncyclopaediaBrittanica Blog, March 2011, The Triangle Shirtwaist Factory Fire from Tragedy from Turning Point ,Available: <http://www.britannica.com/blogs/2011/03/triangle-shirtwaist-factory-fire-tragedy-turning-point-workers-rights/>
- Health and Safety Authority, 2011. Hazards- Manual Handling. Available: http://www.hsa.ie/eng/topics/hazards/manual_handling_hazards
- ISSA, 2012, Slips, Trips and Falls in the workplace. Available: http://www.issa.com/?id=shp_slips_trips_falls_in_the_workplace
- Occupational Safety and Health Administration (n.d.) Occupational Safety and Health Administration. Available: <http://www.osha.gov/pls/oshaweb>
- Lu, J. 2008, "Occupational Hazards and Illnesses of Filipino Women Workers in Export Processing Zones", International Journal of Occupational Safety and Ergonomics (JOSE) Vol. 14, No. 3, pp.333-342

Course Information:

- a. Description - The course aims to foster an understanding on the moral responsibility of industrial engineers to safety and health. Systems analysis and design techniques will be applied in the context of improving a company's safety practices.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to perform a safety audit in a company.
 2. The student will be able to recommend safety strategies regarding hazardous issues/concerns (fire, biological and fall and lifting) faced by communities.
 3. The student will have the ability to analyze and solve ethical issues faced by safety and health professionals.
- b. Student outcomes
SO-E. An ability to recognize, formulate, and solve engineering problems.

- SO-F. A recognition of professional, social, and ethical responsibility
SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Course overview
- Definition of health and safety
- Health and safety movement, then and now
- Ethics and Safety
- The Modern Health and Safety Team
- Promoting Safety
- Assessing Facilities for Safety and Health
- Personal Protective Equipment
- Human Error and System Caused Human Error
- Accidents and their effect on Industry
- Impact of Automation in the Workplace
- Risk management introduction
- Fault tree analysis
- Event analysis
- Assessing communities' safety and health

Course Name/Course Code: **Operations Research Elective 1 (ORE1LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Dennis Cruz

Textbook and Online Resources:

- Hillier, F.S., and Lieberman, G.J.(2010). Introduction to Operations Research 9th Edition. McGraw Hill, Singapore.
- Ignizio, J., and Cavalier, T. (1994).Linear Programming. Prentice Hall, Englewood Cliffs, NJ, USA
- Rao, S. (1996). Engineering Optimization: Theory and Practice 3rd Edition. Wiley-Interscience, Englewoods Cliffs NY, USA
- Ravindran, A. Phillips D., Solberg J. (1987).Operations Research: Principles and Practice2nd Edition. John Wiley and Sons, Singapore.
- Taha, H. (2006). Operations Research: An Introduction 8th Edition. Prentice Hall, Englewood Cliffs, NJ, USA
- Williams, H.P. (1999). Model Building in Mathematical Programming 4th Ed. John Wiley and Sons, Singapore

Course Information:

- a. Description - This course covers applications and concepts on Large Scale Models on Linear Programming and Integer Linear Programming. Discuss concepts on Karmarkar Algorithm, Kachian's Ellipsoid Method, and Decomposition. Apply Linear Programming concepts for Data Analysis. Use software such as EXCEL Spreadsheet and General Algebraic Modeling System (GAMS) in solving for these large-scale models. Discuss concepts Multiobjective Models and Optimization.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to formulate and solve Large Scale LP and ILP models.
 2. The student will be able to formulate and solve multiple objective and multiple attribute decision making models using the appropriate methodology.
 3. The student will be able to use proficiently the software (EXCEL-Solver and GAMS) in solving LP and ILP Models.
 4. The student will be able to integrate concepts of mathematical modelling with other IE concepts and techniques in analyzing system and finding solutions.
- b. Student outcomes
 - SO-E. An ability to recognize, formulate, and solve engineering problems
 - SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

Brief List of Topics to be Covered:

- Review on Model Formulations
- Large Scale Linear Programming
- Using Excel for Solving LP Models
- Application of LP Models in Information Technology
- Using General Algebraic Modeling System (GAMS)
- Multi-objective Optimization
- Multi-objective Models
 - Weighing of Objectives
 - Establishment of Aspiration Level
 - The Processing of Goals
 - Weighing Unwanted Goal Deviations
 - The Ranking of Goals
 - Scaling and Normalization of Goals
 - Development of Achievement Vector
 - The Multiplex Approach
 - Multiplex Models
- Good and Poor Modeling Practices

Course Name/Course Code: **Operations Research Elective 2 (ORE2LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Dennis Cruz

Textbook and Online Resources:

- Heinz, S. (2011). Mathematical Modeling. Berlin, Heidelberg: Springer
- Albright, S. (2012). Management Science Modeling. Australia: South-Western/Cengage Learning
- Beck, A. (2014). Introduction to Nonlinear Optimization: Theory, algorithm, and Application with MATLAB.
- Hillier, F. (2011). Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets. Boston, MA: Springer U.S.
- Ruszczynski, A. (2011). Nonlinear Optimization. Princeton University Press.
- Lange, K. (2013). Optimization. Springer Science and Business Media.
- Rao, S. (2009). Engineering Optimization: Theory and Practice 4th Edition. Wiley-Interscience, Englewoods Cliffs NY, USA
- Winston, W. (2004). Operations Research: Applications and Algorithms 4th Edition.
- Bazaraa, M, Sherali, H., and Shetty, C.M. (2006). Non-Linear Programming: Theory and Algorithms 3rd Edition. John Wiley and Sons, Singapore.
- Ravindran, A. Phillips D., Solberg J. (1987).Operations Research: Principles and Practice 2nd Edition. John Wiley and Sons, Singapore.
- Taha, H. (2006). Operations Research: An Introduction 8th Edition. Prentice Hall, Englewood Cliffs, NJ, USA
- Floudas C. (1999). Non-Linear and Mixed Integer Optimization: Fundamentals and Applications.
- Bradley, S., Hax, A., and Magnanti, T. (1977). Applied Mathematical Programming. Addison-Wesley Publishing Company.
- MIT. Introduction to Nonlinear Programming. Retrieved on August 7, 2015 from <http://web.mit.edu/15.053/www/AMP-Chapter-13.pdf>
- Boyd, Stephen, Kim, Seung-Jean, Vandenberghe, Lieven, and Hassibi, Arash. A Tutorial on Geometric Programming. Retrieved on August 7, 2015 from http://stanford.edu/~boyd/papers/pdf/gp_tutorial.pdf
- Quadratic Programming . Retrieved on August 7, 2015 from http://www.math.uh.edu/~rohop/fall_06/Chapter3.pdf
- Jensen, Paul and Bard, Jonathan. Operations Research Models and Methods. Retrieved on August 7, 2015 from https://www.me.utexas.edu/~jensen/ORMM/supplements/methods/nlpmethod/S1_separable.pdf
- L. Vandenberghe. Linear-fractional optimization. Retrieved on August 7, 2015 from <http://www.seas.ucla.edu/~vandenbe/ee236a/lectures/lfp.pdf>

Course Information:

- a. Description - This course covers formulation of non-linear models, applications and concepts on non-linear programming. Solution techniques to solve non-linear models will also be discussed. These are quadratic programming, geometric programming, separable programming, and fractional programming. Use General Algebraic Modeling System (GAMS) and EXCEL-Solver in solving for these large-scale non-linear models.

- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to formulate and solve non-linear programming (NLP) models.
 2. The student will be able to prove convexity/concavity of non-linear models.
 3. The student will be able to use proficiently the software (EXCEL-Solver and GAMS) in solving NLP Models
 4. The student will be able to integrate concepts of mathematical modelling with other IE concepts and techniques in analyzing system and finding solutions.
- b. Student outcomes
 - SO-E. An ability to recognize, formulate, and solve engineering problems
 - SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

Brief List of Topics to be Covered:

- Introduction to Non-Linear Model
- Conversion to Linear Model
- Review of Optimization Theory
- General Algebraic Modeling System (GAMS)
- Solution Techniques to Non-Linear Model

Course Name/Course Code: **Operations Research Elective 3 (ORE3LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Dennis Cruz

Textbook and Online Resources:

- Hillier, F.S., and Lieberman, G.J.(2010). Introduction to Operations Research 9th Edition. McGraw Hill, Singapore.
- Ignizio, J., and Cavalier, T. (1994).Linear Programming. Prentice Hall, Englewood Cliffs, NJ, USA
- Rao, S. (1996). Engineering Optimization: Theory and Practice 3rd Edition. Wiley-Interscience, Englewoods Cliffs NY, USA
- Ravindran, A. Phillips D., Solberg J. (1987).Operations Research: Principles and Practice2nd Edition. John Wiley and Sons, Singapore.
- Taha, H. (2006). Operations Research: An Introduction 8th Edition. Prentice Hall, Englewood Cliffs, NJ, USA
- Williams, H.P. (1999). Model Building in Mathematical Programming 4th Ed. John Wiley and Sons, Singapore
- Eckstein, Jonathan. Guideline and Hints for Formulating Linear Programming Problems. Retrieved on June 5, 2015. Retrieved from <http://web.mat.bham.ac.uk/Y.Xia/om/notes/formguide.html>
- Washington University. Formulating Linear Programming Models. Retrieved on Jun3 5, 2015. Retrieved from <http://faculty.washington.edu/mhillier/ba502/Formulation.pdf>
- MIT. Big O Notation. Retrieved on June 5, 2015. Retrieved from http://web.mit.edu/16.070/www/lecture/big_o.pdf
- Appendix E: Karmarkar’s Method. Retrieved on June 5, 2015. Retrieved from <http://math.gmu.edu/~igriva/book/Appendix%20E.pdf>
- Jones, Dylan. Goal Programming Tutorial. Retrieved on June 5, 2015. Retrieved from http://www.mat.ucm.es/imeio/cursos/EPS_MCDM/Documents/Dj-euro_phdschool.pdf

Course Information:

- a. Description - This course covers applications and concepts on Large Scale Models on Linear Programming and Integer Linear Programming. Discuss concepts on Karmarkar Algorithm, Kachian’s Ellipsoid Method, and Decomposition. Apply Linear Programming concepts for Data Analysis. Use software such as EXCEL Spreadsheet and General Algebraic Modeling System (GAMS) in solving for these large-scale models. Discuss concepts Multiobjective Models and Optimization.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to formulate and solve LP and ILP models.

2. The student will be able to formulate and solve multiple objective and multiple attribute decision making models using the appropriate methodology
3. The student will be able to use proficiently the software (EXCEL-Solver and GAMS) in solving LP and ILP Models
4. The student will be able to integrate concepts of mathematical modelling with other IE concepts and techniques in analyzing system and finding solutions.

b. Student outcomes

SO-E. An ability to recognize, formulate, and solve engineering problems

SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

Brief List of Topics to be Covered:

- Review on Model Formulations
 - Applications of LP and ILP
 - Dealing with Problem Size and Complexity
 - Guidelines in Model Building
 - Steps in Model Formulation
 - Assumptions of LP and ILP Models
 - Establishing Model Validity
- Integration of Uncertainty
- Review of duality
 - Formulation uncertain LP and ILP
 - Transformation of uncertain LP and ILP into their dual counterparts
- Introduction to Robust Optimization
 - Model formulation
 - Application of Uncertain Models in Real World Problems
- Using MATLAB to Solve Robust Optimization Problems
- Development of Algorithms to Solve Complex Robust Optimization Problems
 - Review of bisection search/golden search methods

Course Name/Course Code: **Industrial Engineering Practicum (PRCIEE1)**
Credits and Contact Hours: 2 units
Instructor: Dennis Cruz

Textbook and Online Resources:

None

Course Information:

- a. Description - On-the-Job training will expose the students to the different tasks and responsibilities being assigned to an industrial engineer. This includes exposure to manufacturing companies, service systems, industrial or power plants, research activities, design projects and others
- b. Prerequisites/Co-requisites: PERSEF2 (Hard Pre-requisite), FACPLAD (Soft Pre-requisite), IMEPRO3 (Soft Pre-requisite), PRODSCI (Soft Pre-requisite), LBYIMEF (Soft Pre-requisite), INOPER3 (Soft Pre-requisite), SYSINFO (Soft Pre-requisite), LBYME32 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will develop and instill a positive attitude, self-confidence and self-motivation required of a responsible professional in handling tasks.
 2. The student will be able to recognize the various operations, processes, techniques and controls presently used in industry.
- b. Student outcomes
 - SO-G. An ability to effectively communicate orally and in writing using the English language.
 - SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice.

Brief List of Topics to be Covered:

- 480 hours of industry exposure (equivalent to 12 weeks)
- Monthly meeting with the faculty adviser

Course Name/Course Code: **Production elective 1 (PRO1LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Anna Siriban Manalang

Textbook and Online Resources:

Hopp, Wallace and Mark L. Spearman, *Factory Physics, Foundation of Manufacturing Management*, Irwin, Inc., 1996
Gibson, P., G. Greenhalgh and R. Kerr, *Manufacturing Management, Principles and Concepts*, Chapman and Hall, 1995.
Krajewski, Lee and Larry P. Ritzaman, *Operations Management, Strategy and Analysis*, Addison-Wesley Publishing Company, 1996.

Course Information:

- a. Description - This course covers advanced concepts in production capacity management, production scheduling and process improvement. It builds on the concepts learned in PRODMA1 and refines them further. These concepts include capacity management, bottleneck dynamics, OPT, operations performance measurement, and human learning applied to production/operations management.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to use relevant information for problem analysis by identifying the right performance measures
 2. The student will be able to use appropriate problem-solving approaches and solution models for solving system problems under study
 3. The student will be able to show integration of all learning from previous courses by utilizing them appropriately in the case studies, assignments
- b. Student outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Dynamic lot sizing: To manufacture or to stock?
- Wagner-Whitin procedure
- Factory Dynamics
- Mass production manufacturing: history, philosophy, evolution.
- Capacity Measurement and Management
- Assembly Line Balancing

- The Corrupting Influence of Variability
- The Effects of Variability in Production plans using Capacity Information.
- Production Dice Game
- Alternative Production flow setups
- Bottleneck dynamics
- Disruptions in Production flow
- Machine setups. Shigeo Shingo's Single-Minute SMED philosophy.
- Wastages: Muda, Mura and Muri
- Lean Manufacturing
- 5S Housekeeping rules
- The Human Element in Operations Management Fear, Burnout, Self-interest, Organizational culture
- Learning curves
- Poka Yoke: Devices that Minimizes mistakes on the shopfloor
- Other TQM approaches to Process Improvement
- Production Performance Measurements.
- Throughput, WIP and Cycle Time
- Push and Pull Production Systems
- Manufacturing information systems: Reports needed by management.
- Trend Investigations, Pareto Analysis
- Eliyahu Goldratt's Optimized Production Technology (OPT)
- Goldratt's factory management concepts.
- Drum-Buffer-Rope method of synchronized manufacturing.
- Aggregate and Workforce Planning
- Product Mix Planning
- Workforce Planning

Course Name/Course Code: **Production Management Elective: Scheduling (PRO2LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Eric Siy

Textbook and Online Resources:

Baker, Kenneth and Triesch, Dan (2009). Principles of Sequencing and Scheduling. New Jersey: John Wiley and Sons.
Baker, Kenneth. (1974). Introduction to Sequencing and Scheduling. NJ: Wiley.
Hillier, Frederick (2011) Introduction to Management Science: a Modeling and Case Studies Approach with Spreadsheets. Boston: McGraw-Hill.
Pinedo, Michael (2012). Scheduling: Theory, Algorithms and Systems. NY: Springer.
Pinedo, Michael and Chao Xiuli (1999). Operations Scheduling with Applications in Manufacturing and Services. Singapore: McGraw-Hill.
Sule, Dileep (2008) Production Planning and Industrial Scheduling: Examples, Case Studies and Applications. Boca Raton, Florida: CRC Press.
Sule, Dileep (1997) Industrial Scheduling. PWS Publishing.

Course Information:

- a. Description - This course covers advanced concepts in production/operations scheduling. It covers the various scheduling techniques and heuristics used in single machines, flowshops, batch, job shops and other production systems. It also includes techniques in manpower scheduling
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to distinguish between the different shop scheduling set ups.
 - 2. The student will be able to discuss the various scheduling objectives such as makespan, flowtime, tardiness, weighted criteria, among others
 - 3. The student will be able to Use computer resources like Microsoft Excel spreadsheet program's Solver add-in to model scheduling problems and interpret computer results to real-world concerns
 - 4. The student will be able to apply specific algorithms and scheduling heuristics for shop scheduling problems presented.
 - 5. The student will be able to generate alternative job sequences or schedules based on stated objective

b. Student outcomes

- SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.
- SO-J. An ability to use the techniques, skills, and engineering tools necessary for engineering and business practice
- SO-K. An ability to perform services in the form of analysis, design, preparation of plans and implementation of production planning and material control systems, manufacturing and service facilities, operations research models for

Brief List of Topics to be Covered:

- Introduction to Scheduling problems, and scheduling criteria
- Review of Dispatching rules
- Single Machine Scheduling
 - Moore, Lawler, Smith algorithms
 - Branch and Bound approach
- Parallel Machine Scheduling
 - Identical machines
 - non-identical machines.
- Batch Scheduling
 - EOQ-type production sequencing
- Flow Shop Scheduling
 - Johnson's Rule (2- and 3- machines)
 - Campbell, Dudek and Smith Algorithm
 - Palmer, Dannenbring Algorithms
 - Ignall-Schrage Algorithm
 - Flowshops with identical parallel machines.
- Job Shop Scheduling using Shifting Bottleneck Heuristic
- Optimized Production Technology (OPT) introductory concepts
- OPT approaches to mass production
- Siy Open Shop Heuristic
- Computer Demonstration: Manpower ILP
- Manpower Scheduling
 - Monroe
 - TPB
 - Manual Shift Scheduling Heuristic

Course Name/Course Code: **Production Management Elective 3 (PRO3LEC)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Dennis Cruz

Textbook and Online Resources:

Coyle, J., Bardi, E., and Langley, C. J. Jr. The Management of Business Logistics: A Supply Chain Perspective. 7th edition. Thomson Learning
Simchi-Levi, Kaminsky, and Simchi-Levi (2000). Designing and Managing the Supply Chain.
Hanfield and Nichols (19992). Introduction to Supply Chain Management
Heizer and Render (2001). Operations Management. 6th edition.
Chopra, Sunil, and Meindl, Peter (2012). Supply Chain Management – Strategy, Planning, and Operations. 5th edition.
Bowersox, Closs, Cooper, and Bowersox (2014). Supply Chain – Logistics Management. 4th edition.
Jacobs, and Chase (2011). Operations and Supply Chain Management. 14th edition.

Course Information:

- a. Description - This course covers concepts in supply chain management.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Elective course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to map out the supply chain network of any focal company whether involve in manufacturing or service.
 2. The student will be able to describe how supply chains can be managed more effectively.
 3. The student will be able to differentiate supply chain structures of different kinds of organizations and industries and for different products or services
 4. The student will be able to illustrate a broad over view of supply chain strategy, development and trends.
 5. The student will be able to integrate the various industrial engineering tools and techniques to recommend solution in improving the performance of a supply chain.
 6. The student will be able to analyze and identify the appropriate performance metrics for a particular supply chain.
- b. Student outcomes
 - SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

SO-K An ability to perform services in the form of analysis, design, preparation of plans and implementation of production planning and material control systems, manufacturing and service facilities, operations research models for

Brief List of Topics to be Covered:

- Introduction to Supply Chain Management Dimensions of Logistics
- Demand Management and Customer Service
- Procurement and Supply Management
- Managing Inventory Flows
- Inventory Decision Making
- Warehousing Decisions
 - Role of Warehousing in Logistics Systems
 - Warehousing Decisions
 - Packaging
- Transportation System
- Logistics Relationship and Third Party
- Logistics and Supply Chain Information Systems
 - Contemporary Issues in Information Systems
 - Architecture and Objectives of Information Systems
 - Modern Drivers of the Connected Economy
 - Contemporary Logistics Information Technologies
 - Adapting to New Information Technologies
- Supply Chain Finance
- Supply Chain Performance Measurement
 - Evolution of Metrics Utilization
 - Performance Categories
 - Supply Chain Metrics
 - SCOR Model
- Green and Sustainable SC, Reverse and Closed Loop SC, Other developments

Course Name/Course Code: **Product Design (PRODSCI)**
Credits and Contact Hours: 1 unit (1-hour lecture)
Instructor: Dr. Alma Maria Jennifer Gutierrez

Textbook and Online Resources:

- Ulrich, K and Eppinger, S. (2012). Product Design and Development, 5th edition. Mc-Graw Hill, USA
- Baxter, M. (1995). Product design: a product guide to systematic methods of new product development. Chapman and Hall, London
- Boothroyd, G. (2005). Assembly Automation and Product Design. Taylor and Francis, Boca Raton, FL, USA.
- Cross, N. (2008). Engineering Design Methods: Strategies for Product Design. Chichester Wiley
- Haskell, B. (2004). Portable Electronics Product Design and Development: for Cellular Phones, PDAs, Digital Cameras. Mc-Graw-Hill, USA.
- Karwowski, W., Soares, M. and Stanton, N. (Eds) (2011). Human Factors and Ergonomics in Consumer Product Design Methods and Techniques. CRC Press Taylor and Francis Group. Boca Raton, FL., USA
- Morris, R. (2009). The Fundamentals of Product Design. Lausanne: AVA
- Shetty, D. (2002). Design for product success. Dearborn, MI. Society of Manufacturing Engineers.
- Bordegoni, M. (2011). Innovation in Product Design From CAD to Virtual Prototyping. Springer, London
- Product Design Forums. Retrieved from <http://www.productdesignforums.com/> Date retrieved: November 7, 2013
- Stanford Design Program Retrieved from <http://designprogram.stanford.edu/> Date retrieved: November 7, 2013
- Design and Emotion. Retrieved from <http://www.designandemotion.org/> Date retrieved: November 7, 2013

Course Information:

- a. Description - This is an introductory course in product design. Lectures include topics on product design framework, product development, quality function deployment, creativity techniques, prototyping, risk, reliability, safety and failure mode and effects analysis, legal and ethical issues in design and intellectual property. The course also relates human limitations to the design of effective products.
- b. Prerequisites/Co-requisites: ERGCOG2 (Soft Pre-requisite), IEMECON (Soft Pre-requisite), LBYME32 , LBYIME31 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will have the ability to conduct critical review on literature about product design theories and methodology.

b. Student outcomes

SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Course overview
- Introduction to Product design
- Product Design Framework
- Identifying customer needs
- Quality function deployment HOQ 1 & 2
- Creativity Technique: Brainstorming, Bionics, Check listing, Idea Diagram
- Prototyping
- Risk, Reliability, and Safety
- Failure Mode and Effects Analysis
- Legal and Ethical Issues in Design
- Intellectual Property

Course Name/Course Code: **Feasibility Study (PROFEAS)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Dr. Anna Bella Siriban Manalang

Textbook and Online Resources:

- National Economic and Development Authority (2000) Reference Manual on Project and Development Manual.
- Jorge H. Cuyugan (2005) A project feasibility study guidebook for Filipino students-- and entrepreneurs. Pampanga : Bright Concepts
- Development Academy of the Philippines. (1978) How to develop project feasibility studies. Sinag-tala Publishers
- Feasibility Study Methods (2012) retrieved from <http://www.method123.com/feasibility-study.php>
- Elements of a Good Feasibility Study (2011) retrieved from http://bestentrepreneur.murdoch.edu.au/Business_Feasibility_Study_Outline.pdf
- Market and Feasibility Studies: a How to Guide (2012) retrieved from <http://pages.uoregon.edu/rgp/PPPM613/downloads/How%20to%20do%20a%20Market%20Analysis.pdf>
- Feasibility Study Elements (2011) retrieved from http://www.umanitoba.ca/afs/agric_economics/MRAC/feasibility.html

Course Information:

- a. Description - The course covers the fundamental tools and technique taken in preparing project feasibility studies. It covers aspects of appraisal (i.e., project cost, market, technical, financial, management organization, social and economic aspects of business ventures and projects). To understand and appreciate the course, actual cases will be given for each module and a final paper on determining the viability of a certain project which involves an actual product shall be required. At the end of the course, the students shall be able to gain an understanding and appreciation of evaluating business opportunities/projects of long term investments, the methods of appraisal as well as their advantage and pitfalls.
- b. Prerequisites/Co-requisites: DEANSYS(Soft Pre-requisite), INDUSMA (Soft Pre-requisite), IEFINMT (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. To devise a feasibility study for a project, particularly of interest to the student which solves an engineering problem.
 2. To evaluate feasibility studies based on learned theories on marketing, technical, management, financial and socio-economic aspects of project implementation.
 3. Engage with the work of the team
 4. Respect the opinions/input of others into decision-making

b. Student outcomes

SO-H. An understanding of the effects of engineering solutions in a comprehensive context.

SO-K. An ability to perform services in the form of analysis, design, preparation of plans, specifications, estimates of work standards, statistical process control systems, production planning and materials control systems, manufacturing and service facilities, operations research models for production and operations, and information systems

SO-D. An ability to work effectively in multi-disciplinary and multi-cultural teams

Brief List of Topics to be Covered:

- Definition of Project and Project Cycle
- Project Cost Estimate, Financial Packaging
- Introduction to Market, Market Forecasting Tools, Industry of Project Analysis
- Appraisal of Project's Market Viability, Estimating Sales Revenues of the Project
- Introduction to Technical Feasibility, Critical Variables in Technical Analysis
- Materials and Equipment Balancing, Production Planning for the time horizon
- Management and Organization, Management Functions, Salary structure design, Benefits design
- Introduction to Financial Analysis, Analysis of Past Financial Statements
- Projecting Financial Statements, Capital Budgeting Decisions
- Taxation Study, Government Priorities
- Economic Analysis
- Feasibility Integration
- Feasibility Assessment

Course Name/Course Code: **Introductory Probability and Statistics
for Industrial Engineering majors (QUAMET1)**
Credits and Contact Hours: 1 unit (1-hour lecture)
Instructor: Eric Siy

Textbook and Online Resources:

- Walpole, R., Myers, R., Myers, S., and Ye, K. (2012). Scientists & Engineers Guide to Probability and Statistics, Ninth Edition. Singapore: Pearson Education South Asia Pte Ltd.
- Mendenhall, William (2013) Introduction to probability and statistics Australia: Brooks/Cole/Cengage Learning
- Douglas C. (2011) Applied statistics and probability for engineers Hoboken, N. J. : Wiley Books.
- Sullivan, M. III. Statistics: Informed Decisions Using Data, 4th Edition (2013) | Pearson Higher Education.
- Shanmugam, Chattamvelli (2015) Ramalingam. Statistics for Scientists and Engineers. Wiley Books.
- Scheaffer, Richard L. (2014) Probability and statistics for engineering students Cengage Learning Asia.
- Khan Academy for Probability and Statistics. Helpful website for supplementary lectures. <https://www.khanacademy.org/math/probability>
- Statistics Education Links. <https://www.causeweb.org/resources/links.php>
- Virtual Laboratories in Probability and Statistics. Helpful applets for demonstrating probability and statistical concepts .<http://www.math.uah.edu/stat/>

Course Information:

- a. Description - This introductory course in probability and statistics covers the basic concepts of probability, random variables, special discrete and continuous probability distributions, concepts of sampling and hypothesis testing using statistics. This course is primarily for Industrial Engineering majors (non-Board courses) and was tailored to fit the CHED-mandated course on Probability and Statistics for engineering graduates.
- b. Prerequisites/Co-requisites: INTECAL (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to identify and describe a random event's sample space and individual components/events of said sample space.
 2. The student will be able to accurately calculate the probability of a specified random event.
 3. The student will be able to determine the mean, median, mode, standard deviation and range of a given data set.
 4. The student will be able to make correct conclusions and interpretation of a statistical hypothesis test.

b. Student outcomes

SO-A An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering.

Brief List of Topics to be Covered:

- Introduction to Probability
- Counting Principles and Techniques Multiplication Rule Addition Rule
- Permutations
- Combinations
- Special Permutation Cases
- Probability Laws
- Conditional Probability
- Baye's Theorem
- Means and Variance/Expectation
- Joint Probability Distribution (Marginal, Conditional, Statistical Independence)
- Laws of Expectation and Variance
- Discrete Probability distribution: Uniform, Binomial, Negative Binomial, Geometric, Hypergeometric, Multinomial, Poisson distributions
- Continuous Probability Distributions: Continuous uniform, Normal Distribution, Exponential
- Frequency Distribution and Descriptive Measures
- Steps in Frequency Construction
- Measure of Variability
- Summarizing data
- Mean, Median, Mode, Range, Standard Deviation
- The Correct Graphs for presenting data
- Hypothesis Testing
- Means, Differences Between Two Means
- Variances, Ratio of Two Variances, Single proportion, Difference Between Two Proportion
- Chi-squared Goodness of Fit Test,
- Test for independence

Course Name/Course Code: **Advanced Quantitative Methods-Lecture (QUAMET2)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor: Bryan Gobaco

Textbook and Online Resources:

Walpole R. E., Myers R. H., Myers S. L. (2007) *Probability and Statistics: For Engineers and Scientists*, 8th Edition. Singapore: Prentice Hall.
Lindeman R. H., Meranda P. F., Gold R. Z. (1980) *Introduction to Bivariate and Multivariate Analysis*. New York: Scott, Foresman and Company.
Hair Jr. J. F., Anderson R. E., Tatham R. L., Black W. C. (2006) *Multivariate Data Analysis*, 6th Edition. Upper Saddle River, New Jersey: Prentice Hall.
Lattin J., Carroll J. D., Green P. E.. (2004) *Analyzing Multivariate Data*. Pacific Grove, CA : Thomson Brooks/Cole.
Johnson R. A., Wichern D. W. (2007) *Applied Multivariate Statistical Analysis*. 6th Edition. Upper Saddle River, New Jersey: Prentice Hall.
Keith T. Z. (2006) *Multiple Regression and Beyond*. USA: Pearson Education
Multivariate Statistics Help, Data Analysis Training and Tutorial Services.
<http://www.researchconsultation.com/multivariate-statistics-analysis-help-training.asp>
Statistics Education Links. <https://www.causeweb.org/resources/links.php>

Course Information:

- a. Description - The first half of the course covers the concepts of univariate and bi-variate non-parametric hypothesis testing, interval estimation and linear regression. The latter half will tackle some analytical tools for dependence and interdependence in a multivariate setting. Specifically, these are: multiple regression, discriminant analysis and canonical correlation analysis.
- b. Prerequisites/Co-requisites: QUAMET1 (Hard Pre-requisite), LBYIMEA
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will have the ability to know when non-parametric hypothesis testing is appropriate and which test should be used.
 2. The student will have the ability to provide the interval estimates for different population parameters.
 3. The student will have the ability to compute for sample sizes for statistical studies.
 4. The student will have the ability to model dependence relationships between variables using regression or discriminant analysis.
 5. The student will have the ability to detect interdependence and evaluate patterns of association among set of variables and effectively reduce number of dimensions to be considered in statistical studies using canonical correlation.

6. The student will have the ability to distinguish between the different statistical techniques and understand or exhibit the interrelatedness or linkages between these.
 7. The student will be able to interpret the statistical results in the context of the data or application that the statistical tool was used for.
 8. The student will have the ability to generate practical insights and/or provide decision-action substantiation from the application of the statistical tools to exam-problem or case-based situations
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering.

Brief List of Topics to be Covered:

- Non-Parametric Tests
- Introduction to Classical Estimation, Estimation Theory
- Linear Regression
- Multiple Regression
- Multiple Discriminant Analysis
- Canonical Correlation

Course Name/Course Code: **Management of Food Service System (RESTOPN)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Dr. Jose Edgar Mutuc

Textbook and Online Resources:

- Payne-Palacio, J. and Theis , M. (2005) *Food Service Management*. (10th Edition). Upper Saddle River, NJ: Prentice-Hall.
- Atienza, Rumel.(2015) *Food Service Management*, :National Bookstore, Manila
- Walker, J. (2014) *The Restaurant*, 7th ed., John Wiley & Sons, New Jersey.
- Barrows, C., Powers, T. and Reynolds, D. (2012), *Management in the Hospitality Industry*, 10th ed., John Wiley & Sons, New Jersey.
- Bitner, M. J., Ostrom, A. L. and Morgan, F. N., (2007) Service Blueprinting: A Practical Technique for Service Innovation. Arizona State University. Retrieved from https://noppa.aalto.fi/noppa/kurssi/tu-22.1335/materiaali/TU-22_1335_bitner_et_al...2008.pdf
- Dutta, K., Parsa, H.G., Parsa, R.A. and Bujicic, M (2014), Change in Consumer Patronage and Willingness to Pay at Different Levels of Service Attributes in Restaurants: A Study in India, *Journal of Quality Assurance in Hospitality & Tourism*, 15:149–174.
- Farhana, N. and Islam, S. (2011) Exploring Consumer Behavior in the Context of the Fast food Industry in Dhaka Industry, *World Journal of Social Sciences*, Vol. 1. No. 1. March 2011. Pp.107- 124
- Office of Food Safety, USDA (2006), *Managing Food Safety*, U.S. Department of Health and Human Services Food and Drug Administration Center for Food Safety and Applied Nutrition, College Park, Maryland.
- Tincher, J. (2012) Creating a Customer-Focused Customer Experience Journey Map. Heart of the Customer. Retrieved from <http://www.heartofthecustomer.com/wp-content/uploads/2013/05/Creating-a-Customer-Focused-Customer-Experience-Map-White-Paper1.pdf>

Course Information:

- a. Description - The course introduces the students to the activities involved in the operation and management of organizations in food service industry, and the different applications of industrial engineering in this industry
- b. Prerequisites/Co-requisites: SERVENG (Co-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to apply the basic knowledge of physical, information, management and social theories and concepts needed in studying and understanding service in food service systems
 2. The student will be able to learn and use concepts and tools in documenting and analyzing service in food service systems using HACCP principles

3. The student will be able to identify customer behavior and needs
4. The student will be able to identify mismatches between customer behavior and needs with the service system of retail store
5. The student will be able to identify alternative ways of delivering service in the food service systems
6. The student will be able to design the improved service system

b. Student outcomes

SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Introduction to Food Service Industry
- The Nature of Food Services
 - Characteristics and peculiarities of Food Services
 - Classifications of food service using service process matrix
- Food Service Quality: Focus on Safety, Cleanliness, Timeliness, and Customer Focus
 - The SERVQUAL Instrument as applied in Food Service
 - Food Safety Inspection System (Hazard Analysis and Critical Point)
 - Food Microbiology
 - Employee Health, Personal Hygiene and Safety
 - General Food Flow Chart
 - Cleaning and Sanitation Facilities
 - Customers of the Food Industry
 - Customer Satisfaction and Protection
 - Methods of Assembly, Delivery and Distribution
- Operational Functions
 - Menu Planning and Writing
 - Demand Management and Operation Planning
 - Purchasing
 - Receiving, Storage and Inventory Control
 - Food Production Scheduling, Control and Evaluation
 - Facility Planning and Design Development
 - Equipment and Furnishing Selection
 - Environmental Management

Course Name/Course Code: **Retail Management for IE (RETMANT)**
Credits and Contact Hours: 2 units (2-hour lecture)
Instructor: Dr. Jose Edgar Mutuc

Textbook and Online Resources:

- Levy, B. and Weitz, B. Retailing management (2014) New York, NY : McGraw-Hill Education
- Berman, B. and Evans, J. (2013). *Retail Management* , 12th edition. New Jersey: Pearson Education
- Fitzsimmons, J. A., Fitzsimmons M. J. (2014). *Service Management: Operations Strategy and Information Technology*, 13th Edition Singapore McGraw Hill.
- Hubner, A. (2011), Category Retail Management, Berlin Springer Verlag
- Lewinson, D. and DeLoizer, M. W. (1986) *Retailing*, 2nd edition, Ohio, Bell and Howell Co.
- Lo, K. P. Y. (2011) Designing Service for Positive Relational Messages. International Journal of Design. University of Loughborough. Retrieved from <http://www.ijdesign.org/ojs/index.php/IJDesign/article/viewFile/898/333>
- Li, C. (2010) A Facility Layout Design Methodology for Retail Environments. Phd Dissertation. University of Pittsburg. Retrieved from ---
- Tincher, J. (2012) Drivers: The Secret to Creating a Great Customer Experience. Heart of the Customer. Retrieved from <http://www.heartofthecustomer.com/wp-content/uploads/2012/02/Drivers-the-Secret-to-a-Great-Customer-Experience-White-Paper.pdf>
- Tincher, J. (2012) ShopperEducation: The Hidden Casualty of Price Wars. Heart of the Customer. Retrieved from <http://www.heartofthecustomer.com/wp-content/uploads/2012/04/Shopper-Education-The-Hidden-Casualty-of-Price-Wars-White-Paper.pdf>
- Tincher, J. (2012) Measuring the Segmented Customer Experience. Heart of the Customer. Retrieved from <http://www.heartofthecustomer.com/wp-content/uploads/2012/01/Measuring-the-Segmented-Customer-Experience-White-Paper.pdf>
- Tincher, J. (2012) Creating a Customer-Focused Customer Experience Journey Map. Heart of the Customer. Retrieved from <http://www.heartofthecustomer.com/wp-content/uploads/2013/05/Creating-a-Customer-Focused-Customer-Experience-Map-White-Paper1.pdf>

Course Information:

- a. Description - Retail management for Industrial Engineers covers a broad overview of the retail operations and introduces the students to the activities in the design and management of retail systems. The course deals with retail strategy, retailing facility and location design, merchandising and inventory management, retail organization, supply chain management and retail information systems
- b. Prerequisites/Co-requisites: SERVENG (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to apply the basic knowledge of physical, information, management and social theories and concepts needed in studying and understanding service in retail systems
 2. The student will be able to learn and use concepts and tools in documenting and analyzing service in retail systems
 3. The student will be able to identify customer behavior and needs
 4. The student will be able to identify mismatches between customer behavior and needs with the service system of retail store
 5. The student will be able to identify alternative ways of delivering service in retail store
 6. The student will be able to design the improved service system
- b. Student outcomes
 - SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Nature of retailing
- Competitive behavior of retail institutions
- Problem of retailing
- Types of retailing
- Buying behaviour of Customers
- Why we buy
- Matching process
- Merchandise management
- Body shop
- Retailing Inventory Management
- Virtual shopping
- Facility design
- Retail location
- Organization

Course Name/Course Code: **Management of Service Operations (SERVENG)**
Credits and Contact Hours: 3 units (3 hour lecture)
Instructor: Richard Li

Textbook and Online Resources:

- Gronroos, C. (2007) *Service Management and Marketing: Customer Management in Service Competition*, 3rd Edition. England. John Wiley & Sons, Ltd.
- Evenson, R. (2012) *Customer Service Management Training 101: Quick and Easy Techniques That Get Great Results*. New York: Amacom
- Cooper, W. (2011) *Handbook on Data Envelopment Analysis*. Boston, MA: Springer U.S.
- Macintyre, M. (2011) *Service Design and Delivery*. Boston, MA: Springer U.S.
- Metters, R., Metters, K., Pullman, M. (2004) *Successful Service Operations Management*. Canada. Thomson South-Western
- Hill, N., Roche, G., Allen, R. (2007). *Customer Satisfaction: The Customer Experience Through the Customer's Eyes*. Cogent Publishing. London
- Johnston, R., Graham, C., Schulver, M. (2012). *Service Operations Management: Improving Service Delivery*, 4th Edition. FT Prentice Hall, Harlow, England
- Zeithaml, V., Bitner, M., Gremler, D. (2008). *Services Marketing*, 5th ed. McGraw Hill. New York

Course Information:

- a. Description - The course introduces the students to the activities involved in the design and management of service systems. The impact and importance of services on a nation's economy is emphasized. Concepts and tools in measuring and achieving service quality are discussed. Moreover, similarities and differences between traditional manufacturing management and service management techniques are tackled.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to identify and recognize service system problems through the use of service classification matrices and related service management tools
 2. The student will be able to solve service-related engineering problems using appropriate tools.
 3. The student will be able to identify and apply the most relevant industrial engineering and management tools in identifying, analyzing, and solving service-related problems.
 4. The student will be able to document case facts and case analysis comprehensively and orally present the use of appropriate tools in addressing the case problem.
 5. The student will be able to use customer-centered measures to find the best possible solution to a service-related problem.

b. Student outcomes

SO-E. An ability to recognize, formulate, and solve engineering problems

SO-G. An ability to effectively communicate orally and in writing using the English language

SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization.

Brief List of Topics to be Covered:

- Introduction to Service Management
- The Nature of Services
- Service Strategy
- Service Quality
- Designing the Service Delivery System
- Managing Waiting Lines
- Queuing Models and Capacity Planning
- Simulation
- Managing Capacity and Demand

Course Name/Course Code: **Introduction to System Dynamics (SYSDYN1)**
Credits and Contact Hours: 1 unit (1-hour lecture)
Instructor: Dennis T. Beng Hui

Textbook and Online Resources:

Business Dynamics by J. Sterman (2001), McGraw Hill
Pruyt, E. (2013), Small System Dynamics Models for Big Issues, TU Delft Library, Delft, Netherlands
Borschev, A (2013), Big Book of Simulation Modeling: Multimethod Modeling with Anylogic 6, AnyLogic North America.
Joklekar, N.R. (2014), Disaggregation of a Stock Variable on Attribute Distribution, International System Dynamics Conference, Delft, Netherlands.
Kapmeier, F., Happach, HM and Tilebein, M (2014), Bathtub Dynamics Revisited: Does Educational Background Matter? , International System Dynamics Conference, Delft, Netherlands.
Kwakkel, J.H., Auping, W.L. and Pruyt, E. (2014), Comparing Behavioural Dynamics Across Models: the Case of Copper, International System Dynamics Conference, Delft, Netherlands.
Puvvala, A., Dutta A., and Roy, R. (2014), Calibrating System Dynamics Models of Technology Diffusion with Structural Breaks: the Case of Android Handsets, International System Dynamics Conference, Delft, Netherlands.
System Dynamics Modelling: A Practical Approach by R.G. Coyle, (1996), Chapman and Hall
The Fifth Discipline by P. Senge, (1990), Currency Doubleday

Course Information:

- a. Description - This course introduces the concepts of system structure, feedback loops, and control systems in relation to the dynamic nature of systems. The emphasis of this course is to understand the principles on how systems behave using archetypes, influence diagrams, and stock and flow diagrams. A mathematical modeling technique will also be introduced to the students, which will be used to model a dynamic system. Principles of how to intervene a system will also be discussed in this course
- b. Prerequisites/Co-requisites: DISCSIM (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will have the ability to identify and understand the meaning of the presence of feedback loops in complex and dynamic systems
 - 2. The student will have the ability to model complex system behavior and identify leverage points
 - 3. The student will have the ability to identify and demonstrate application of system dynamic concepts in a real-world example

b. Student outcomes

SO-H. An understanding of the effects of engineering solutions in a comprehensive context.

Brief List of Topics to be Covered:

- Introduction to System Dynamics
- 11 Laws of Systems Thinking
- Detecting and understanding types of patterns: Common Modes of Behavior
- Causal Loop Diagrams
- Conventions in modeling feedback loops. Causal loop examples
- Understanding and identifying archetypes
- Stock flow diagrams. Levels and Rates. Examples of Stock Flow Diagrams
- Model Principles for formulating dynamo and vensim model
- System dynamics modeling techniques.
 - Modeling complex SD
- 9 Leverage Points

Course Name/Course Code: **Advanced System Dynamics (SYSDYN2)**
Credits and Contact Hours: 1 unit (1-hour lecture)
Instructor: Dr. Jose Edgar Mutuc

Textbook and Online Resources:

- Sterman, J. (a) (2001), *Business Dynamics*, McGraw-Hill.
- Davies, M., Musango, J. and Brent, A. (2014), *A systems approach to understanding the effect of Facebook use on the quality of interpersonal communication*, International System Dynamics Conference, Delft, Netherlands, November.
- Forrester, J. (1961), *Industrial Dynamics*, MIT Press
- Gani, A. and Größler, A. (2014), *Linking brand equity and customer equity: A system dynamics perspective*, International System Dynamics Conference, Delft, Netherlands, November.
- Heffron, P. (2014), *Operationalizing Systems Thinking and System Dynamics Principles, Methods, and Tools in Government Policy and Management*, International System Dynamics Conference, Delft, Netherlands, November.
- Kuipers, J. (2014) *Formal Behaviour Classification under Uncertainty Applying Formal Analysis to System Dynamics*, International System Dynamics Conference, Delft, Netherlands, November.
- Mutuc, J. E. (2014), *Simulating Non-Structural Factors in Disaster Mitigation: The Case of Typhoon Ondoy on the Marikina Watershed*, DLSU Research Congress, De La Salle University, Manila, March.
- Mutuc, J. E. (2012), *Unexpected Dynamics of Simple Improvement Programs: the 5S Case*, International Conference on Asia Pacific Business Innovation and Technology Management, Microtel MOA, Manila, October.
- Pruyt, E., Auping, W., Kwakkel, J. and Thissen, W. (2015), *Better Robustly Right than Accurately Wrong*, International System Dynamics Conference, Cambridge, Massachusetts, USA, July.
- Pruyt, E. (2015), *The Ebola Outbreak in West Africa: Important Lessons about Modeling & Simulating Uncertain Dynamic Issues*, International System Dynamics Conference, Cambridge, Massachusetts, USA, July.
- Pruyt, E. (2014), *System Dynamics and Uncertainty*, International System Dynamics Conference, Delft, Netherlands, November.
- Richardson, G. (1986) *Problems with causal-loop diagrams*, System Dynamics Review, Vol. 2 (no. 2, Summer 1986), pp.158-170.
- Rose, A. (2014), *An Exploration of the System Dynamics Field: a Model-Based Policy Analysis*, International System Dynamics Conference, Delft, Netherlands, November.
- Senge, P. (1990), *The Fifth Discipline*, Currency Doubleday
- Saeed, K. (1999), *Defining a problem or constructing a reference mode*, Social Science and Policy Studies Department, Worcester Polytechnic Institute, Worcester, MA.

Course Information:

- a. Description - This is an advanced course in system dynamics. The course deals with modeling more complex and dynamic systems. These systems not only include manufacturing systems but also broader organizational, economic and social

environments. It highlights decisions and policies of the system that are critical in system behavior.

- b. Prerequisites/Co-requisites: SYSDYN1 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will have the ability to identify a real current industry or societal, economic or environmental problem or concern and building a reference mode and developing causal loop models
 2. The student will have the ability to apply the basic knowledge of mathematical theories and concepts formulating equations and simulating the stock flow diagrams
 3. The student will have the ability to identify, recognize and vary system parameters
 4. The student will have the ability to analyze resulting behavior and relate to feedback loops and/or stock flow
 5. The student will have the ability to identify and simulate policies
 6. The student will have the ability to identify critical decisions and policies that undermine system behaviour from simulation
 7. The student will have the ability to identify conditions, parameters and policies that improve system behaviour from simulation
- b. Student outcomes
 - SO-B. An ability to design and conduct experiments, as well as to analyze and interpret data.
 - SO-H. An understanding of the effects of engineering solutions in a comprehensive context

Brief List of Topics to be Covered:

- Review of System Dynamics
- Advanced reference mode analysis
- Modelling variables and processes
- Decisions and decision making
- Parameters Sensitivity
- Leverage points
- Modelling alternative solutions
- Evaluation alternative solutions

Course Name/Course Code: **PROJECT MANAGEMENT (SYSINDE)**
Credits and Contact Hours: 3 units (3-hour lecture)
Instructor: Ronaldo Polancos

Textbook and Online Resources:

Schwalbe, K. (2014), Information Technology Project Management (7th edition). Cengage Learning Asia
Pinto, J. (2012), Project Management: Achieving Competitive Advantage (3rd edition). Pearson International
Bunin, R.B. (2012), New Perspectives on Microsoft® Project 2010: Introductory (1st Edition). Cengage Learning
Avraham, S., Bard, J., Globerson, S. (2013), Project Management (2nd edition). Pearson International
Gido, J., Clements, J. (2012), Successful Project Management (5th edition). Pearson International
Project Management Book of Knowledge. <http://www.pmi.org/PMBOK-Guide-and-Standards.aspx>

Course Information:

- a. Description - This SYSINDE course develops a foundation of concepts and solutions that supports the planning, scheduling, controlling, resource allocation, and performance measurement activities required for successful completion of a DESIGNING an INFORMATION SYSTEM project. The topics are based on the Project Management Book of Knowledge.
- b. Prerequisites/Co-requisites: PRCIEE1 (Hard Pre-requisite), SYSINFO (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to develop a planning document that will capture the entire project, covering all project phases, from initiation through planning, execution, and closure;
 - 2. The student will be able to perform an earned value analysis using project management software.
- b. Student outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of industrial engineering
 - SO-L. Knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects in a multi-disciplinary environment.

Brief List of Topics to be Covered:

- Introduction to Project Management
- Scope Management
- Time Management
- Cost Management
- Earned Value Management
- Quality Management
- Risk Management
- Communication Management
- Resource Management
- Procurement Management

Course Name/Course Code: **Management Information System (SYSINFO)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Ronaldo Polancos

Textbook and Online Resources:

Satzinger, J. W., Jackson, R. B., Burd, Stephen D. (2014), Introduction to Systems Analysis and Design (6th edition). Cengage Learning Asia
Rosenblatt H. J. (2014), Systems Analysis and Design (10th edition). Cengage Learning Asia
Kendall, K, Kendall, J. (2013), Systems Analysis and Design (9th edition), Pearson International
Valacich, J., George, J., Hoffer, J. (2013), Essentials of Systems Analysis and Design (5th edition). Pearson International
Shelly, G. B., Rosenblatt, H. J. (2012), Systems Analysis and Design (9th edition). Cengage Learning Asia

Course Information:

- a. Description - This course covers the conceptualization, design and development of realistic management information system (MIS) tailored to the specific needs of organizations, whether commercially oriented or not. It shall cover concepts, tools and techniques in the analysis, design and implementation of information systems.
- b. Prerequisites/Co-requisites: DEANSYS (Soft Pre-requisite), LBYIEED (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to document and evaluate existing information system
 2. The student will have the ability to design information system that will enable organization's operational functions to be carried out efficiently and effectively
 3. The student will be able to apply project management principles in project definition, development and monitoring.
- b. Student outcomes
 - SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.
 - SO-K. An ability to perform services in the form of analysis, design, preparation of plans, specifications, estimates, and implementation of: work standards, SPC, production planning and material control systems, manufacturing and service facilities, operations research models for production and operations, and information systems

Brief List of Topics to be Covered:

- Introduction to Systems Analysis and Design
- Analyzing the Business Case
- Project Management
- Requirements Modeling
- Data and Process Modeling
- Process Management
- Object Modeling
- Output and User Interface Design
- Data Design
- Usability Testing

Course Name/Course Code: **Thesis 1 for IEs (THSIEE1)**
Credits and Contact Hours: 1 unit
Instructor: Dr. Charlle Sy

Textbook and Online Resources:

None

Course Information:

- a. Description - This course is the first in a series involving a three-term independent group study, guided by an adviser of their choice and who specializes in the field of their topic.
- b. Prerequisites/Co-requisites: PRCIEN1 (Hard Pre-requisite), MERESIE (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to define and select theoretical or applied engineering problems that could be solved using the concepts, principles, methods, and techniques of Industrial Engineering.
 2. The student will be able to identify opportunities, gaps and direction for improvement for the selected engineering problem
 3. The student will be able to select specific concepts, principles, methods, and techniques of Industrial Engineering that would address the identified opportunities, gaps and direction for improvement for the engineering problem
- b. Student outcomes
SO-E: An ability to recognize, formulate, and solve engineering problems

Brief List of Topics to be Covered:

- Pure Research
 - Introduction/Background of the Study
 - Problem Definition and Objectives
 - Theoretical Framework and Hypotheses
 - Importance of the Study
 - Scope, Limitations and Delimitations
 - Review of Related Studies
 - Methodology and Initial Model / Conceptual Design
 - Reference Documentation
 - Oral Communication
 - Defense of thesis

- Applied Research
 - Company Profile / Background of the Study
 - Industry Profile / Review of Related Literature
 - System Framework and Scope
 - Situation Appraisal
 - Problem Statement and Objectives
 - Reference Documentation
 - Oral Communication
 - Defense of thesis

Course Name/Course Code: **Thesis 2 for IEs (THSIEE2)**
Credits and Contact Hours: 1 unit
Instructor: Dr. Charlle Sy

Textbook and Online Resources:

None

Course Information:

- a. Description - This course is the second in a series involving a three-term independent group study, guided by an adviser of their choice and who specializes in the field of their topic
- b. Prerequisites/Co-requisites: THSIEE1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. The student will be able to analyze the selected theoretical or applied engineering problems using the concepts, principles, methods, and techniques of Industrial Engineering.
 2. The student will be able to identify Industrial Engineering concepts, principles, methods, and techniques that will address the identified issues and concerns of the existing system or process
 3. The student will be able to define specific issues and concerns of the existing system or process for applied engineering problems
 4. The student will be able to analyze the results of the computational tests and/or data obtained from the application of Industrial Engineering concepts, principles, methods, and techniques
- b. Student outcomes
SO-E: An ability to recognize, formulate, and solve engineering problems

Brief List of Topics to be Covered:

- Pure Research
 - Problem Definition and Objectives
 - Literature Review
 - Framework
 - Solution Methodology /Model Formulation
 - Analysis of Data/Results
 - Conclusions and Recommendations based on Initial Set of Solutions
 - Reference documentation

- Applied Research
 - Situation Appraisal
 - System Framework and Scope
 - Problem Statement and Objectives
 - Problem Analysis
 - Analysis of Initial Data or Initial Results
 - Alternative Solutions
 - Reference documentation

Course Name/Course Code: **Thesis 3 for IEs (THSIEE3)**
Credits and Contact Hours: 1 unit
Instructor: Dr. Charlle Sy

Textbook and Online Resources:

None

Course Information:

- a. Description - This course is the third in a series involving a three-term independent group study, guided by an adviser of their choice and who specializes in the field of their topic
- b. Prerequisites/Co-requisites: THSIEE2 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. The student will be able to apply the concepts, principles, methods, and techniques of Industrial Engineering through a directed study.
 - 2. The student will be able to prepare a report that documents the generation of solutions for the identified problem.
 - 3. The student will be able to develop an implementation plan on how the solutions will be rolled out to the system understudy. The plan includes how the team intends the solution to be used and applied by the stakeholders.
 - 4. The student will be able to organize and work in a team: allocate resources, tasks, and responsibilities among team members independent of faculty intervention.
 - 5. The student will be able to demonstrate cohesiveness in the report and presentation.
 - 6. The student will be able to prepare a cost-benefit analysis of proposed solutions
 - 7. The student will be able to discuss foreseeable impacts of proposed solutions; discuss tradeoffs that the system might experience with the application of the proposed solution.
 - 8. The student will be able to prepare, organize, and write project reports acceptable to faculty and mentors from the industry.
 - 9. The student will be able to present and communicate the research problem, analysis, generation of solutions and conclusions to thesis panel members.
 - 10. The student will be able to ensure that identified problems and solutions are new and not lifted from past researches or literature.
 - 11. The student will be able to observe proper citations for ideas, concepts, principles, and conclusions obtained from literature.

b. Student outcomes

- SO-C. An ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints.
- SO-E. An ability to recognize, formulate, and solve engineering problems.
- SO-G. An ability to effectively communicate orally and in writing using the English language
- SO-H. An understanding of the effects of engineering solutions in a comprehensive context.
- SO-F. Recognition of professional, social, and ethical responsibility.

Brief List of Topics to be Covered:

- Pure Research
 - Problem Definition and Objectives
 - Literature Review
 - Framework
 - Solution Methodology /Model Formulation
 - Analysis of Data/Results
 - Conclusions and Recommendations based on Initial Set of Solutions
 - Reference documentation
 - Oral Communication
 - Defense of thesis
- Applied Research
 - Situation Appraisal
 - System Framework and Scope
 - Problem Statement and Objectives
 - Problem Analysis
 - Analysis of Data or Results
 - Conclusions/Recommendations
 - Reference documentation
 - Oral Communication

Course Name/Course Code: **Analytic Geometry (ANAGEOM)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor:

Textbook and Online Resources:

Riddle, Douglas C. (2012). *Analytic Geometry*, 6th Ed. Thomson Brooks/Cole.
Schneider, D, Hornsby, J, Lial, M and Daniels, C (2014). *Trigonometry* 10th Ed, Pearson.
Larson, R (2010) *Trigonometry* 8th Ed, CENGAGE Learning.
Coburn, JW (2008) *Trigonometry*, McGraw-Hill Companies, Inc.
Lial, ML, Hornsby, J. and Schneider, DI (2005) *Trigonometry*, Addison Wesley.
Sullivan, M (2005) *Trigonometry: A Unit Circle Approach*, 7th Ed, Prentice Hall.
Swokowski, EW and Cole, JA (2002) *Algebra and Trigonometry with Analytic Geometry*,
10th Ed, Brooks/Cole

Course Information:

- a. Description - This course provides basic concepts in plane analytic geometry needed by students preparing for calculus courses. The student enrolled in this course should have sufficient background in elementary geometry, algebra and trigonometry. The course specifically covers the fundamental concepts of analytic geometry, different types of equations of lines, equations of the circle, and equations of the conic sections such as parabola, ellipse, and hyperbola. It also deals with the analysis of the properties (i.e., symmetries and asymptotes) of the given equation to approximate the corresponding graphs of simple curves and conics, algebraic curves and polar curves. Students will be challenged by many direct applications in physical situations such as in the case of the conic sections with their important reflective properties, orbits of heavenly bodies, and other types of engineering and scientific applications.
- b. Prerequisites/Co-requisites: ENGALG1 (Hard Pre-requisite), ENGTRIG (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Define and identify the two divisions of Analytic Geometry
 - 2. Distinguish a directed distance from an ordinary distance
 - 3. Use the rectangular coordinate system as a tool in solving problems in Analytic Geometry
 - 4. Determine the relationship between the slopes of parallel line and slopes of perpendicular lines
 - 5. Prove elementary geometric theorems analytically
 - 6. Define and determine the general and the different standard forms of the equations of a straight line.
 - 7. Determine the directed distance from a line to a point.
 - 8. Define, identify the types and state the general parts and properties of a circle and conic section such as parabola, ellipse and hyperbola.

9. Determine the general form and standard forms of the equations of circle, parabola, ellipse, and hyperbola.
10. Solve problems on circles, parabola, ellipse and hyperbola determined by different conditions.
11. Draw neatly and accurately the graphs of circles, parabola, ellipse and hyperbola.
12. Identify the general classification and state the basic properties of the curves and approximate accurately the corresponding graphs of a given algebraic curves as well as polar curves.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of chemical engineering.

Brief List of Topics to be Covered:

- Introduction: Plane Analytic Geometry
- Line
- Circle
- Conic Sections
- Curve Sketching
- Polar Coordinates

Course Name/Course Code: **General Chemistry 1 for COE and CCS
(CHEMONE)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Moore, J.W. and Stanitski, C.L. (2015) Chemistry the Molecular Science (5th edition) Brooks/Cole-Cengage Learning
- Chang, R. (2010) Chemistry, (10th International Edition), New York: McGraw-Hill.
- Kotz, J.C. and Treichel Jr, P.M., Weaver, G.C. (2012) Chemistry and Chemical Reactivity, (8th edition). Australia: Brooks/Cole-Cengage Learning.
- Masterton, W.L. and Hurley, C.N. (2008) Chemistry: Principle and Reactions, (6th edition). Canada: Brooks/Cole- Cengage Learning,
- Malone, L.J., Dolter, T.O. with Gentemann, S. (2013) Basic Chemistry (9th edition) Hoboken, NJ, Wiley.
- Petrucci, R.H. (2011) General Chemistry: Principles and Modern Applications, (10th edition) Toronto: Pearson Canada
- Silberberg, M.S. (2013) Principles of General Chemistry (3rd edition). New York: McGraw-Hill.
- Tro, N.J. with Neu, D. (2012) Chemistry in Focus: A Molecular View of our World, (5th edition). Australia: Brooks/Cole Cengage Learning.
- Zumdahl, S.S., and Zumdahl, S.A. (2012) Chemistry, An Atoms First Approach (International Edition), Brooks/Cole Cengage Learning.

Course Information:

- a. Description – This is a course that covers basic chemical principles that include atomic structure, chemical equations and stoichiometry, periodic table, chemical bonding and molecular structure, gases, liquids, solids and solutions.
- b. Prerequisites/Co-requisites: CHENONE (Equivalent), INOCHE1 (Equivalent), INOCHE1 (Equivalent), PSYCHM1 (Equivalent), PSYCHM1 (Equivalent), NATSCII (Generic)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. At the end of the term, the students are expected to relate chemistry concepts with new developments or current research in their field of study.
- b. Student Outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Orientation
- Chemical Foundations
- Chemical Reactions
- Electron Configurations and the Periodic Table
- Covalent Bonding
- Molecular Structures
- Properties of Gases
- Liquids, Solids and Materials
- The Chemistry of Solutes and Solutions

Course Name/Course Code: **Differential Calculus (DIFFCAL)**
Credits and Contact Hours: 4 units (4 hours lecture)
Instructor:

Textbook and Online Resources:

- Larson, R (2014). Calculus: An Applied Approach, Boston: Houghton Mifflin.
Larson, R and Edwards, B (2014) Calculus. Boston, Massachusetts: Brooks/Cole, CENGAGE Learning.
Stewart, J (2013). Essential Calculus: Early Transcendental, Boston, Massachusetts: Brooks/Cole, CENGAGE Learning.
Smith, RT (2012). Calculus, Boston: McGraw Hill Higher Education.
Stewart, J (2011). Stewart's Calculus Early Transcendentals. Philippine Edition, ISBN-13: 978-981- 4352-83-3.
Hass, J (2009). University Calculus: Elements and Early Transcendentals. Boston: Pearson/Addison Wesley.
Zill, DG (2009). A First Course in Differential Equations with Modeling Applications, CA: Brooks/Cole, CENGAGE Learning.
Stewart, J (2008). Metric International Version Multi-Variable Calculus. Belmont, C. A.: Thomson Brooks/Cole.
Brannan, JR and Boyce, WE (2007). Differential Equations: An Introduction to Modern Methods and Applications, NJ: John Wiley and Sons, Inc.

Course Information:

- a. Description - This course (Differential Calculus - DIFFCAL) includes the basic concepts of calculus such as limits, continuity and differentiability of functions. It aims to develop in the students the skills of differentiation of both algebraic and transcendental functions involving one or more variables. Applications of differential calculus to problems on optimization, rates of change, related rates, tangent and normal lines, and approximations are also discussed. It also includes partial differentiation and transcendental curve tracing specifically logarithmic and exponential functions.
- b. Prerequisites/Co-requisites: ANAGEOM (Co-requisite), ENGCAL1 (Equivalent), ENGALG1 (Hard Pre-requisite), ENGTRIG (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Explain the basic concepts of functions and their limits, and continuous/discontinuous functions.
 2. Define derivatives as a slope of the tangent line and as an instantaneous rate of change.
 3. Differentiate algebraic and transcendental functions with ease.

4. Apply the concept of derivative in the slope of the tangent/normal lines, and find the equation of the tangent/normal lines to a curve.
5. Extend the concept of rate of change to related rates.
6. Apply the concept of differentials to approximations and error problems
7. Define the critical points and points of inflections, and classify the critical point using the first-derivative and second-derivative concepts.
8. Relate the concept of maxima minima to real technical problems.
9. Identify the different indeterminate forms and apply L'Hospital's Rule in evaluating the limit of a function.
10. Analyze and trace correctly the transcendental functions.
11. Perform first-order and higher-order partial derivatives.
12. Apply total differentials to approximation problems.
13. Perform partial differentiation using chain rule.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of chemical engineering.

Brief List of Topics to be Covered:

- Recall the concepts/theories and techniques learned from Algebra and Trigonometry
- Define derivatives as a slope of the tangent line and as an instantaneous rate of change
- Identify the correct derivative formulas to both algebraic and transcendental functions
- Differentiate the slope of the tangent line from that of the normal line.
- Extend the concept of rate of change to related rates.
- Distinguish the derivative from differentials
- Define the critical points and points of inflections
- Solve optimization problems.
- Identify the different indeterminate forms.
- Follow the steps in tracing transcendental functions.
- Define functions with several independent variables.
- Explain total differentials
- Perform partial differentiation using chain rule.
- Perform partial derivatives given implicit functions.

Course Name/Course Code: **Dynamics of Rigid Bodies (DYNAMIC)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor:

Textbook and Online Resources:

Meriam, J.L., and Kraige, L.G. *Engineering Mechanics: Dynamic 7th Edition*. Wiley, 2012. Print.
Bronrdial, Y., and Sy, A. *Principles of Engineering Mechanics: Volume 2 Dynamics*. Springer, 2006. Print.
Beer, F., and Johnston, R. *Vector Mechanics for Engineers Seventh Edition*. McGraw-Hill Education, 2003. Print.
Das, B. *Engineering Mechanics: Dynamics*. Richard D. Irwin, 1994. Print.
Shames, I. *Engineering Mechanics: Statics and Dynamics (4th Edition)*. Prentice Hall, 1996. Print.
Hibbler, R.C. *Engineering Mechanics: Statics and Dynamics (7h Edition)*. Prentice Hall College Div, 1996. Print.
http://www.lboro.ac.uk/faculty/eng/engtlsc/Eng_Mech/tutorials/tut_index.htm

Course Information:

- a. Description - Dynamics of Rigid Bodies is a branch of Engineering Mechanics which deals with the study of forces and their effects on particles and rigid bodies in motion. The course highlights the two branches of dynamics, namely: kinematics and kinetics, as they are applied to the motion of a single particle and extend to describe the motion of a system of particles and rigid bodies. A thorough comprehension of the course constitutes an important component of the basic engineering sciences.
- b. Prerequisites/Co-requisites: MECATWO (Equivalent), STATICS (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. To analyze the motion for particles and rigid bodies, namely: rectilinear translation, curvilinear translation, centroidal rotation, non-centroidal rotation and general plane motion.
 2. Determine the effects of translation on the internal forces in a rigid body.
 3. Formulate the equations of motion and the constraint equations for any rigid body under motion and apply them accordingly to solve dynamics problems.
 4. Determine the effects of rotation on the motion of each particle in a rigid body.
 5. Determine the effects of rotation on the internal forces in each particle in a rigid body.
 6. Determine the effects of combined translation and rotation on the motion and internal forces of each particle in a rigid body.

7. Use energy principles and other alternative methods in solving dynamics problems
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of civil engineering.

Brief List of Topics to be Covered:

- Kinematics of Particles
- Kinetics of Particles
- Kinematics of Rigid Bodies
- Work-Energy Method
- Impulse and Momentum

Course Name/Course Code: **Electrical Engineering Principles (ELENPRI)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Alexander, C. & Sadiku, M. (2009). Fundamentals of Electric Circuits (4th ed.). Boston: McGraw-Hill.
- Hayt, W. & Kemmerly, J. & Durbin, S. (2007). Engineering circuit analysis (7th ed.). Boston: McGraw-Hill.
- Agarwal, A. and Lang, J. (2005). Foundations of Analog and Digital Electronic Circuits. San Mateo, CA: Morgan Kaufmann Publishers, Elsevier.
- Nilsson, J and Riedel S. (2014). Electric Circuits (10th ed.). Prentice Hall.
- Dorf, R. and Svoboda, J. (2010). Introduction to Electric Circuits (8th ed.). Wiley.
- Ashby, D. (2011). Electrical Engineering 101 Everything You Should Have Learned in School ... but Probably Didn't. (3rd ed.). Burlington: Elsevier Science.
- Mayergoyz, I., & Lawson, W. (2012). Basic electric circuit theory a one-semester text. San Diego: Academic Press.
- Dorf, R., & Svoboda, J. (2010). Introduction to electric circuits (8th ed.). Hoboken, NJ: John Wiley & Sons.
- Glisson, T. (2011). Introduction to circuit analysis and design. New York: Springer.
<http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-002-circuits-and-electronics-spring-2007/lecture-notes/>
http://www.ibiblio.org/kuphaldt/electricCircuits/DC/DC_10.html
<http://moodle.cecs.pdx.edu/course/view.php?id=16>

Course Information:

- a. Description - This course covers the fundamentals of both DC and AC circuits intended for non EE/ECE major students. It covers the principles, basic laws and theorems used in analyzing electrical circuits in both direct current (dc) and alternating current (ac) conditions
- b. Prerequisites/Co-requisites: BASICEE (Equivalent), ELECONC (Equivalent), ENGPHY2 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Explain the basic concepts of electrical engineering
 - 2. Reduce resistive networks using reduction techniques
 - 3. Apply circuit analysis techniques and theorems to resistive circuits
 - 4. Compare capacitor and inductor characteristics and formulate electrical equations from circuits involving capacitors and inductors
 - 5. Differentiate DC from AC concepts
 - 6. Apply power analysis and DC circuit theorems and techniques to AC circuits

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Definitions
- Resistance
- Ohm's Law, Electrical Power, Electrical Energy
- Heating Effect of Electric Current
- Connections of Resistors
- Independent/Dependent Sources
- Maximum Power Transfer in DC Circuits
- Cells and Batteries
- Laws, Theorems and Methods Used in Network Analysis
- Inductors
- Capacitors
- Alternating Current Circuits
- Project (Application of Electrical Engineering Concepts)

Course Name/Course Code: **College Algebra for Engineering (ENGALG1)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

Young (2015). Algebra and Trigonometry with WileyPLUS Set. Wiley Custom Edition 3ed. ,NJ: John Wiley and Sons, Inc.
Gustafson, R.D., Hughes, J.D. (2013). College Algebra, Australia : Brooks/Cole Cengage.
Larson, R., Hostetler R.P. (2012). Algebra and Trigonometry, 8th Edition. Cengage Learning Asia Pte Ltd.
Axler, S. J. (2011). College Algebra: with students solution manual. Hoboken, NJ : Wiley.
Parreno, E. B. (2011). College Algebra. MandaluyongCity : Books Atbp.
Stewart, J.,Redlin, L., Watson, S., (2011). Algebra and Trigonometry, 3rd Edition. Cengage Learning.
Sullivan, M. (2011). Algebra and Trigonometry, 9thEdition. Pearson.
Dugopolski, M (2010). Algebra for College Students. 4th ed., Boston, Mass. : McGraw-Hill Higher Education.
<http://www.wolframalpha.com>

Course Information:

- a. Description - The course seeks to develop the student’s skills in manipulating algebraic expressions and equations; then develop an analytical mind in applying such skills in solving word problems. Acquisition of skills involves operations and simplification of algebraic expressions, functions, inequalities and equations. It also includes determination of the solution sets of different types of algebraic equations in one variable, such as linear, quadratic, polynomial of degree n, fractional, radical equations and quadratic in form, as well as those of transcendental functions such as exponential and logarithmic equations. Lastly, it includes finding solution sets of systems of linear equations involving up to 3 variables, and systems involving quadratics, by the elimination methods.
- b. Prerequisites/Co-requisites: None
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Operate and simplify algebraic expressions then use manipulative and analytical skills to solve word problems.
 - 2. Express thoughts clearly and orderly, both verbally and in writing, in solving problems correctly.
 - 3. Apply analytical solutions to real life problems.
 - 4. Develop a sense of responsibility in fulfilling assigned tasks.
 - 5. Solve problems correctly within specifies time limit.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- The Set of Real Numbers
- Rational Expressions
- Algebraic Equations in One Variable
- Inequalities
- Functions
- Systems of Linear Equations involving up to three Variables
- Systems involving Quadratic Equations

Course Name/Course Code: **Advanced Algebra for Engineering (ENGALG2)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor:

Textbook and Online Resources:

- Young (2015). Algebra and Trigonometry with WileyPLUS Set. Wiley Custom Edition 3ed. ,NJ: John Wiley and Sons, Inc.
- Gustafson, R.D., Hughes, J.D. (2013). College Algebra, Australia : Brooks/Cole Cengage.
- Larson, R., Hostetler R.P. (2012). Algebra and Trigonometry, 8th Edition. Cengage Learning Asia Pte Ltd.
- Axler, S. J. (2011). College Algebra: with students solution manual. Hoboken, NJ : Wiley.
- Parreno, E. B. (2011). College Algebra. MandaluyongCity : Books Atbp.
- Stewart, J., Redlin, L., Watson, S., (2011). Algebra and Trigonometry, 3rd Edition. Cengage Learning.
- Sullivan, M. (2011). Algebra and Trigonometry, 9th Edition. Pearson.
- Dugopolski, M (2010). Algebra for College Students. 4th ed., Boston, Mass. : McGraw-Hill Higher Education.

Course Information:

- a. Description - This course (ENGALG2, Advanced Algebra) provides the continuation of concepts in ENGALG1 in order for the students to have a working knowledge of college-level algebra and its application to engineering. Emphasis is placed upon on the decomposition of rational expressions into partial fractions, matrix algebra and its application in solving system of linear equations, and an introduction to combinatorics. Students will be challenged by new concepts and their application to word problems that require them the analytical skills to find the ratio, proportion and variation, to determine the element and sum of elements in an arithmetic or geometric sequence, as well as, to apply the fundamental principles of counting, permutation and combination. The students will also develop the skills to understand and apply the principles of mathematical induction and binomial theorem.
- b. Prerequisites/Co-requisites: ENGALG1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Manipulate and decompose rational expressions into simpler partial fractions.
 2. Analyze, translate and solve problems containing ratio, proportion and variation.
 3. Understand the concept and basic operations involving matrices and apply them in problems concerning systems of linear equations.
 4. Apply the concepts of sequences and series in solving word problems and finding unknown terms.
 5. Apply the principles of mathematical induction in proving general statements about natural numbers.

6. Develop skills in the fundamental principles of counting, permutations, combinations and the binomial theorem and be able to apply them in solving problems.
 7. Apply analytical solutions to solve problems correctly within specified time limit.
 8. Develop a sense of responsibility and academic honesty in fulfilling assigned tasks.
 9. Develop inter-personal skills in exchanging ideas with confidence and work harmoniously with other students in the class.
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Partial Fractions
- Ratio, Proportion and Variation
- Matrix Algebra
- Sequence and Series
- Counting Principles
- Binomial Theorem

Course Name/Course Code: **Differential Equations (ENGIANA)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

Zill, D. G., Wright, W. S. and Cullen, M. R. (2013). Differential Equations with Boundary-Value Problems, 8th Edition, International Edition. China: Brooks/Cole, CengageLearning. (Note: states only D. G. Zill and W. S. Wright on cover and preface.)
Ayres, Frank. Jr. Theory and Problems of Differential Equation. Schaum's Outline Series.
Brannan, J. R. and Boyce, W. E. (2007). Differential Equations: An Introduction to Modern Methods and Applications, NJ: John Wiley and Sons, Inc.
Boyce, W. E. and DiPrima, R. C. (2012), Elementary Differential Equations, 10th Edition, NJ: John Wiley and Sons, Inc.
<http://www.wolframalpha.com>
<http://www.academicearth.org/courses/differential-equations>

Course Information:

- a. Description - This course is intended for all engineering students to have a firm foundation on differential equations in preparation for their degree-specific advanced mathematics courses. It covers first order differential equations, nth order linear differential equations and systems of first order linear differential equations. It also introduces the concept of Laplace Transforms in solving differential equations. The students are expected to be able to recognize different kinds of differential equations, determine the existence and uniqueness of solution, select the appropriate methods of solution and interpret the obtained solution. Students are also expected to relate differential equations to various practical engineering and scientific problems as well as employ computer technology in solving and verifying solutions.
- b. Prerequisites/Co-requisites: INTECAL (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Identify differential equations based on their types, existence and uniqueness of solutions
 - 2. Select and execute appropriate methods of solution to a given differential equation or problem
 - 3. Articulate verbally, clearly explain and justify the solution to differential equations and their applications
 - 4. Present neatly and in an organized way the written solution to differential equations and their applications
 - 5. Recognize actual and practical engineering situations where differential equations can be applied

6. Utilize differential equations and their solutions to applications discussed in, but not limited to, those covered in class
7. Discern, critique and interpret obtained solutions to differential equations
8. Practice the value of honesty and responsibility in fulfilling assigned tasks
9. Work with a small team to formulate and solve a problem involving applications of differential equations and present the solution in a short video

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Introduction / Definition
- Solution of some 1st order DE
- Introduction to Use of Computer in Solving Differential Equations
- Application of 1st Order Differential Equations
- Linear Differential Equation of Order
- Laplace Transforms of Functions
- The Heaviside Unit-Step Function
- Application of Laplace Transforms(Problems on Vibration)
- Solution of Systems of Linear Differential Equation with Initial Values / Simultaneous Solution to DE (Laplace Transform Method)

Course Name/Course Code: **Basic Communication and Study Skills (ENGLCOM)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- McWhorter, K. T. (2005). Guide to college reading (7th ed.). New York: Longman.
- OWL Purdue Online Writing Lab. (2013). APA style. Retrieved from <http://owl.english.purdue.edu/owl/resource>
- Potter, W. J. (2011). Media literacy (5th ed.). California: Sage Publications, Inc.
- Rawlins, J., & Metzger, S. (2012). The writer's way. Australia: Wadsworth/Cengage Learning.
- Reid, J. (2006). Essentials of teaching academic writing. Boston, MA: Thomson/Heinle.
- Reinking, J., & von der Osten, R. (2009). Strategies for Successful Writing: A Rhetoric, Research Guide, and Reader (9th ed.). New Jersey: Prentice Hall.
- The Writing Center of the University of Wisconsin Madison. (2012, July 2). The writer's handbook: APA documentation guide. Retrieved from <http://writing.wisc.edu/Handbook/DocAPA.html>
- VanderMey, R. et al. (2012). The college writer: A guide to thinking, writing, and researching. Australia: Cengage Learning.
- Wilson, P., & Glazier, T.F. (2012). The least you should know about English: Writing skills form A. Boston, MA: Wadsworth/Cengage Learning.

Course Information:

- a. Description - This course (ENGLCOM or ENGLISH COMMUNICATION) is a foundational course that equips freshman students with the necessary academic reading and writing skills needed to become multi-literate and autonomous learners, and engaged citizens in the 21st century. ENGLCOM is the first GE English course in the students' curriculum that is anchored on transformative as well as self-directed learning frameworks.
- b. Prerequisites/Co-requisites: COMART1 (Equivalent), ENGLONE (Equivalent)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Write an extended definition essay on a relevant topic.
 2. Write a problem-solution/claim-counterclaim essay on any cultural or social issue.
 3. Organize/prepare an e-portfolio that showcases student's best works.
 4. Prepare a media/reading log of articles read in various forms of media.
- b. Student outcomes

SO-E. An ability to recognize, formulate, and solve problems
SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Orientation
- Introduction to Academic Reading and Academic Writing
- Basic Reading Skills
- Advanced Reading Skills
- Fundamentals of Writing
- Note-taking Skills
- Organizing a paragraph/an Essay
- Extended Definition
- Argumentative / Problem-Solution Essay
- E-portfolio

Course Name/Course Code: **English for Research (ENGLRES)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- American Psychological Association [APA]. (2013). APA style. Retrieved www.apastyle.org
- Arkin, M. & Macheski, C. (2006). Research papers: A guide and workbook. Boston, MA: Houghton Mifflin.
- Hervas, L.C. (2005). Writing a research paper the right way: With easy-to-follow strategies. Quezon City: New Day Publishers.
- Howard, R.M. (2010). Writing matters: A handbook for writing and research. New York: McGraw Hill.
- Neville, C. (2007). The complete guide to referencing and avoiding plagiarism. Maidenhead: McGraw Hill/Open University Press.
- The Purdue Online Writing Lab [OWL]. (2013). General format: General APA guidelines. Retrieved www.owl.english.purdue.edu

Course Information:

- a. Description - This course is an English for Academic Purposes (EAP) course that aims to teach students to apply reading and writing skills necessary in conducting research. It also enhances the critical thinking skills required in academic research writing/communication of a particular field (Business, Computer Science, Liberal Arts, Education, Science, and Engineering).
- b. Prerequisites/Co-requisites: COMART2 (Equivalent), ENCOMP1 (Equivalent), ENGLART (Equivalent), ENGLTWO (Equivalent), ENGLCOM (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Compose writing outputs which adhere to the rudiments of academic writing.
 2. Read critically specialized texts by: identifying audience, message, and purpose; determining and evaluating the author's claims and arguments by asking critical questions; and interpreting graphic and electronic information.
 3. Develop rational and well-structured arguments/details based on a logical interpretation of reliable sources.
 4. Write a comprehensive and detailed annotated bibliography and be able to justify the sources included and argue by providing description of each.
 5. Integrate in the research paper both primary and secondary sources for a comprehensive literature review in support to the topic. Write and present a research paper on the approved topic.
 6. Write and present a research paper on the approved topic.
 7. Always exhibit intellectual honesty by acknowledging sources using the latest documentation style;

8. Address identified problems/issue in the community/respective fields by writing a research paper.
9. Work on topics that are related to one's field in order to improve oneself for the progress of community/society.
10. Upgrade the research output for a larger research project that may involve other people in the same field or expertise

b. Student outcomes

SO-E. An ability to recognize, formulate, and solve problems

SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Syllabus and Course Introduction
- Research topics
- Sources
- Annotated bibliography
- Thesis statement and Outline
- Survey / Interview / Non-prose
- Direct quotes, paraphrasing and summarizing
- Note-taking and in-text citation
- Research paper draft
- Introduction, conclusion, title, format
- Final Paper

Course Name/Course Code: **Physics Fundamentals for Engineering 1 (ENGPHY1)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

Young, H. and Freedman, R. (2016). University physics (14th edition). New York: Addison-Wesley Publishing Company
Halliday, D., Resnick, R. and Walker J. (2014). Fundamentals of physics (10th edition). New York: John Wiley and Sons.
Serway, R. and Jewett, J. (2014), Physics for scientists and engineers with modern physics (9th edition). Chicago: Saunders College Publishing.
Cutnell, J., Johnson, K., Young, D. and Stadler, S. (2015). Physics (10th edition) Wiley and Sons.
Giambattista, A., Richardson, B. and Richardson, R. (2016). Physics (3rd Edition) McGraw Hill.

Course Information:

- a. Description - This is a General Education (GE) course on Physics designed for students in the College of Engineering (COE). This course is a study of the conceptual foundations of Newtonian mechanics, fluids, and heat. In examining Newton's three laws of motion and their relevant consequences, vector methods as well as the basic concepts of calculus will be used
- b. Prerequisites/Co-requisites: PHYENG1 (Equivalent), PHYFUN1 (Equivalent), ENGCAL1 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Infer and predict relevant consequences and apply the laws and principles in solving physics problems.
 - 2. Interpret and explain the solutions in a clear and organized manner.
 - 3. Apply the basic physical laws and principles of physics in the relation to its environment and everyday living.
 - 4. Volunteer and share the knowledge in physics for the under-privileged
- b. Student outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Vectors
- Kinematics
- Dynamics
- Work, Energy and Power
- Impulse and Momentum
- Rotation
- Dynamics of Rotation
- Fluids
- Heat
- Field trip, Museum Visit, Science Center, Physics Camp, Outreach project in physics, and other activities required by the course

Course Name/Course Code: **Physics Fundamentals for Engineering 2
(ENGPHY2)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

Young, H. and Freedman, R. (2016). University physics (14th edition). New York: Addison-Wesley Publishing Company
Halliday, D., Resnick, R: and Walker J. (2014). Fundamentals of physics (10th edition). New York: John Wiley and Sons.
Serway, R. and Jewett, J. (2014), Physics for scientists and engineers with modern physics (9th edition). Chicago: Saunders College Publishing.
Cutnell, J., Johnson, K., Young, D. and Stadler, S. (2015). Physics (10th edition) Wiley Sons.
Giambattista, A., Richardson, B. and Richardson, R. (2016). Physics (3rd Edition) McGraw Hill.
"Physlet physics: interactive illustrations, explorations, and problems for introductory physics" by Christian, Wolfgang. Upper Saddle River, N.J.: Prentice Hall, Pearson Education, c2004. Location: Circulation, 3rdFlr. QC30 .C47 2004; CD02355
Physlets at Boston University, <http://physics.bu.edu/~duffy/classroom.html>. Mechanics and Heat are in the first semester set. Electricity & magnetism is in the second semester set.
MIT OpenCourseWare – Physics, <https://ocw.mit.edu/courses/find-by-topic/#cat=science&subcat=physics>
<http://ivle.dlsu.edu.ph/workspace/>
www.phet.colorado.edu
<http://webphysics.davidson.edu/applets/applets.html>

Course Information:

- a. Description - This is a General Education (GE) course on Physics designed for students in the College of Engineering (COE) and College of Science (COS). This is a study on the fundamental concepts of Electricity and Magnetism. It deals with Elasticity, Oscillation and Waves, Coulomb's Law, Electric Field, Gauss' Law, Electric Potential, Capacitance, Current and Resistance, Circuits, Magnetic Field, Ampere's Law, Faraday's Law of Induction, Maxwell's Equations, Electromagnetic Waves, and Optics. In examining the concepts mentioned and its relevant consequences, vector methods, as well as the basic of calculus will be used
- b. Prerequisites/Co-requisites: PHYENG2 (Equivalent) ENGPHY1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Infer and predict relevant consequences and apply the laws and principles in solving physics problems.

2. Interpret and explain the solutions in a clear and organized manner.
 3. Apply the basic physical laws and principles of physics in the relation to its environment and everyday living.
 4. Volunteer and share the knowledge in physics for the under-privileged
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Elasticity, Oscillations, and Waves
- Electric Fields
- Gauss's Law
- Electric Potential
- Capacitance and Dielectrics
- Current, Resistance, and Electromotive Force
- Direct-Current Circuits,
- Magnetic Fields and its Sources
- Faraday's Law, Inductance, Alternating Circuit,
- Electromagnetic Waves, Optics
- Field trip, Museum Visit, Science Center, Physics Camp, Outreach project in physics, and other activities required by the course

Course Name/Course Code: **Plane and Spherical Trigonometry for Engineering (ENGTRIG)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

Young (2015). Algebra and Trigonometry with WileyPLUS Set. Wiley Custom Edition 3rd ed., NJ: John Wiley and Sons, Inc.

Rider, P.R. (1971). Plane and Spherical Trigonometry, The Macmillan Company.

M. L., Hornsby, J., Schneider, D. I., Daniels, C. J. (2013). Trigonometry, 10th ed. Boston : Pearson

Larson, R. E. (2012). Trigonometry, 9th ed., Boston, MA : Brooks Cole, Cengage Learning.

Larson, R., Hostetler R.P. (2012). Algebra and Trigonometry, 8th ed. Cengage Learning Asia Pte Ltd.

Dugopolski, M. (2011). Trigonometry, 3rd ed. Boston : Addison Wesley.

Stewart, J., Redlin, L., Watson, S., (2011). Algebra and Trigonometry, 3rd Edition. Cengage Learning.

Sullivan, M. (2011). Algebra and Trigonometry, 9th Edition. Pearson.
<http://www.wolframalpha.com>

Course Information:

- a. Description - This course (Plane and Spherical Trigonometry) consists of two parts: plane and spherical trigonometry. Plane trigonometry covers the discussion of angles and how they are measured, trigonometric expressions and functions. The trigonometric functions are defined using the ratio of the sides of right triangle, the unit circle and the position of a point in the Cartesian plane. After extending the domain of the trigonometric functions to arbitrary angles and real numbers, the graphs and graphing techniques are executed.

Concepts in analytical trigonometry include trigonometric identities and equations as well as the inverse trigonometric functions. Computational skills in manipulating trigonometric expressions and equations are enhanced by solving problems on solutions of right triangles and solving problems involving oblique triangles using the Law of Sines and Cosines. In addition, trigonometric forms of complex numbers are also included. Lastly, Spherical Trigonometry covers the fundamental formulas and the solution of spherical triangles.

- b. Prerequisites/Co-requisites: ENGALG1 (Co-requisite)
c. Required course

Specific Goals for the Course:

- a. Specific outcomes
1. Understands the concepts of angle and its measurements.
 2. Define trigonometric functions using the ratio of the sides of right triangle, the position of a point in the Cartesian plane and the unit circle.
 3. Draw the graph of the different trigonometric functions.

4. Verify and apply analytical trigonometry concepts such as identities, inverse trigonometric function in solving trigonometric equation.
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of chemical engineering.

Brief List of Topics to be Covered:

- Introduction to Trigonometry
- Trigonometric Function
- Graphs of Trigonometric Function
- Trigonometric Identities
- Inverse Trigonometric Functions and their applications
- Trigonometric Equations
- Applications of Trigonometry
- Spherical Trigonometry

Course Name/Course Code: **Pagbasa at Pagsulat sa Ibat-ibang Disiplina (FILDAR)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Batnag, Aurora at Lilia Antonio. *Pagsasalin: Teorya at Praktika*. Quezon City: C&E Publishing, Inc. 2009. Print
- Sibayan, Bonifacio P. *The Intellectualization of Filipino and Other Essays on Education and Sociolinguistics*. Manila: De La Salle University Press Inc. 2003. Print.
- Constantino, Pamela C. “Mga Babasahin sa Varayti at Varyasyon na Filipino.” *Minanga*. Quezon City: University of the Philippines Press, 2003. Print.
- Malay. “Muling Pagtingin sa Ortograpiyang Filipino: Karanasang DLSU.” *Malay*. Tomo 22, Bilang 1 (2009): 45-49. Print.
- Paz, Vina P. “*Ang Pang-akademiyang Varayti ng Wika sa Pilipinas*” *Minanga*. Quezon City, University of the Philippines Press, 2003. Print.
- Santos, Benilda S. *Ang Wikang Filipino sa Loob at Labas ng Akademya’t Bansa (Unang Sourcebook ng SANGFIL)*. Diliman, Quezon City, University of the Philippines Press. 2003. Print.
- Sison-Buban, Raquel E. “Saling Abueg: Ang Pagtatagpo ng Ideya at Praktika ng Pagsasalin.” *Malay*. Tomo 24, Bilang 1 (2011): 93-103. Print.
- Tullao, Tereso S. “Ekonomiks sa Diwang Pilipino: Halo-Halo, Tingi-Tingi at Sari-Sari.” *Malay*. Tomo 22, Bilang 1 (2009): 101-112. Print.
- Zafra, Galileo. Ed. *Mga teksto mula sa Salin-suri: Panimulang Pagmamapa ng mga Larangan ng Pag-aaral ng Pagsasalin sa Filipinas (Ikatlong Sourcebook ng SANGFIL)*. Diliman, Quezon City, University of the Philippines Press. 2009. Print.
- Africa, Sonny. “Ang EDSA at ang Ekonomya: 25 taon pagkalipas.” *IBON Features*. 2011. Web. 23 May 2011. <http://www.ibon.org/ibon_features.php?id=134>
- De La Salle University. “Natatanging Isyu sa Wika.” *Malay* 22.1 (2009). Web. 23 May 2011. <<http://www.philjol.info/philjol/index.php/MALAY>>
- Masakayan, Nicolo. “Ilang mga Hamon sa Pamilyang Filipino sa Panahon ng Internet.” *Malay* 23.1 (2010). Web. 23 May 2011. <<http://www.ejournals.ph/index.php?journal=malay&page=article&op=view&path%5B%5D=1577>>
- San Juan, David Michael. “Multilingwalismo: Salbabida ng Wikang Filipino at Mga Dayalekto, Bagong Kahingian ng Globalisadong Mundo.” 2008. Web. 23 May 2011. <<http://www.scribd.com/doc/56032425>>

Course Information:

- a. Description - Ang kursong FILDAR (Filipino: Pagbasa at Pagsulat sa Iba’t Ibang Disiplina at Larangan) ay nakapokus sa paglinang ng mga kasanayan sa analitikal at kritikal na pagbasa at pagsulat para sa pangangailangang akademik at komunikasyong pampropesyunal na nagsasaalang-alang sa iba’t ibang register ng wika. Pag-aaralan ang mga teknik sa pagsasalin, at estratehiya sa pagbasa na lampas sa komprehensyong literal gamit ang mga genre na nakasulat (maging naririnig/napapanood) na tekstong disiplinang o buha’t sa iba’t ibang larangan ng gamit ng wika – humanidades, agham

panlipunan at komunikasyon, at agham at teknolohiya, at propesyon. Magsisilbing modelo ang mga babasahin sa pagsulat ng mga iskolarling sanaysay at riserts.

- b. Prerequisites/Co-requisites: FILPI2 (Equivalent) FILKOMU (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Nakapagsasalin ng mga makabuluhang texto sa iba't ibang larangan mula Ingles tungong Filipino bilang ambag sa intelektwalisasyon ng wikang pambansa.
 2. Nakasusulat ng iskolarli at masining na sulatin o nakalilikha ng video research sa iba't ibang disiplina na nagsasaalang-alang ng wastong gamit ng wika, kritikal at malikhaing pag-iisip, na nag-aambag sa pagbuo ng isang intelektwalisadong wikang Filipino.
- b. Student outcomes
 - SO-E. An ability to recognize, formulate, and solve problems
 - SO-G. An ability to effectively communicate orally and in writing using the Filipino language

Brief List of Topics to be Covered:

- Fundasyon ng pagpapahayag- akademik
- Wika at ang Wika sa Akademya “Ang Wikang Filipino sa Akademya”
- Intelektwalisasyon ng Filipino
- Pagsasalin at Pagpapayaman ng *Register*
- Pagbuo ng Riserts /Term Paper para sa Larangan / Disiplina
- Ang Documentary Films Bilang Riserts
- Pagpapayaman ng Bokabularyo sa mga Disiplina
- Pagsasalin: Simulain, Proseso, Kritiking ng Pagsasalin, at Worksyap
- Imersyon sa Disiplinang Inhenyeriya
- Imersyon sa Ekonomiks
- Imersyon sa Agham Panlipunan
- Presentasyon ng Riserts

Course Name/Course Code: **Komunikasyon sa Filipinohiya (FILKOMU)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Bocobo, Jorge. *Maling Edukasyon sa Filipino*. Print.
- Cruz, Isagani.. *Wika sa Edukasyon: Hanggang Salita Lamang Seryeng panayam sa Filipinohiya. Di panalilimbag na papel*. Departamento ng Filipino, Pamantasang De La Salle-Maynila, 2003. Print.
- Garcia, Fanny A. *Pamilya Migrasyon Disintegrasyon*. 2012. Quezon City: C&E Publishing, Inc.
- Madula, Rowell D. www.ang_espasyong_bakla_sa_cyberspace.com: [Isang Pagsususri ng Diskurso ng Usapang Bakla sa mga Chatroom](#). Malay.Tomo 22, Bilang 2 (2010): 85-98. Print.
- Mangahis, Josefina, Rhoderick V. Nuncio at Corazon M. Javillo.. *Komunikasyon sa Akademikong Filipino*. Quezon City: C&E Publications, 2005. Print.
- Mendoza, Jing Panganiban. *Carlos Palanca Memorial Awards. Second Prize for the Essay in Filipino*. 2004
- Nuncio, Elizabeth Morales. *Ang Syudad ng Mall: Ang Bakod, Bukod, at Buklod bilang Espasyo at Biswal mula Tabuan hanggang SM City North EDSA*. Manila: De La Salle University Publishing House. 2012
- Tauro-Batuigas, Janet at Ernesto Carandang. *Bin-i: Critical and New Theoretical Writings on Philippine Studies*. Manila: UST Publishing House, 2004. Print.
- Tolentino, Rolando B. *Kulturang Popular Aklat 5: Paghahanap ng Virtual na Identidad*. Pasig City: Anvil Publishing, Inc., 2004. Print.
- Torres-Yu,Rosario. *Tungo sa Pagbuo ng Filipinong Diskursong Pangkalinangan. Filipino at Pagplaplanong Pangwika*. Ikalawang Sourcebook ng Sangfil. Print.
- Tullao, Tereso. *May Papel ba ang Wikang Filipino sa Globalisasyon? Seryeng panayam sa Filipinohiya. Di pa nalilimbag na papel*. Departamento ng Filipino, Pamantasang De La Salle-Maynila, 2003. Print.
- IBON Foundation, Inc. *Misedukasyon*. IBON Video Production Unit, 2001. Video Documentary.
- UP Sentro ng Wikang Filipino. *Gabay sa Editing sa Wikang Filipino*, 2004.

Course Information:

- a. Description - Ang kursong FILKOMU o Komunikasyon sa Filipinohiya ay nakapokus sa paggamit ng wika sa higit na mataas na antas sa limang makrong kasanayan sa pagtalakay ng Araling Pilipinas (Philippine Studies) sa pagkilala at pag-unawa sa sarili at sa pambansang identidad, kultura, at lipunan. Pangkalahatang saklaw ng kurso ang pagtatamo ng bawat Lasalyanong estudyante ng kompetens sa komunikasyon sa limang diskors na may kontent ng Filipinohiya sa larangang akademik.
- b. Prerequisites/Co-requisites: FILIPI1 (Equivalent)
- c. Required course

Specific Goals for the Course:

a. Specific outcomes

1. Nakapagsasagawa ng kolaboratibong pananaliksik o video research batay sa kursong kinukuha, makabagong kaalaman at iba pang disiplina o larangan nang may katapatan at tumatalakay sa mga isyung panlipunan.
2. Nakapag-oorganisa ng isang lektyur-forum na naglalahad ng papel-pananaliksik sa iba't ibang larangan ng buhay-bansa at/o kalagayang pandaigdigang tungo sa pagpapalawak ng kaalaman, karanasan, at kamalayang Filipino.

b. Student outcomes

SO-E. An ability to recognize, formulate, and solve problems

SO-G. An ability to effectively communicate orally and in writing using the Filipino language

Brief List of Topics to be Covered:

- Oryentasyon sa Filkomu Ang Filipino sa kolehiyo Batayang Kaalaman sa Komunikasyon at Wika Pagsulat ng Reaksyon/Repleksyon Kasaysayan Kahulugan, Isyu at Anyo ng Filipino Kasaysayan at Ebolusyon ng Wikan Filipino (Tagalog, Pilipino, Filipino) Pagahahambing at Pagsusuri ng Sampling
- Ang Filipinolohiya
- Ang Papel ng Wika sa Edukasyon at Lipunan
- Ang Bukal at Kahulugan ng Pilipinong Identidad sa Loob ng Pilipinas
- Pilipinong Identidad sa Labas ng Pilipinas/Diaspora
- Pag-organisa ng Lektyur- Forum
- Pag-unawa sa kulturang popular
- Diskors ng kasarian

Course Name/Course Code: **Fitness and Wellness (FITWELL)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor: Dr. Janet S. Mariano

Textbook and Online Resources:

- [John Term]. (2012, December 12). *Jennifer Lopez - Dance Again - Hi - Low Aerobic Choreography - Back 2 Basics - 11/12/2012*. [Video File]. Retrieved from <https://www.youtube.com/watch?v=zU7qNaFQBuU>
- [The Fitness Marshall]. (2014, December 15). *Twerk It Like Miley - The Fitness Marshall - Cardio Concert* [Video File]. Retrieved from <https://www.youtube.com/watch?v=Eq1ovSOz80o>
- [Tina D'Great]. (2016, June 23). *Tatlong bibe zumba dance. By Paul Nunez* [Video File]. Retrieved from <https://www.youtube.com/watch?v=lZ658XzKzg0>

Course Information:

- a. Description - The course focuses student learning on health-related fitness specifically cardio-respiratory endurance. Students will learn basic dance aerobics vocabulary/skills and choreographed dance routines. It will also provide information the student needs to understand, plan, and create physical fitness program that features dance aerobics as a primary activity.
- b. Prerequisites/Co-requisites: None
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Explain phases of aero routine
 2. Identify basic aero dance vocabulary
 3. Increase movement coordination and rhythmic awareness
 4. Combine basic aero movements and personal style to create group aero routine
 5. Set personal fitness goals and evaluate personal progress
- b. Student outcomes

SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be covered:

- Orientation
- Department Policies
- Course requirements
- Class Policies
- Introductory Lesson on creating basic dance aero

- Benefits of cardio exercise
- Set personal fitness goals
- Practical: Warm-up / Exercises/ Ab workout
- Review: Analyze Phases of Dance Aerobic Routine
- Plan and create dance aero routine

Course Name/Course Code: **FITNESS and WELLNES IN DANCE – Social Ballroom Dancing/Latin Dance Sport Dancing (FTDANCE)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor:

Textbook and Online Resources:

- Atlas, R. What is Swing ? Retrieved November 5, 2011 from <http://syrswingdance.org/swing.html>
- Cirio, Ed Origin of Swing Dance Retrieved November 5, 2011 from <http://syrswingdance.org/swing.html>
- Clippinger, K. (2007). *Dance Anatomy and Kinesiology: Principles and Exercise for improving Technique and Avoiding Common Injuries*. Illinois: Human Kinetics.
- Du Beke, A. (2007). *Anton’s Dance Class*. London: Kyle Cathie Limited.
- Eijkhout, V. 9.1 On How To Dress For Dancing Etiquette Retrieved November 5, 2011, from http://eijkhout.net/lead_follow/dress.html
- George, C. (2008) *Ballroom dancing – Study and teaching*, Ballroom dancing. <http://www.cydeas.com/dance/etiquette/>
- Jimena, E. (2006). *Dance Your Way to Fitness*. Phil. Rex Printing Company Inc.
- Kassing, G. and Jay, D. (2003). *Dance Teaching Methods and Curriculum Design: Comprehensive K-12 Dance Education*. US: Human Kinetics.
- Kim, Jean (2006) “Simple Rules in Ballroom Dance Etiquette”
- Kim,J. Simple Rules of Ballroom Dance Etiquette Retrieved November 5, 2011, from
- King, G. (2007) *Ballroom dancing – Study and teaching*, Dance Technique. United States.
- NASPE (2005). *P.E. for lifelong Fitness: The Physical and Recreational Teachers Guide 2nd ed.* US: Human Kinetics.
- Nosratinia, A. *Beyond Dance Etiquette: Success and Enjoyment in Social Dancing* Retrieved November 5, 2011, from <http://www.utdallas.edu/~aria/dance/beyond.html>
- Stanley, A. (2006). *Ballroom Bible: Learn the Art to ballroom dancing*. Pasig City: Philippine Professional Dance Sport Association Inc.
- Zona, C. and George, C. (2008) *Gotta Ballroom*. Champaign, IL: Human Kinetics

Course Information:

- a. Description - This course FTDANCE (Fitness and Wellness in Dance – Social Ballroom dancing/Latin Dancesport Dancing) is a basic course intended principally for students without previous dance experience. It includes dance fundamentals needed to learn selected ballroom dances with emphasis on basic dance steps, rhythm and technique. Young dancers are introduced to the fundamentals of partnership dancing through ballroom dance FINALE presentation that will enhance their sense of rhythms, coordination, and confidence on the dance floor.
- b. Prerequisites/Co-requisites: FWDANCE (Equivalent) FITWELL (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Perform ballroom dance routines and creatively combine variations with rhythm, coordination, correct footwork technique, hold / frame, facial and body expression.
 2. Evaluate and critique personal performance and reflect in ones dancing.
 3. Coordinate with each other by giving appropriate cue to “LEAD” for a well-executed dance routines and for the Lady on how to “FOLLOW”.
 4. State clearly terminologies inherent and germane in each dance, discuss dance history and aesthetics, dance forms, the relationships between dance styles, protocol and etiquette and other historical and cultural trivia.
 5. Consider varied ways of adjusting to different dancing styles, respect for individual differences and uniqueness, animating the Lasallian value of Zeal (enthusiasm)
 6. Participate while enjoying and staying fit towards a stress free life through active participation in support of dance socials and other worthwhile community fitness advocacy projects.
- b. Student outcomes
 - SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Class Orientation
- Introduction to social ballroom dancing/Latin dancesport dancing
- Dance classifications
- Warm-up activities
- Cha cha cha
- Jive

Course Name/Course Code: **Fitness and Wellness in Dual Sport – BADMINTON (FTSPORT)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor:

Textbook and Online Resources:

Grice, Tony. 2008. *Badminton: steps to success 2nded*, Champaign, IL: Human Kinetics. ISBN-0736072292 b
Bloss, Margaret V 2001. *Badminton 8th ed.* Boston: McGraw-Hill. ISBN-0697345343
Badminton Information. (2012). *The History of Badminton*. Retrieved May 30, 2014 from <http://www.badminton-information.com/history-of-badminton.html>
The Badminton Bible. (n.d.). *Badminton footwork*. Retrieved May 30, 2014 from <http://www.badmintonbible.com/articles/footwork/>
ISport Badminton. (n.d.). *Guide to Badminton Footwork*. Retrieved May 30, 2014 from <http://badminton.isport.com/badminton-guides/guide-to-badminton-footwork>

Course Information:

- a. Description- This FTSPORT – Badminton course’s main objective is to give students a clear understanding of the game badminton in which the students will develop the basic skills necessary to play the game of badminton both singles and doubles event. Technical skills include proper handling of racket, the underhand and overhead strokes, executing the different service, drop shots and enhancing offense which is the smash. Instruction will include an emphasis on the fundamental strategies and comprehensive analysis of the rules and regulation of the game on both singles and doubles event. Focus will also be given to fitness and training principles as applied to the game of badminton.
- b. Prerequisites/Co-requisites: FWSPORT (Equivalent) FITWELL (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Demonstrate the fundamental skill needed to play and enjoy the game and employ the techniques and strategies both offensive and defensive manner of the player during the games and interclass tournaments.
 2. Comprehend the basic officiating techniques, rules, regulations, protocol of the game, and the different terminologies in badminton as a game official during intra/interclass tournament.
 3. Evaluate/analyze individual and team game performances and game proceedings as an intelligent participant/spectator.
 4. Discuss with teammates, choose and apply games strategies and technique that are suitable for singles and doubles event.

5. Understand and appreciate the athletic requirements, rule and regulations of the badminton and etiquette during the game both recreational and the competitive aspect.
6. Apply discipline-specific scientific and theoretical concepts critical to the development of effective offensive and defensive playing game strategies and techniques, during the actual game and interclass tournament.
7. Adhere to the values of the physical activities towards a healthy lifestyle and strictly observe safety performance while actively participating in badminton drills/activities to become a well informed and an engaged badminton player.
8. Strengthen awareness of teamwork, sportsmanship, camaraderie, animate fair play and suggest appropriate competitive behaviour, at all times in any activities, respect for game officials during scrimmages and intra/interclass tournament.
9. Participate and support all badminton related activities/fitness advocacies including worthwhile community projects determined by the department/college.

b. Student outcomes

SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Introduction to brief history, skill related fitness, laws of the game and the fundamentals of badminton
- Familiarisation activities and initial assessment of abilities relevant for badminton including grips, hand – eye coordination, footwork, and movement abilities related to badminton as a game official during the inter/intra – class.
- Individual Ball balancing, By partner Ball retrieving, introduction to overhead strokes, underhand strokes, foot works, (six side of shadow play).
- High serve, low – serve and basic footwork to rear court and overhead clear.
- Over-Head Drop, basic footwork (front and back side of the court), and holding the shuttle.
- Cross-court net shot, underhand clear, and proper holding of the shuttle.
- Drive shot, smash, and half smash

Course Name/Course Code: **Fitness and Wellness in Team Sports-Floorball (FTTEAMS)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor: Ralph Andrew Ramos

Textbook and Online Resources:

- International Floorball Federation, Rules and Competition Committee (2014). *The International Floorball Federation: Rules of the Game*. Solna, Sweden: International Floorball Federation.
- Paavilainen, A. (2007). *Individual Technique and Tactics: Teaching Individual Technique and Tactics in Floorball; Instructions and Drills*. Helsinki: International Floorball Federation.
- Paavilainen, A. (2007). *Team Tactics: Teaching Team Tactics in Floorball; Instruction and Drills*. Helsinki: International Floorball Federation.
- Paavilainen, A., Koh, E., Bruun, M., & Liljelund, J. (n.d.). *Floorball: Learn, Start, Play*. Helsinki: International Floorball Federation.

Course Information:

- a. Description - Fitness and Wellness in Floorball (FITEAMS) is a basic module that encourages the students to engage in Floorball as a fitness activity by performing the necessary fundamental skills, understanding the history and rules of the sport, applying different techniques and tactics, and developing game awareness of the sport.
- b. Prerequisites/Co-requisites: FWTEAMS (Equivalent), FITWELL (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. To demonstrate the basic skills in Floorball such as passing, receiving, shooting, and dribbling which will be applied to the actual game.
 2. To understand the nature of the sport—its rules, history and development, equipment used, etc.
 3. To actively participate in class activities which involves the development of skills, game awareness (i.e., offensive and defensive strategies), and compliance to the rules of the game for safety and better performance during matches.
 4. To pursue engaging in healthy lifestyle and optimal well-being through the values and concepts developed from the sport.
 5. To apply Floorball individual skills, techniques and tactics during practice and class tournament matches while observing the rules of the game for safety and optimal performance.
 6. To exhibit and/or explain a general understanding of the sport, applying the rules and regulation, preventing or resolving team conflict, and complimenting or encouraging other players during practice and actual matches.

7. To display appropriate competitive behavior while adhering to fair play during class activities such as drills, exercises, practice and actual matches, including respecting game officials and participation and support for Floorball related activities/fitness advocacy determined by the Department/College.
- b. Student outcomes
- SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Introduction to Floorball
- Floorball rules
- Review of basic passing
- Review of basic shooting
- Advanced dribbling techniques
- Review of dribbling techniques
- Review of Offensive techniques and tactics
- Mid-term Exam
- Formation of teams
- Floorball intraclass tournament
- Culminating activity (Floorball interclass/invitational)

Course Name/Course Code: **Engineering Graphics 1 (GRAPONE)**
Credits and Contact Hours: 1 unit (1 hour lecture)
Instructor:

Textbook and Online Resources:

Madsen, D. *Engineering Drawing & Design*. Delmar Cengage Learning, 2011. Print.

Bethune, J. *Engineering graphics with AutoCAD 2008*. Upper Saddle River, N.J.:
Pearson/Prentice Hall, c2008.

Lamit, and Kathleen Kitto. *Engineering graphics and design : with graphical analysis*.
Minnieapolis : West Pub., c1997.

Lockhart, and Cindy Johnson. *Engineering design communication: conveying design
through graphics*. Upper Saddle River, N.J. : Prentice Hall, c2000.

Course Information:

- a. Description - This is an introductory course in engineering graphics which deals with the training of students to read and execute drawings properly. It is expected that engineers must at least be able to interpret graphic representations of physical objects. Though most often he does not have to prepare the drawing himself, it is imperative that he knows to prepare them and this is best learned by actually making the drawing.
- b. Prerequisites/Co-requisites: None
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Use basic drafting instruments effectively.
 2. Apply the basic techniques, practices, and standards used in engineering graphics in their drawings.
 3. Interpret and execute graphical representations (2D and 3D) of physical objects
- b. Student outcomes
SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of mechanical engineering

Brief List of Topics to be Covered:

- Overview of Engineering Graphics, Graphics instruments, care and usage
- ISO standards: paper sizes and ISO pen point
- Freehand lettering and technical sketching
- Mechanical drawing and lettering with templates
- Geometrical constructions
- Dimensioning and scaling
- Alphabet of lines

- Theory of projections: multi-view, oblique, perspective and axonometric
- Sectioning: full, half, aligned, and revolved
- Auxiliary drawing: primary and secondary revolution
- Intersection and development

Course Name/Course Code: **The Great Works (GREATWK)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Velarde, E. (2014, September 22). *Screenwriter Ricky Lee lived 3 lives in detention*. Retrieved from newsinfo.inquirer.net/639739/screenwriter-ricky-lee-lived-3-lives-in-detention
- Lee, Ricky. *Si Tatang at mga Himala ng Ating Panahon*. Writers Studio Publishing, Inc., 1988. 138, 139-146, 94-137. Print.
- Childs, P. and Williams R.J. *An Introduction to Post-Colonial Theory*. Prentice Hall, 1997. Print.
- Center for Art and Thought. (2013). *The Secret Language*. Retrieved from <http://www.centerforartandthought.org/work/contributor/luisa-igloria>
- Fordham University. (1997). *The White Man's Burden*. Retrieved from <http://sourcebooks.fordham.edu/mod/Kipling.asp>
- Lessing, Doris. (n.d.). *A Sunrise on the Veld*. Retrieved from http://www.mcvts.net/cms/lib07/NJ01911694/Centricity/Domain/137/A_Sunrise_on_the_Veld.doc
- McLeod, J., ed. (n.d.). *The Routledge Companion to Postcolonial Studies*. Routledge, 2007.
- Anderson, Benedict. (n.d.). *Under Three Flags: Anarchism and the Anti-colonial Imagination*. Pasig City: Anvil Publishing, 2006.
- Arcilla, Jose S., S.J., ed. (n.d.). *Understanding the Noli: Its Historical Context and Literary Influences*. Quezon City: Phoenix Publishing House, 1988.
- Joaquin, Nick. "The Novels of Rizal: An Appreciation." *Rizal in Saga: A Life for Student Fans*. N.p.: Philippine National Centennial Commission, Rizal Martyrdom Centennial Commission, and GMA Foundation, Inc., 1996.

Course Information:

- a. Description - The course is designed to center on a theme built around three Great Works from various cultures/disciplines that have exerted influence on the way human beings think about themselves in relation to the world. The course will be taught by a team of three teacher-facilitators who will rotate every four weeks in three classes. Each teacher will facilitate the reading and discussion of one work. Through the course, students are given a venue to participate in multidisciplinary discourses on how a particular Great Work "reads" or "thinks through" the human problems with new perspectives and paradigms.
- b. Prerequisites/Co-requisites: None
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Appreciate the works of Lee, Said, and Rizal in the context of how they have provided important perspectives on colonialism and its consequences as revealed in the postcolonial experience.
 2. Gain a deeper understanding of issues and concerns pertaining to colonialism and its consequences as revealed in the postcolonial experience.
 3. Develop self-assurance and initiative, formed in the process of engaging in collaborative inquiry, self-assessment, and reflection, and through immersion in the La Sallian tradition.
 4. Articulate their reactions to the perspectives that the three great works provide on colonialism and its consequences as revealed in the postcolonial experience.
 5. Develop moral and spiritual reflection and evaluation in relation to self and society.
- b. Student outcomes
 - SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Himala, by Ricky Lee
- Orientalism, by Edward Said
- Noli Me Tangere, by Jose Rizal

Course Name/Course Code: **Introduction to Art (HUMAART)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Clarissa V. Militante

Textbook and Online Resources:

Gompertz, Will. WHAT ARE YOU LOOKING AT? The Surprising, Shocking, and Sometimes Strange Story of 150 Years of Modern Art. Penguin Group (USA); 2012
Harrison, Charles & Wood, Paul (editors). ART in THEORY 1900-1990 An Anthology of Changing Ideas. Blackwell Publishers, Massachusetts; 1992
Arnheim, Rudolf. Film as Art. University of California Press, Berkley & Los Angeles; 1957

Course Information:

- a. Description - Introduction to Literature (HUMAART) is an introduction to the elements and principles of art through a critical examination of the major artworks, movements, and styles in the Philippines and the world. It is principally a study of arts as processes of the creative imaginations in dynamic interaction with its multi-faceted worlds. Through this course, the student is expected to learn how to analyze artworks and to develop deeper appreciation for art.
- b. Prerequisites/Co-requisites: ARTAPRE (Equivalent), ENGLRES (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Acquire a critical appreciation of the visual arts and use this in critiquing a work of art from the perspective of history, ethics, society, and other themes.
 2. Acquire appreciation of Philippine music tradition and be able to contemporize it.
- b. Student outcomes
SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Uses of Art
- Art and Society
- History of Art
- Influential Art Movements
- Philippine National Artists
- Elements of Film
- Philippine Music Tradition
- Contemporizing Philippine folk music

Course Name/Course Code: **Introduction to Literature m (HUMALIT)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Clarissa V. Militante

Textbook and Online Resources:

- Scholes, Phelan, & Kellog. *The Nature of Narrative*. London; Oxford University 1968/2006 Felski, Rita.
- Uses of Literature. Main, USA: Blackwell Publishing, 2008 Greenblatt, Stephen.
- History of Literature. www.jstor.org Kirszner, Laurie G. & Mandell Stephen, R.. Compact Literature Reading, Reacting, Writing (Eight Edition). USA, Wadsworth, Cengage Learning; 2013 Bradford, Richard, Ed.
- Introducing Literary Studies. Prentice Hall/Harvester Wheatshaff; 2006 Kirszner, Laurie G. & Mandell Stephen, R..
- Compact Literature Reading, Reacting, Writing (Eight Edition). USA, Wadsworth, Cengage Learning; 2013 Eagleton, Terry.
- How to Read a Poem. Main, USA: Blackwell Publishing, 2007
- Bloom, Harold. *The Art of Poetry*. N.Y., USA: HarperCollins Publishers, 2004
- Bloom, Harold.
- The Best Poems of the English Language From Chaucer Through Robert Frost*. N.Y., USA: HarperCollins Publishers, 2004
- Shiach, Morag (ed.) *The Cambridge Companion to the Modernist Novel*. Cambridge University Press, 2007 Eagleton, Terry.
- How to Read Literature. Connecticut, USA: Yale University Press, 2013
- “The Folklore of Our Times” by Haruki Murakami
<https://www.theguardian.com/books/2003/aug/02/originalwriting-fiction1>

Course Information:

- a. Description - Introduction to Literature (HUMALIT) is a foundational course that introduces students to literary genres and their forms (fiction - short story & novel - poetry, and drama) through the study of selected literary texts representative of the historical periods and literary movements. Students will be guided through the development of a personal framework for the analysis, appreciation, and assessment of literature through reading and writing about literature.
- b. Prerequisites/Co-requisites: LITERA1 (Equivalent) ENGLRES (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Learn how to read literary text and write about works of Literature (poetry and fiction) through different kinds of essays/papers (response, interpretation, explication, argument, compare and contrast)
 2. Articulate and explain (in oral, written, creative or artistic form) a critical framework for engagement of/with literature, based on what have been learned about the elements of content and form.

b. Student outcomes

SO-E. An ability to recognize, formulate, and solve problems

SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Uses/Functions of Literature
- Poetry
- The poetic form: Sound, Tone, Voice, Diction
- Asian and Philippine poetry
- Drama

Course Name/Course Code: **Fundamentals of Materials Science and Engineering (IMEMATS)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Callister, W. D. and Rethwisch, D. G. (2014). *Materials Science and Engineering: An Introduction*, Hoboken, New Jersey: Wiley.
- Askeland, D. R. and Wright, W. J. (2014). *Essentials of Materials Science and Engineering*, Stamford, Connecticut: Cengage Learning.
- Callister, W. D. and Rethwisch, D. G. (2012). *Fundamentals of Materials Science and Engineering: An Integrated Approach*, 4th Edition, Hoboken, New Jersey: Wiley.
- Carey, F. A. and Giuliano, R. M. (2014). *Organic Chemistry*, New York: McGraw-Hill.
- Chung, Y. W. (2007). *Introduction to Materials Science and Engineering*. Boca Raton, Florida: CRC / Taylor & Francis.
- Gere, J. M. and Goodno, B. J. (2013). *Mechanics of Materials*, Stamford, Connecticut: Cengage Learning
- Lee, J. G. (2012). *Computational Materials Science: An Introduction*, Boca Raton, FL: Taylor & Francis.
- Perry, R.H. and Green, D.W., editors (2007). *Perry's Chemical Engineers' Handbook*. New York: McGraw-Hill Professional.

Course Information:

- a. Description - The course deals with the study of the science of materials, with emphasis on metals, polymers, ceramics, and composite materials. These materials of engineering, along with their principal properties, uses and limitations, are discussed. The course also covers methods of material selection, corrosion science, and heat treatment.
- b. Prerequisites/Co-requisites: MATSCIE (Equivalent), MEDEFOR (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Generates ideas, designs or systems with resourcefulness, imagination, and originality, in order to meet current and emerging needs of society.
 2. Uses innovative technologies to solve problems and make decisions pertaining to material selection in engineering applications.
 3. Constructs and applies knowledge, concepts and generalizations in making coherent ideas aligned with Christian principles.
 4. Communicates effectively and confidently to different audiences.
 5. Listens actively to the intent and the spirit of others' words, and respond orally and in writing, as appropriate.

6. Composes and comprehends a written report or text to convey information that is meaningful to society.
7. Uses individual and group performances to express ideas, thoughts, feelings, values and understanding.
8. Reflects on problems and issues related to engineering design and materials that contribute to the development of a better society.
9. Plans, organizes, manages and evaluates own thinking to develop practical and economical solutions.
10. Develop awareness of the environmental and societal issues related to the use of engineering materials.
11. Discern, critic and interpret obtained solutions.
12. Creates materials and products that achieve their purpose and objectives with honesty.
13. Develops and incorporates Christian leadership skills to positively attain a communal goal through collaborative effort.
14. Nourishes relationship with God, self, others and the environment with compassion, sensitivity, respect, integrity and empathy.
15. Exhibits patience in the process of materials selection.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice

Brief List of Topics to be Covered:

- Introduction to Material Science and Engineering Materials
- Properties and Behavior of Materials
- Corrosion
- Heat Treatment
- Polymers, Ceramics and Composites
- Electrical Properties
- Dielectric Behavior
- Magnetic Properties
- Optical Properties
- Thermal Properties
- Economic, Environmental, and Societal Issues in Materials Science and Engineering

Course Name/Course Code: **Integral Calculus (INTECAL)**
Credits and Contact Hours: 4 units (4 hours lecture)
Instructor:

Textbook and Online Resources:

- Stewart, James (2011). Stewart's Calculus Early Transcendentals. Philippine Edition, ISBN-13: 978-981-4352-83-3.
- Stewart, J. (2013). Essential Calculus: Early Transcendental. Brooks/Cole Cengage Learning
- Hass, J. (2009). University Calculus: Elements and Early Transcendental. Boston: Pearson/Addison Wesley.
- Larson, R. (2014). Calculus: An Applied Approach. Boston: Houghton Mifflin
- Larson, R. Edwards B. (2014) Calculus Boston, Massachusetts : Brooks/Cole, Cengage Learning
- Zill, D. G. (2009). A First Course in Differential Equations with Modeling Applications, CA: Brooks/Cole, Cengage Learning.
- Stewart, J. (2008). Metric International Version Multi-Variable Calculus. Belmont, C. A.: Thomson Brooks/Cole.
- Smith, R. T. (2012). Calculus. Boston: McGraw Hill Higher Education.
- Brannan, J. R. and Boyce, W. E. (2007). Differential Equations: An Introduction to Modern Methods and Applications, NJ: John Wiley and Sons, Inc.
- Leithold, L. (1996). The Calculus ,New York: HarperCollins Publishers Inc.
- Edwards,C., Penney, D. (1994). Calculus with Analytic Geometry, 4th Edition, New Jersey: Prentice-Hall, Inc.
- Purcell, E., Varberg, D. (1984). Calculus with Analytic Geometry, 4th Edition, New Jersey: Prentice-Hall, Inc.

Course Information:

- a. Description - This course (INTECAL - INTEGRAL CALCULUS)introduces the concept of integration and its application to some physical problems such as evaluation of areas, volumes of revolution, force, and work. The fundamental formulas and various techniques of integration are taken up and applied to both single variable and multi-variable functions. The course also includes tracing of functions of two variables for a better appreciation of the interpretation of the double and triple integral as volume of a three-dimensional region bounded by two or more surfaces.
- b. Prerequisites/Co-requisites: DIFFCAL (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Explain the basic concepts of integration and properly carry out integration through the use of the fundamental formulas using single integration. Properly identify indefinite and definite integrals.
 2. Properly carry out the various techniques of integration.

3. Identify the different Improper Integrals.
4. Correctly apply the concept of integration in solving plane areas and areas between curves.
5. Correctly apply the concept of integration in solving problems involving volumes, work and force.
6. Evaluate multiple integrals including inversion of orders and change of coordinates.
7. Define three-dimensional space and sketch three-dimensional regions bounded by several surfaces.
8. Evaluate volumes of three-dimensional regions bounded by two or more surfaces through the use of the double or triple integrals.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of chemical engineering.

Brief List of Topics to be Covered:

- Integration Concepts/Formulas
- Integration Techniques
- Improper Integrals
- Application of Definite Integral
- Other Applications
- Multiple Integrals (Inversion of order/ change of coordinates)
- Surface tracing
- Multiple Integrals as Volume

Course Name/Course Code: **Buhay, Nagawa at Sinulat ni Dr. Jose Rizal (KASPIL1)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- De Viana, Augusto V. 2011. Dr. Jose Rizal: social reformer and his patriot. Manila: Rex Book Store.
- Habulan, Ani. (Ed.). 2011. The Anvil Jose Reader on the occasion of the sesquicentennial of his birth (1861-2000). Manila: Anvil Pub.
- Ocampo, Nilo. 2011. Kristong Pilipino: Pananampalataya kay Jose Rizal. QC: Bagong Kasaysayan.
- Perdon, Renato. 2011. Understanding Jose Rizal. N.S.W. : Manila Prints.
- Rizal, Jose. 2006. Noli Me Tangere. Trans. by Leon Ma. Guerrero. N.P.: Guerrero Pub.
- Rizal, Jose. 2006. El Filibusterismo. Trans. by Leon Ma. Guerrero. N.P.: Guerrero Pub.
- Valdez, Maria Stella. 2007. Dr. Jose Rizal and the writing of history. Manila: Rex Book Store.
- The Complete Jose Rizal - Filipinia NET Collection. Retrieved May 14, 2010, from <http://www.filipiniana.net/microsite/cjr/index.jsp>. Isang online site na nagtatampok ng mga materyales hinggil kay Jose Rizal.
- “An Excerpt from Elizabeth Medina's Annotated Translation of W.E. Retana's 1907 Biography of José Rizal.” Retrieved May 4, 2011, from www.univie.ac.at/Voelkerkunde/apsis/aufi/rizal/retana2.htm. Isang online site hinggil sa halaw mula sa sinudlingang salin ng talambuhay ni Retana.
- Harrison, Francis Burton. “Rizal as a Patriot, Author, and Scientist.” Retrieved May 4, 2011 from <http://classicwebarchive.org/web20040620135109/http://www.univie.ac.at/Voelkerkunde/apsis/aufi/rizal/r-scient.htm>. Isang online site na nagtataglay ng akda ni Francis Burton Harrison hinggil kay Rizal.
- Philippine History. Retrieved May 14, 2010, from <http://www.philippinehistory.net>. Isang online site na nagsisilbing research portal hinggil sa kasaysayan ng Pilipinas.
- “Rizal’s Heritage Trail in Germany.” Retrieved May 4, 2011 from <http://www.knights-of-rizal-bonn.info/Rizal-in-Germany/frontpage.htm>. Isang online site na nagtatampok sa bakas ng pamana ni Rizal sa Alemanya.
- “Rizal’s Travels in Switzerland.” Retrieved May 4, 2011 from <http://www.knights-of-rizal-bonn.info/Rizal-in-Switzerland/Swiss.htm>. Isang online site na nagtatampok sa mga paglalakbay ni Rizal sa Switzerland.
- “The life and Writings of Dr. Jose Rizal.” Retrieved May 20, 2011, from <http://www.joserizal.info>. Isang online site hinggil sa buhay at mga akda ni Dr. Jose Rizal.
- “The travel diaries of José Rizal.” Retrieved May 4, 2011 from www.livejournal.com/users/rizaldiaries. Isang online site na nagtatampok ng mga talaarawan ng paglalakbay ni Jose Rizal.
- “Works by Rizal.” Retrieved May 14, 2010, from <http://www.gutenberg.org/browse/authors/r#a2183>. Isang online site na nagtatampok sa mga akda ni Rizal.
- “Works.” Retrieved May 20, 2011, from <http://www.joserizal.ph/in01.html>. Isang online site hinggil sa mga akda ni Jose Rizal.

Course Information:

- a. Description - Ang KASPIL11 ay isang foundational course. Ang kritikal na pag-aaral at pagsusuri sa buhay, mga akda at mga nagawa ni Dr. Jose Rizal ay isang pagsusuring pangkasaysayan. Tinatalakay din sa kurso ang panahong kolonyalismong Espanyol sa Pilipinas na may diin sa ika-19 na daantaon na siyang panahong ginalawan ni Dr. Jose Rizal. Ang kurso ay alinsunod sa itinatadhana at diwa ng Batas Rizal (R.A. 1425, 1956) na naglalayong matugunan ang pangangailangan ng kasalukuyang panahon na mapagtibay at maisabuhay ang damdaming makabansa ng mga mag-aaral.
- b. Prerequisites/Co-requisites: JPRIZAL (Equivalent) JPRIZAL (Equivalent)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Makapaghahanda ang mga mag-aaral ng isang mapaglagom na output/proyekto na nagpapamalas ng pagsasabuhay ng damdaming makabansa na naaayon sa mandato ng Batas Rizal at malalim na pang-unawa hinggil sa anumang aspekto ng buhay, mga gawa at mga akda ng pambansang bayani.
- b. Student outcomes
 - SO-G. An ability to effectively communicate orally and in writing using the Filipino language

Brief List of Topics to be Covered:

- Ang Kasaysayan bilang isang Disiplina
- Ang Pagkabuo ng Bansang Pilipinas sa Konteksto ng Kolonyalismong Espanyol
- Ang Kasaysayan ng Pagkahubog at Pag-unlad ng Pagkatao, Paniniwala at Pilosopiya ni Rizal
- Iba't- ibang perspektibo at diskurso sa pagsusuri sa mga akda at mga nagawa ni Rizal
- Kaangkupan at Kahalagahan ng Pag-aaral ng buhay, mga akda at mga nagawa ni Rizal sa buhay ng mga mag-aaral

Course Name/Course Code: **Kasaysayan ng Pilipinas (KASPIL2)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Abinales, Patricio N. ed. 2008. *The US and the war on terror in the Philippines*. Manila: Anvil.
- Bascara, Cornelio. 2002. *Stories from the Margins: the Other Narrative of the Philippine-Spanish Revolution*. Manila: UST Publishing House.
- Coronel, Sheila. et. al. 2004. *The Rulemakers*. QC: Anvil Publishing House.
- Corpuz, Onofre D. 2005. *Roots of the Filipino Nation 2nd Ed.* QC: UP Press.
- Escalante, Rene. 2007. *The Bearer of Pax Americana: the Philippine Career of William Howard Taft, 1900-1903*. Quezon City: New Day Publishers..
- Gripaldo, Eden. et. al 2003. *Kasaysayan ng Filipinas at mga Institusyong Pilipino*. Quezon City: Sentro ng Wikang Filipino.
- Lico, Gerardo. 2003. *Edifice Complex: Power, Myth, and Marcos State Architecture*. Quezon City: ADMU Press.
- Mactal, Ronaldo. 2003. *Ang Pulitika ng Imperyalismo at ang Rebolusyong Pilipino 1895-1902*. Manila: DLSU Press.
- Mijares, Armand, et.al. 2010. "New evidence for a 67,000-year-old human presence at Callao Cave, Luzon, Philippines." *Journal of Human Evolution* 59: 123-132.
- Simbulan, Dante. 2005. *The Modern Principalia*. QC: UP Press.
- Solheim, Wilhelm. 2006. *Archaeology and Culture in Southeast Asia: Unravelling the Nusantao*. Quezon City: UP Press.
- <http://kartilya-katipunan.blogspot.com/>
www.filipiniana.net
www.elaput.org
<http://kasaysayan-kkk.info/>
<http://bonifaciopapers.blogspot.com/>
<http://www.bibingka.com>

Course Information:

- a. Description - Ang KasPil2 (Kasaysayan ng Pilipinas) ay isang kritikal na pag-aaral ng kasaysayan ng Pilipinas at kanyang mga institusyong pulitikal, ekonomiko, sosyal at kultural mula sa panahong prehistoria hanggang sa kasalukuyan mula sa pananaw ng isang Pilipino. Tinatalakay nito ang pagkabuo, pag-unlad, at ang mga hinarap na suliranin ng bansang Pilipinas sa bawat yugto ng kasaysayan. Sa kursong ito, maipauunawa sa mga mag-aaral ang aral ng kasaysayan at kabuluhan nito sa pagbibigay solusyon sa mga isyung kinakaharap ng bansa sa kasalukuyan.
- b. Prerequisites/Co-requisites: PHILHIS (Equivalent) PHILHIS (Equivalent) KASPIL1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Malawak, malalim at mapanuri na pag-unawa na ang kasalukuyang kalagayan ng at kaganapan sa bansa ay may malalim na pinag-uugatan sa ating kasaysayan.
 2. Pagkatanto na ang mga problemang hinaharap ng bansa sa kasalukuyan ay malaon nang kinabaka ng mga naunang henerasyon; at mula sa aral ng nakaraan ay makapaglalatag ng karampatang solusyon o panukala upang tugunan ang naturang suliranin.
- b. Student outcomes

SO-G. An ability to effectively communicate orally and in writing using the Filipino language

Brief List of Topics to be Covered:

- Ang Disiplina ng Kasaysayan
- Prehistoria at Sinaunang Kabihasan
- Hamon ng Kolonyalismo at Tugon ng Mamamayang Pilipino
- Hamon ng Kalayaan at Pagsasarili
- Mga Kontemporaryong Usapin at Suliranin ng Naka-Ugat sa Kasaysayan

Course Name/Course Code: **General Chemistry Laboratory 1 for Engineering (LBYCH11)**
Credits and Contact Hours: 1 unit (1 hour lecture)
Instructor:

Textbook and Online Resources:

Slowinski, E.J., Wolsey, W.C. & Rosel, R.C. (2012). Chemistry Laboratory Manual for Engineering Majors (Philippine edition). Cengage Learning.
Eubanks, L.P. et al., Chemistry in Context: Applying Chemistry to Society, 6th Edition, McGraw-Hill Higher Education, USA 2009
Hill, J et al., Chemistry for Changing Times, 13th Edition, Pearson Education International, USA 2013
Chang, R., Chemistry, 10th Edition, McGraw-Hill Professional, 2010
McMurry, J., et al., Fundamentals of general, organic and biological chemistry, Pearson Education International, U.S.A., 2013.
Silberberg, M.S., Principles of General Chemistry, McGraw-Hill, U.S.A., 2013.
American Chemical Society. (n.d.). *Chemical Science Safety in the Classroom*. Retrieved from <http://www.acs.org/content/acs/en/about/governance/committees/chemicalsafety/chemical-safety-in0the-classroom.html>
<http://www.msds.com>

Course Information:

- a. Description - A course developing basic laboratory skills. It includes experiments and exercises illustrating the concepts covered in General Chemistry 1.
- b. Prerequisites/Co-requisites: CMLAONE (Equivalent), LBYCH08 (Equivalent), LBYCH08 (Equivalent), LBYCH14 (Equivalent), LBYCH14 (Equivalent), NATLAB1 (Generic)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. At the end of the course, the students are expected to execute specific procedural tasks in laboratory experiments and be aware of responsible use of chemicals by practicing proper waste disposal.
- b. Student outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Safety in the Laboratory
- Quantitative Measurements and Significant Figures
- Chemical Formulas
- Chemical Reactions and Equations
- Quantitative Measurements and Significant Figures
- Lewis Structures
- Liquids
- Stoichiometry
- Solutions

Course Name/Course Code: **Computer Fundamentals and Programming 1 (LBYEC71)**
Credits and Contact Hours: 1 unit (1 hour lecture)
Instructor:

Textbook and Online Resources:

- Hanly, J., & Koffman, E. (1995). C program design for engineers. Reading, Mass.: Addison-Wesley Pub.
- Schildt, H. (2003). C/C programmer's reference (3rd ed.). New York: McGraw-Hill/Osborne.
- Ritchie, D., Kernighan, B., & Laboratories, I. (2015). The C programming language (2nd ed). Murray Hill, N.J.: Bell Laboratories.
- Borland, T. (1990). Turbo C++ Reference and User's Manuals. Scotts Valley, Calif.: Borland International.
- Kelley, A., & Pohl, I. (1987). C by dissection: The essentials of C programming. Menlo Park, Calif.: Benjamin/Cummings Pub
- Reddy, R., & Ziegler, C. (2010). C programming for scientists and engineers with applications. Sudbury, Mass.: Jones and Bartlett.
- Dey, K., & Bandyopadhyay, S. (2010). C programming essentials. Delhi India: Pearson.
- Balagurusamy, E. (2011). Programming in ANSI C (5th ed.). New Delhi: Tata McGraw Hill Education.
- Mittal, A. (2010). Programming in C. New Delhi, India: Dorling Kindersley (India).
<http://www.cprogramming.com/tutorial/c-tutorial.html>
<https://fresh2refresh.com/c-tutorial-for-beginners/>
<http://www.tutorialspoint.com/cprogramming/>
<http://www.cprogramming.com/tutorial.html>

Course Information:

- a. Description - This is an introductory course to computer software and computer technology. It covers topics on office productivity, web-authoring and engineering problem-solving methodology. The students will have hands-on experience in applying the concepts discussed in the course to engineering applications. In this course, students are also introduced to algorithm development in preparation for more advanced computer programming courses.
- b. Prerequisites/Co-requisites: ENGALG1 (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Identify the fundamental processes involved in computing and familiarize themselves with various computer software tools.

2. Apply the use of office productivity, web-authoring and problem-solving methodology to practical and engineering applications.
3. Design, compile, test, run, and implement C language program
4. Show good resourcefulness by providing alternative solutions to varied problems on programming in varied real life situations
5. Develop troubleshooting skills in implementing C-language program.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Word Processing and Excel
- Web-Authoring using HTML
- Engineering Problem
- Introduction to C Programming and Basic Input / Output
- Selective Structure (Conditional Statements)
- Repetition & loop Structure (Iterative Statements and Series Generation)
- Programming Engineering Applications in C using Modular Programming
- One Dimensional

Course Name/Course Code: **Computer Fundamentals Programming 2 (LBYEC72)**
Credits and Contact Hours: 1 unit (1 hour lecture)
Instructor:

Textbook and Online Resources:

- Mohan, P. (2010). Fundamentals of information technology (Rev. ed.). Mumbai India: Himalaya Pub. House.
- Ritchie, D., Kernighan, B., & Laboratories, I. (2015). The C programming language (2nd ed). Murray Hill, N.J.: Bell Laboratories.
- Reddy, R., & Ziegler, C. (2010). C programming for scientists and engineers with applications. Sudbury, Mass.: Jones and Bartlett.
- Dey, K., & Bandyopadhyay, S. (2010). C programming essentials. Delhi [India: Pearson.
- Chhabra, J. (2010). C programming concepts: With problems and solutions. New Delhi: Tata McGraw-Hill.
- Balagurusamy, E. (2011). Programming in ANSI C (5th ed.). New Delhi: Tata McGraw Hill Education.
- King, K. (2011). C Programming: A Modern Approach
- Kochan, S. (2004). Programming in C (3rd ed.) .
- Stroustrup, B. (2014). Programming: Principles and Practice Using C++.
- LBYEC72 Lab Manual
- <http://www.programmingsimplified.com/>
- <http://www.c4learn.com/>

Course Information:

- a. Description - This course introduces the conceptual aspects of problem solving, algorithm design and the nature of data incorporated with the more specific and implementation-directed aspects of programming syntax and constructs of C programming. The course also presents the development of algorithms and the application of C programming in engineering problem solving, The importance of developing reliable, robust and maintainable solutions is emphasized throughout.
- b. Prerequisites/Co-requisites: LBYEC71 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Apply knowledge of computing and mathematics appropriate to the discipline; specifically to include the application of mathematics, science and engineering to solve and reason about computational problems
 2. Analyze a problem, and identify and define the computing requirements appropriate to its solution
 3. Apply mathematical foundations and computer science theory, in particular principles of algorithmic design and complexity analysis
 4. Design, compile, test, run implement C Language program

b. Student outcomes

SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization

Brief List of Topics to be Covered:

- Problem solving process.
- Flowcharting
- Pseudo code and Algorithm
- Relational Operators
- Boolean Operators
- Arithmetic Operators
- Conditional Statements
- Iteration/ Loops
- Nested Conditional Statements
- Nested Iterative Statements

- Arrays
- Strings
- Functions, Structures, Structure Arrays, and Structure Pointers
- Pointers
- Functions and Pass-by-value
- Functions and Pass-by-reference
- Structures, Structure Arrays, and Complex Data Types
- Structures, Structure Pointers, and Passing of Structure References to Functions
- Discussions on Dynamic Memory Allocation
- Project Development
- Project Presentation

Course Name/Course Code: **Electric Circuits I Laboratory for non-ECE (LBYES74)**
Credits and Contact Hours: 1 unit (1 hour lecture)
Instructor:

Textbook and Online Resources:

Guitierrez. M. *Laboratory Manual in Electric Circuits I*. De La Salle University Press, 1996. Print.
<http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-002-circuits-and-electronics-spring-2007/lecture-notes/>
http://www.ibiblio.org/kuphaldt/electricCircuits/DC/DC_10.html
<http://moodle.cecs.pdx.edu/course/view.php?id=16>

Course Information:

- a. Description - This course covers the laboratory applications of topics discussed in Elementary Electrical Engineering (CIVELEN) lecture.
- b. Prerequisites/Co-requisites: ELENPRI (Co-requisite), LBYES1A (Equivalent), LBYES75 (Equivalent), LBYESE1 (Equivalent), LBYPH12 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Enumerate and understand the rules, regulations, safety precautions and procedures in the Electrical Laboratory
 - 2. Identify all the equipment in the Lab and state their functions. Have a mastery of the VOM, its various functions, modes, limits, connection, and proper handling. To identify different kinds of resistors, read their coded rated value and contrast it to their measured value.
 - 3. Identify various series, parallel, and series/parallel combinations of resistors. To implement these and compare their measured values to the computed expected values.
 - 4. Show mastery of Ohm's Law by stating its applicability and the relationship of V, I, and R through graphs and equations as derived from experimental data.
 - 5. Measure the actual power dissipated by a resistor and combinations of resistors in a live circuit. To convert these to common units such as Watts, mWatts, and BTU.
 - 6. Convert and implement delta resistor connections to its wye equivalent and vice-versa. To compare the resulting measured values from theoretical values.
 - 7. Validate the DC Maximum Power Transfer Theorem by measuring the power transfer under various loads.
 - 8. Show the consistency of measured voltage and currents in DC circuits as predicted by Kirchhoff's Voltage and Current Laws.

9. Confirm the Superposition Theorem by measuring the individual contribution of each source in a multiple source DC circuit. To sum these contributions and compare it to the measured total effect.
 10. Verify Thevenin's Theorem by measuring the open circuit voltage and short circuit current of a load in a DC circuit. To compare these values to those measured by implementing the circuit's Thevenin Equivalent.
 11. Exhibit mastery of concepts, use of equipment & VOM, and safety procedures.
 12. Design practical series/parallel circuits and develop skills in PCB making.
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Rules and Regulations
- Safety Precautions
- Rules to be Followed in Performing an Experiment
- Making Preliminary and Final Reports
- Format of the Front Page Cover of the Final Report
- Familiarization to Equipment/Apparatus
- Series and Parallel Equivalent Resistance
- Resistances in Series and in Series-Parallel
- Ohm's Law
- Circuit Solution
- Power in DC Circuits-I
- Power in DC Circuits-II
- Delta-Wye Transformations
- Kirchhoff's Laws and Closed Loops
- Thevenin's Theorem
- AC Voltage and Current
- Series RC and RL Circuits

Course Name/Course Code: **Engineering Graphics 2 (LBYMEEA)**
Credits and Contact Hours: 1 unit (1 hour lecture)
Instructor:

Textbook and Online Resources:

Finkelstein, E. (2012). AutoCAD 2012 & AutoCAD LT 2012 bible. Indianapolis, IN :
Wiley, c2011.

Lombard, M. (2013). SolidWorks 2013 Bible. Wiley Publishing Inc, Indianapolis

Hamad, M. (2013). AutoCAD 2013 beginning and intermediate. Dulles, VA :
Mercury Learning and Information.

Dix, M. (2009). Discovering AutoCAD, Pearson International ed. Pearson Prentice Hall

Betoline, G. (2009). Technical Graphics Communication 4th Ed. McGraw-Hill Higher
Education , New York

Course Information:

- a. Description - The course deals mainly on the use of CAD software, particularly AutoCAD and SolidWorks in mechanical design and drafting. Basic concepts on the use of computer-aided design and drafting are tackled while practical hands-on exercises on mechanical design and drafting using AutoCAD and SolidWorks are given emphasis.
- b. Prerequisites/Co-requisites: GRAPTWO (Equivalent), GRAPONE (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Learn and apply CAD tools that is used to create basic shape
 2. Learn and apply tools and techniques to modify and manipulate shapes in CAD
 3. Learn different methods and standards for dimensioning and annotation in CAD.
 4. Apply different CAD tools and techniques to create engineering drawings
 5. Apply different CAD tools to present a technology based product in the engineering standard through the creation of drawings.
- b. Student outcomes
SO-I. An ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization

Brief List of Topics to be Covered:

- The engineering design process
- CAD in engineering and CAD software principles

- Introduction to AutoCAD software
- Basic drawing and editing tools part 1
- Basic drawing and editing tools part 2
- Detailing and annotations
- Sheet composition, scaling and plotting
- Presentation of term project concepts
- Advanced editing tools
- Isometric drawing techniques
- Section drawing
- Drawing Construction techniques
- Drawing enhancements
- Introduction of SolidWorks and parametric modeling software

Course Name/Course Code: **Physics Laboratory 1 (LBYPH11)**
Credits and Contact Hours: 1 unit (1 hour lecture)
Instructor:

Textbook and Online Resources:

Laboratory Physics Manual 1:

<http://www.dlsu.edu.ph/academics/colleges/cos/physics/experiments.asp>

Young, H. and Freedman, R. (2016). University physics (14th edition). New York: Addison-Wesley Publishing Company

Halliday, D., Resnick, R: and Walker J. (2014). Fundamentals of physics (10th edition). New York: John Wiley and Sons.

Serway, R. and Jewett, J. (2014), Physics for scientists and engineers with modern physics (9th edition). Chicago: Saunders College Publishing.

Cutnell, J., Johnson, K., Young, D. and Stadler, S. (2015). Physics (10th edition) Wiley and Sons. Giambattista, A., Richardson, B. and Richardson, R. (2016). Physics (3rd Edition) McGraw Hill.

"Physlet physics: interactive illustrations, explorations, and problems for introductory physics" by Christian, Wolfgang. Upper Saddle River, N.J.: Prentice Hall, Pearson Education, c2004. Location: Circulation, 3rdFlr. QC30 .C47 2004; CD02355

Physlets at Boston University, <http://physics.bu.edu/~duffy/classroom.html>. Mechanics and Heat are in the first semester set. Electricity & Magnetism are in the second semester set.

MIT OpenCourseWare – Physics, <https://ocw.mit.edu/courses/find-by-topic/#cat=science&subcat=physics>

<http://ivle.dlsu.edu.ph/workspace/>

www.phet.colorado.edu

<http://webphysics.davidson.edu/applets/applets.html>

Course Information:

- a. Description - This laboratory course is designed for students from the College of Engineering taking up ENGPHY1 . Experiments in mechanics, heat and activities to develop basic laboratory skills will be performed. The results of the experiments should lead the students to form proper physics concepts and provide the basis for further explanations in the lecture class.
- b. Prerequisites/Co-requisites: ENGPHY1 (Co-requisite), LBYPHY1 (Equivalent)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Identify and apply the physical laws in explaining observations from experiments. Determine the appropriate use of equipment and apply estimation, precision and accuracy of measurements. Analyze and interpret graphs and write the corresponding equation

2. Analyze and explain the relationship between the experimental variables and formulate appropriate generalizations.
3. Manifest intellectual honesty, patience, perseverance, self-discipline, critical and logical thinking, industry and creativity in performing each experiment. Work harmoniously and productively with others. Practice proper handling of equipment and safety rules in the laboratory.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Significant Figures
- Errors and Uncertainty of Measurements
- Graphs and Equations
- Uniform Acceleration
- Composition of Concurrent Forces
- Newton's Second Law
- Work-Energy Theorem and Conservation of Energy
- Conservation of Linear Momentum and Torque
- Specific Heat of Solids
- Coefficient of Linear Expansion and Heat of Fusion
- Centripetal Force
- Projectile Motion
- Coefficient of Friction
- Specific Gravity
- Mechanical Equivalent of Heat
- Individual hands-on experiment
- Individual written report

Course Name/Course Code: **Physics Laboratory 2 (LBYPH12)**
Credits and Contact Hours: 1 unit (1 hour lecture)
Instructor:

Textbook and Online Resources:

Physics laboratory 2 (compiled experiments in heat, electricity & magnetism and optics) <http://www.dlsu.edu.ph/academics/colleges/cos/physics/experiments.asp>
Young, H. and Freedman, R. (2016). University physics (14th edition). New York: Addison- Wesley Publishing Company
Halliday, D., Resnick, R: and Walker J. (2014). Fundamentals of physics (10th edition). New York: John Wiley and Sons.
Serway, R. and Jewett, J. (2014), *Physics for scientists and engineers with modern physics (9th edition)*. Chicago: Saunders College Publishing.
Cutnell, J., Johnson, K., Young, D. and Stadler, S. (2015). Physics (10th edition) Wiley and Sons.
Giambattista, A., Richardson, B. and Richardson, R. (2016). Physics (3rd Edition) McGraw Hill.
Physlet physics: interactive illustrations, explorations, and problems for introductory physics" by Christian, Wolfgang. Upper Saddle River, N.J.: Prentice Hall, Pearson Education, c2004. Location: Circulation, 3rdFlr. QC30 .C47 2004; CD02355
<http://ivle.dlsu.edu.ph/workspace/default.asp>
www.phet.colorado.edu
<http://webphysics.davidson.edu/applets/applets.html>
<http://physics.bu.edu/~duffy/classroom.html>
<https://ocw.mit.edu/courses/find-bytopic/#cat=science&subcat=physics>

Course Information:

- a. Description - This course complements the lecture courses on PHYSICS 2 for engineering, science and computer studies students. It covers activities to further develop basic laboratory skills initially practiced in PHYSICS LABORATORY 1. Selected experiments in electricity and magnetism, waves and optics will be performed.
- b. Prerequisites/Co-requisites: ENGPHY2 (Co-requisite), LBYPHY2 (Equivalent), LBYPH11 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Measure accurately and apply the physical laws and mathematical equations in analyzing data, graphs, and observations from experiments.
 2. Explain the relationship between the experimental variables and formulate appropriate generalizations through oral presentation and well written laboratory reports.

3. Manifest intellectual honesty and self-discipline in preparing reports.
 4. Volunteer and share the knowledge in physics for the under-privileged.
- b. Student outcomes
- SO-A. An ability to apply knowledge of mathematics, physical, life and information sciences; and engineering sciences appropriate to the field of practice.

Brief List of Topics to be Covered:

- Resistors in Series and Parallel
- EMF, Terminal Voltage and Internal Resistance
- Kirchhoff's Rules
- Construction of Voltmeter and Ammeter
- Magnetic Field and Demo of Faraday's Law
- Standing Waves on a String
- Laws of Reflection and Refraction
- Image Formation by Converging Lens
- Image Formation by Spherical Mirror

Course Name/Course Code: **Mechanics of Deformable Bodies (MEDEFOR)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

Philpot, T. A. *Mechanics of Materials, 3rd Ed. SI Version*. Wiley and Sons, 2014. Print.
Singer, F., and Pytel, A. *Strength of Materials, 4th Ed.* Addison-Wesley Educational Publishers, Incorporated. Print.
Hibbeler, R. C. *Mechanics of Materials, 8th Ed.* Prentice Hall, 2010. Print.

Course Information:

- a. Description - Mechanics of Deformable Bodies is a branch of Engineering Mechanics which deals with the study of the external and internal effects of forces and environmental factors on deformable bodies. This course is essential for an engineer in designing various types of structures and machines. The topics that will be discussed in this course are: internal equilibrium of load carrying members and assemblies, concepts of stress, strain and deformation, basic properties of engineering materials, analysis and design of bar-type members subjected to axial loads, torsion, bending, shear, combined loading and/or thermal loads, applications of bi-axial state of stress in pressure vessels, stress transformations and Mohr's circle for plane stress
- b. Prerequisites/Co-requisites: STRENGTH (Equivalent), DYNAMIC (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Identify the properties of engineering materials and their relevance to structural and machine design. Compute the internal forces and internal effects on structural members subjected to axial loads, torsion, flexure and shear, and/or thermal loads.
 2. Know the concept of strain and compute the deformations experienced by deformable bodies as a result of internal stress.
 3. Formulate shear and bending moment equations and construct shear and bending moment diagrams.
 4. Analyze and design structural members subjected to shear stress, bending stress and/or combined loadings.
 5. Analyze and design thin-walled pressure vessels.
 6. Learn and understand the concept of stress transformation using plane stress equilibrium equations and theory of Mohr's circle for plane stress
- b. Student outcomes
SO-A. An ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of civil engineering

Brief List of Topics to be Covered:

- Simple Stresses: Normal Stress under Axial Loading, Shearing Stress
- Bearing Stress
- Deformation
- Elastic Deformation of an Axially Loaded Member
- Statically Indeterminate Axially Loaded Members
- Thermal Strain, Thermal Effects on Axial Deformation
- Torsional Shear Stress, Torsional Deformation, Angle of Twist, Power Transmission
- Statically determinate & indeterminate torsion members
- Equilibrium of Beam
- Shear and Bending Moment Diagrams
- Bending Stress; Elastic Flexure Formula
- Analysis of Bending Stresses in Beams
- Shear Stress in Beams
- Thin-Walled Vessels
- Stress Transformations: Equilibrium of Stress Element, Plane Stress, General Equations of Plane Stress Transformation
- Mohr's Circle for Plane Stress
- Combined Loadings and Stresses: Bending due to Eccentric Axial Loads (Combined Axial and Flexure), Combined Flexure and Shear
- Combined Axial and Torsional Loads

Course Name/Course Code: **Personal Effectiveness Foundation (PERSEF 1)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor:

Textbook and Online Resources:

Various self-assessment surveys and online resources will be used for each of the modules.

Course Information:

- a. Description - The Lasallian Core Curriculum of the DLSU–Manila aims at developing a whole person who embodies the Lasallian values and demonstrates professional skills as well as personal competencies. This individual is mature in all aspects of his/her person, with a nationalistic and humanistic outlook and a carefully reasoned faith.

PERSEF1 is a foundational course in the Lasallian Core Curriculum, taken by all students in their first year. It provides the information and skills that they need as they blend into college life. The course covers basic topics in each of the 5 themes of total personal development, designed to complement their academic and spiritual growth. These themes will be further explored in the 2 other Personal Effectiveness courses which the students will take in later years.

- b. Prerequisites/Co-requisites: None
c. Required Course

Specific Goals for the Course:

- a. Specific outcomes
1. Rediscover and determine their personal strengths and weaknesses through various self-awareness activities,
 2. Define and understand various roles and responsibilities in life by creating a personal mission statement,
 3. Appreciate the importance of etiquette and its different areas through an etiquette awareness/observation paper,
 4. Discuss personal opinions on various issues on love relationships in a form of a debate,
 5. Analyze their career options based on their personality, interests, and needs using survey questionnaires and assessments,
 6. Illustrate the components of effective Lasallian citizenship in three areas: knowledge, skills, and attitudes/values through an analysis paper, and
 7. Create a list of doable steps that will enhance their leadership potential.
- b. Student outcomes
- SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Orientation
- Self-Awareness
- Visioning: Goals and Roles
- Etiquette: Proper Lasallian Behavior 1
- Etiquette: Proper Lasallian Behavior 2
- Love Relationships
- Career Awareness
- Career Information
- Basic Citizenship
- Active Citizenship in School
- Leadership
- Leadership Styles
- Integration

Course Name/Course Code: **Personal Effectiveness Formation (PERSEF2)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor:

Textbook and Online Resources:

Various self-assessment surveys and online resources will be used for each of the modules.

Course Information:

- a. Description - The Lasallian Core Curriculum of the DLSU–Manila aims at developing a whole person who embodies the Lasallian values and demonstrates professional skills as well as personal competencies. This individual is mature in all aspects of his/her person, with a nationalistic and humanistic outlook and a carefully reasoned faith.

PERSEF2 is a formative course in the Lasallian Core Curriculum, taken by students in their 2nd or 3rd year, before they take their practicum courses. It focuses on their preparation for entry into the world of work. It is based on the theory that career is a developmental process that starts in childhood and goes on through life. One's career development is thus affected by, and affects, one's physical, socio–psychological, spiritual and cognitive development. The topics of the various sessions revolve around the same 5 themes of total personal development, which were covered in PERSEF1, but take on a different level with emphasis on career development.

- b. Prerequisites/Co-requisites: PERSEF1 (Hard Pre-requisite)
c. Required course

Specific Goals for the Course:

- a. Specific outcomes
1. Determine ways to address the sources of their stressors through stress management activities,
 2. Explain the ethical principles, processes, and factors in making an ethical decision through case discussions,
 3. Discuss tips and share insights on how to improve relationships based on the factors that enforce good relationships,
 4. Prepare oneself as they enter the world of work through a career intervention seminar,
 5. Share thoughts, feelings, and plans of actions on how one can practice social responsibility by living one's individual life responsibly,
 6. Realize their roles in the community and their future professional communities,
 7. Propose feasible measures to promote intercultural sensitivity in one's community distinguish the different concepts related to intercultural sensitivity,
 8. Learn and practice qualities of a situational leader.

b. Student outcomes

SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Orientation
- Self-Management
- Ethics
- Friends and Associates
- Working on Relationships
- Marriage and Family Life
- Career Planning
- Career Preparation
- Social Responsibility
- Roles in the Community
- Cultural Sensitivity
- Situational and Motivational Leadership
- Integration
- Finals

Course Name/Course Code: **Science, Technology, and Society 1 (SOCTEC1)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Ms. Yellowbelle Duaqui

Textbook and Online Resources:

- Casti, J. (1990). *Paradigms lost: tackling the unanswered questions of science*. LA: Harper Perennial.
- Conner, C.D. (2005). *A people's history of science: miners, midwives, and low mechanics*. New York: Nation Books.
- Erasga, D. (2010). When story becomes theory: storytelling as sociological theorizing. *Asia Pacific Social Science Review*, 10 (1): 21-38.
- Gribbin, J. (2002). *The scientists: a history of science told through the lives of its greatest inventors*. New York: Random House.
- Gribbin, J. (2007). *The fellowship: Gilbert, Bacon, Harvey, Wren Newton and the story of scientific revolution*.
- Lewis, C.D. (1956). *The poet's way of knowledge*. Cambridge: Cambridge University Press.
- McGinn, R. (2002). *Science, technology and society*. New Jersey: Prentice hall.
- Morgan, M.H. (2007). *Lost history: the enduring legacy of Muslim scientists, thinkers and artists*. Washington D.C.: National Geographic.
- Moser, W. (1993). Literature: a storehouse of knowledge. *Epistemocritique*, 22:2/3:126-140.
- Neubauer, J. (2003). Reflections on the convergence between literature and science. *MLN*, 118:3: 740-754.
- Roche, M.W. (2004). *Why literature matters in the 21st century*. New Haven: Yale University Press.
- Taylor, C. (1991). *The malaise of modernity*. Concord: Anansi.
- British Broadcasting Corporation. (2010). *The Story of Science. Power, Proof, and Passion*. Retrieved March 7, 2011 from http://en.wikipedia.org/wiki/The_Story_of_Science:_Power,_Proof_and_Passion"

Course Information:

- a. Description - Science, Technology, and Society 1 (SOCTEC1) is a social science course designed for students of the Colleges of Computer Studies, Engineering, and Science. It uses social science perspectives to examine the nature, emergence, and progress of scientific and technological knowledge and practice. The course focuses on the interface between science and technology on the one hand and human society and culture on the other. Specifically, it shows science emerges and develops as a response to the various problems and demands of society and how the practice of science is shaped by the social, cultural, political, and economic aspects of society. To be discussed in the course are current issues about science, technology, and society that are relevant to the students' majors (natural and physical sciences, engineering, and computer science).
- b. Prerequisites/Co-requisites: SOCTEC1 (Code-Shared) SOCSCI1 (Generic)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Articulate various perspectives on the interactions between science, technology, and society; the character, functions, and development of science as these are shaped or informed by the social sciences (sociological, cultural, economic, and political) and environmental aspects of society.
 2. Compose an original insight paper appraising the social nature of S&T vis-à-vis the students' role as future Filipino scientists.
 3. Create a persuasive presentation on scientific and technological explorations as they relate to ethical social practices and their implications on social interactions.
- b. Student outcomes

SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Society vis-à-vis Science and Technology
- Science as Knowledge Production
- Science and Other Forms of Knowledge
- Ethics of Science and Technology
- Science, Technology and Social Stratification

Course Name/Course Code: **Science, Technology and Society 2 (SYSINFO)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor: Robert E. Javier Jr. PhD, RP (ML)

Textbook and Online Resources:

Creswell, John W. (2003) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 2nd Ed. Sage Publications: Thousand Oaks, CA
Garner, Roberta (2000) *Social Theory: Continuity and Confrontation, A Reader*. Broadview Press: Ontario, Canada
Hodson, Randy and Teresa A. Sullivan (2008) *The Social Organization of Work*. Thomson Wadsworth: Belmont, CA

Course Information:

- a. Description - Science, Technology, and Society 2 (SOCTEC2) focuses on the impact of science and technology on society. It examines social institutions and organizations from the macro perspective. Among the issues discussed are the influence and consequences of science and technology on various aspects of society, such as the environment, the economy, modernization and globalization, social and power relations, and governance.
- b. Prerequisites/Co-requisites: OCTEC2 (Code-Shared), SOCTEC1 (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Identify and define concepts about the human personhood and the politico-economic and socio-cultural development processes in relation to the advances in modern science and technology
 - a. Apply the modes of scientific inquiry in the social sciences to examine issues
 2. Discuss the impacts of science and technology on the development processes, social relations and governance
 3. Participate in scholarly discourses in the classroom
 - a. Conduct and present social research in collaboration with classmates
 4. Describe the role of science and technology in governance, particularly in national development and the important policy issues involved in scientific and technological development
 5. Analyze the impacts of science and technology to the human personhood, social institutions and practices and power relations
- b. Student outcomes
SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Theories of Social Development
- Modernization
- State-building
- Capitalism
- Globalization
- Science, Technology and Social Development
- Science, Technology and Governance and Policy

Course Name/Course Code: **Solimen Mensuration (SOLIMEN)**
Credits and Contact Hours: 2 units (2 hours lecture)
Instructor:

Textbook and Online Resources:

- Earnhart, Richard T. (2011). *Solid Mensuration: Understanding the 3-D Space*, C&E Publishing Inc.
- Schneider D., Hornsby, J., Lial, M, Daniels, C. (2014). *Trigonometry (10th Edition)*, Pearson.
- Larson, R. (2010). *Trigonometry, 8th Edition*. Cengage Learning.
- Coburn, J. W. (2008). *Trigonometry*, The McGraw-Hill Companies, Inc.
- Lial, M. L., J. Hornsby, D. I. Schneider. (2005). *Trigonometry*, Addison Wesley.
- Sullivan, M. (2005). *Trigonometry: A Unit Circle Approach, 7th Edition*, Prentice Hall
- Swokowski, E. W. and J. A. Cole. (2002). *Algebra and Trigonometry with Analytic Geometry, 10th Edition*, Brooks/Cole.

Course Information:

- a. Description - Solid Mensuration course also known as Solid Geometry covers the study and measure of plane figures and solids. Topics on the measure of plane figures include concept of lines, planes, and formulas for computing the area of plane figures. Meanwhile, the measure of solids deals with Cavalieri's theorem and the Volume theorem, and the formulas for calculating the surface area (lateral and total surface area) and volume of various solids. This subject will cover solids such as cubes, rectangular parallelepipeds, prisms, cylinders, pyramids, cones, frustums, and spheres. The Theorems of Pappus as method of computing the surface area and the volume of a solid revolution is also included in the course. Students enrolled in the course are expected to relate the concepts and principles discussed to solve various practical engineering and scientific problems.
- b. Prerequisites/Co-requisites: ANAGEOM (Co-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Compute areas and perimeters of regular polygon and common polygons such as triangles, parallelograms, rectangles, square, rhombus, and trapezoids.
 2. Compute areas of circles, sectors, segments, annulus, inscribed and circumscribed polygons, star polygons, elliptical section, parabolic section and composite figures.
 3. Define lines, planes in space and angles.
 4. Define types of solids, surface area and volume of solids in terms of "The Cavalieri's Principle and Volume Theorem."
 5. Explain the concepts of similar figures, similar solids and its properties.

6. Compute volumes and surface areas of solid figures such as cubes, rectangular parallelepiped, prisms and cylinders, pyramids, cones, frustum of cones, frustum of pyramids, spheres, zone spherical segment of one and two base, spherical sector and spherical cone.
7. Solve applied problems using the principles discussed for plane figures as well as solids of revolution.
8. Define Theorems of Pappus and compute for the volume and surface areas of some solids of revolution.

b. Student outcomes

SO-A. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of chemical engineering.

Brief List of Topics to be Covered:

- Mensuration of Plane Figures
- Mensuration of Other Plane Figures
- Polyhedra
- Prisms and Cylinders
- Pyramids and Cones
- Frustums, Truncated Prisms, and Cylinders, Prismatoids
- Sphere

Course Name/Course Code: **Oral Communication / Advanced Speech Class (SPEECOM)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Plata, S., Laurilla, M., Madrunio, M. & Villegas, S. (2006). Keys to making a difference. Laguna: Trailblazer Publications.
- Brown, R. (Producer & Writer), & Wilson, J. (Director & Executive Director). (2006). The basics of how to plan, write and give a winning presentation [video recording]. Chicago, Illinois: J. Wilson and Associates.
- Hasling, R. (2010). The audience, the message, the speaker. Boston: McGraw-Hill.
- Nelson, P., Titsworth, S. , & Pearson, J. (2011). iSpeak: Public speaking for contemporary life. New York: McGraw-Hill.

Course Information:

- a. Description - This course is an English for Specific Purposes (ESP) course that focuses on the production, delivery, and assessment of the following oral presentations: the impromptu, lecture and/or persuasive speech for individual presentation, and the panel discussion for group presentation. The presentations aim at providing students first-hand experiences in public speaking to develop their self-confidence and critical thinking in oral presentations addressing relevant social issues.
- b. Prerequisites/Co-requisites: COMADVE (Equivalent) CORPCOM (Equivalent) ENCOMP2 (Equivalent) ENGLTRI (Equivalent) MODCOMM (Equivalent) ENGLCOM (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Develop analytical and critical thinking with emphasis on inferential and critical listening that will help them expand perspectives, draw themes together, draw conclusions, and orally present organized data consistent with audience expectations
 - 2. Evaluate and reflect on their learning of public speaking skills that arise from invention, organization, composition, and delivery
 - 3. Develop communicative competence in listening and speaking through active inquiry and actual speech delivery
 - 4. Organize ideas for clarity, conciseness, and coherence present speeches confidently and extemporaneously before an audience
 - 5. Utilize speaking and listening skills to accomplish their learning goals and objectives
 - 6. Practice the Lasallian values of intellectual honesty, perseverance, and respect for diverse opinions and ideas as a speaker and audience member

7. Use materials in preparing and delivering speech presentations on an informed personal stand on current social issues
 8. Propose a personal action plan for a specific speech presentation to address a social issue
- b. Student outcomes
- SO-E. An ability to recognize, formulate, and solve problems
- SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Syllabus/Course Introduction
- Introduction to Public Speaking
- Preparing for the first planned speech (Informative or Persuasive) presentation
- Informative /Persuasive Speech
- Impromptu Speech
- Panel Discussion
- Finals

Course Name/Course Code: **Statics of Rigid Bodies (STATICS)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Engineering Mechanics: STATICS (7th Edition), J.L. Meriam & L.G. Kraige, John Wiley & Sons, Inc. 2013
- Engineering Mechanics I (Statics), 1st Ed. Romeo Estanero (Ed), DLSU-Manila, 2002
- Engineering Mechanics: Statics, J. L. Meriam and L.G. Kraige, John Wiley & Sons, Inc., 2006
- Engineering Mechanics (12th Edition), R.C. Hibbeler, Pearson Education South Asia, 2010
- Engineering Mechanics: Statics (3rd Edition), A. Pytel, Cengage Learning, 2010.
- Engineering Mechanics: Statics and Dynamics (2nd Edition), F. Constanzo, McGraw-Hill, 2013.
- Engineering Mechanics, P. N. Chandramouli, PHI Learning Private, 2011.
- Lespérance, S. (2006, September 23). *Tacoma Bridge* [Video File]. Retrieved from <http://www.youtube.com/watch?v=uKeENdyIlul>
- Cockcroft, A. (2010, April 21). *Garage Roof Trusses*. Retrieved from <http://www.youtube.com/watch?v=d7Q-suFmOZ8&feature=related>
- [Man of Steel]. (2009, August 21). *Animation of Steel Through Howe Truss Bridge*. Retrieved from <http://www.youtube.com/watch?v=GKYVEEGjX4E&feature=related>
- Graham, T. (2011, March 23). *Angle of Friction Experiment*. Retrieved from http://www.youtube.com/watch?v=3V6EhZY_dKo&NR=1
- Graham, T. (2011, March 24). *Angle of Friction Second Experiment*. Retrieved from http://www.youtube.com/watch?v=z2q_Wymu0W4&feature=related
- http://www.lboro.ac.uk/faculty/eng/engtlsc/Eng_Mech/tutorials/tut_index.htm
- <http://web.mst.edu/~mecmovie/>

Course Information:

- a. Description - Statics of Rigid Bodies (STATICS) is a branch of Engineering Mechanics that deals with the study of forces and interaction of forces that occur in rigid bodies that are in static equilibrium. In this course, two and three-dimensional structures are analyzed to determine both external and internal effects due to external forces.

Properties of areas and lines (centroids and moment of inertia) which are important parameters in design of structures will also be discussed. An understanding of the fundamental concepts and tools for analyzing forces and moments is essential in mechanics of deformable bodies, structural analysis and design courses.
- b. Prerequisites/Co-requisites: MECAONE (Equivalent), MECHONE (Equivalent), ENGPHY1 (Hard Pre-requisite), INTECAL (Soft Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Identify and determine the components and resultant of forces and force systems in 2D and 3D.
 2. Analyze effects of forces on rigid bodies in static equilibrium using free body diagrams and equations of equilibrium.
 3. Analyze the external and internal effects of forces on structures such as beams, trusses, frames and simple machines.
 4. Analyze the effects of friction forces on rigid bodies in static equilibrium
 5. Solve the properties (centroid, center of gravity and moment of inertia) of areas and lines and apply these properties in equilibrium problems.

- b. Student outcomes
 - SO-A. An ability to apply knowledge of mathematics, physical sciences, engineering sciences to the practice of civil engineering.

Brief List of Topics to be Covered:

- Mechanics, Basic Concepts, Scalars and Vectors, Newton's Laws, Units, Free Body
- Force Systems – Two Dimensional: Definition and Characteristics of a Force, Types of Force Systems, External and Internal Effects, Principle of Transmissibility, Components of a Force, Force Classification (concentrated vs distributed)
- Moment of a Force, Varignon's Theorem
- Resultants of Coplanar Force Systems: Concurrent Force Systems and Parallel Force Systems
- Resultants of Coplanar Force Systems: Nonconcurrent Non-parallel Force Systems
- Equilibrium of Coplanar Force Systems: Free Body Diagrams, Types of Two-Dimensional Supports, Equations of Equilibrium, Equilibrium of Coplanar Concurrent and Parallel Force Systems
- Equilibrium of Coplanar Non-concurrent Nonparallel Force Systems

Course Name/Course Code: **The Christian Vocation to Life (TREDFOR)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Bourg, Florence Caffrey. *Where Two or Three are Gathered: Christian Families as Domestic Churches*. Indiana: Notre Dame Press, 2004.
- D'Antonio, Willam. *Voices of the Faithful: Loyal Catholics striving for Change*. New York: Crossroad Publication, 2007
- De Mesa, Jose. *Marriage is Discipleship*. Quezon City: East Asian Pastoral Institute, 1995.
- Dunlap, Janice. *Purpose, passion and God: Awakening to the deepest meaning of life*. Manila: Logos Publication, 2007
- Garcia de Haro, Ramon. *Marriage and the Family in the Documents of the Magisterium: A Course in the Theology of Marriage*. San Francisco: IgnatiusPress, 1993.
- Gonzales, Andrew F.S.C. *One in the Lord*. Manila: De La Salle University Press, 1994.
- Maguire, Katheryn. *Stress and Coping in Families*. Cambridge: Polity Press, 2012
- Miller, Patricia. *Sex is not a Four Letter Word*. New York: The Cross Road Publishing Company, 1995.
- Porter, J.R. *Jesus Christ: The Jesus of History, the Christ of Faith..* London: Duncan Baird Publishers, 1999.
- Short, Rey E. *Sex, Love or Infatuation: How Can I Really Know?* Manila: Claretians Publications, 2002.
- Stephen, George. *It makes all the difference: Stories of Compassion and Love in Action*. Bandra, Mumbai: St. Pauls, 2009
- Verzosa, Sr.Mary Pilar RGS. *Learning to Live and Love*. Makati: Word and Life Publications, 1996.
- West, Christopher. *Theology of the Body: A Basic Introduction to Pope John Paul's Sexual Revolution*. West Chester: Ascension Press, 2004
- Wood, Susan. *Ordering the Baptismal Priesthood: Theologies of Lay and Ordained Ministry*. Collegeville Minn: Liturgical Press, 2003
- Wostyn, Lode. (ed.) *Living Like Jesus*. Quezon City: Claretian Publications, 2004.
- <http://www.beliefnet.com>
<http://www.smp.org/index.cfm>
<http://www.vatican.va>

Course Information:

- a. Description - The TREDFOR course (The Call of the Kingdom of God and Christian Responses) develops the student the disposition and knowledge in discerning Christian life as a response of faith to the invitation to an unconditional offer of life and love (the Kingdom of God). The course focuses on marriage and family life as a response and commitment to follow Jesus. After exploring God's call as vocation in Module 1, its implication for the marital commitment will be discussed in Modules 2 and 3. The characteristics, relational means of the marital commitment and the meaning of being and becoming family will be treated in module 4. Priesthood, religious life and single life will also be discussed in Module 5 as other ways of responding to God's call.

- b. Prerequisites/Co-requisites: TREDTRI (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Responding to the Lasallian vision-mission by living out Christian perspectives, behavior, attitudes and contributing to the growth of the local church and nation
 2. Participating/leading in their faith celebrations and building of communities in the promotion human dignity, peace, and the preferential option for the poor as well as in advocating care for the earth, good of the nation & the church
 3. Involving and supporting inter-religious dialogue, ecumenism as to respect other perspectives and opinions (faith, religion, culture, orientation) and promoting justice, equality and the common good
 4. Initiating ways to gain new knowledge thru critical discussions, researches, academic forums, and participation in professional organizations and their activities
 5. Participating actively and responding to socio-economic-political, cultural, moral and spiritual issues, concerns, and needs of the people, the community especially the poor/marginalized through living out high-order principles, e.g., compassion, sympathy, forgiveness, mercy, faithfulness, accountability
- b. Student outcomes
 - SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Vocation as an Invitation to Follow God's Call (Kingdom of God)
- Marriage as a Response to God's Call
- Ways and Means for Meaningful and Fruitful Christian Marital Relationship
- Christian Family: the Beginning of the Family of God
- Other Ways of Responding to God's Call

Course Name/Course Code: **Humanity's Search for Life (TREDONE)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Barnes, M. (2004). *Theology and the Dialogue of Religions*. UK: Cambridge University Press.
- Bevans, S. and R. Schroeder (2005). *Constants in context: a theology of mission for Today*. Quezon city: Claretian Publications
- Bradley, G. (2002). *The Meaning of life*. Kansas City: Andrews McMeel Publishing
- Cacho, R. (2008). "Re-articulating soteriology, using ginhawa as model of theology of salvation for Filipinos", in *The Bible in the 21st century Philippine context*. Philippine Bible Society.
- Carroll, John (2004) *Sustainability and Spirituality*. USA: State of New York University Press.
- Edwards, D. (1986). *What are they Saying about Salvation*. New York: Paulist Press
- Flood, G. (2012). *The importance of religion : meaning and action in our strange world*. West Sussex: Wiley-Blackwell, 2012.
- Gonzalez, A. (2002). *Towards an Adult Faith*. Manila: De LaSalle Press.
- Hand, T. (2004). *Always a Pilgrim: Walking the Zen Christian Path*. California: Mercy Center Meditation Program
- Hick, John & Hebblethwaite, Brian. *Christianity And Other Religions: Selected Readings*. USA: Oxford University Press.
- Holder, A. (2005). *The Blackwell Companion to Christian Spirituality*. USA: Blackwell Publishing.
- Kim, S. (2008). *Christian Theology in Asia*. New York: Cambridge University Press.
- Longchar, Wati (2007) *Traditions and Culture of Indigenous Peoples*. Indonesia: Asia Pacific Alliance of YMCAs and Interfaith Cooperation Forum.
- Mallon, E. D. (2006). *Islam: What Catholics Need to Know*. Washington, DC: National Catholic Educational Association
- Netton, I.R., ed. (2010). *Encyclopedia of Islamic Civilization and Religion*. London: Routledge.
- Nye, M. (2008). *Religion: The Basics*. London: Routledge.
- O'Toole, L. (1998). *John Baptist de la Salle, the teacher saint*. Manila: De LaSalle Press
- Perrin, D. (2007). *Studying Christian Spirituality*. New York: Routledge
- Saeed, A. and H. Saeed (2004). *Freedom of religion, apostacy and islam*. Burlington VT: Ashgate
- Smith, Jane (2007). *Muslims, Christians, and the Challenge of Interfaith Dialogue*. Oxford University Press, Inc.
- Tomita, Luiza & Vigil, Jose *Along the Many Paths of God*. USA: Transaction Publishers
- Wostyn, L. ed. (2004). *I believe*. Quezon city: Claretian Publications

Course Information:

- a. Description - The TREDONE course (Humanity's Search for Life) develops students the skills for religious respect and tolerance, dialogue and unity, as they open themselves into inter-religious and ecumenical dialogue. This dialogue and sharing of

spiritual gifts from the great traditions in turn show the way to promoting justice, peace, and integrity of creation.

In this course, the students discern the role that faith plays in their lives as they grapple with the questions and concerns on the meaning of life. As the course looks at the distinctiveness of Christianity and its different faith expressions, students are led to discover and critically appreciate the life-giving roots exemplified in their own beliefs, norms and rituals. They deepen their understanding the meaning life by recognizing the truth, goodness and beauty found in the different religious traditions.

- b. Prerequisites/Co-requisites: None
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 1. Respond to the Lasallian vision-mission as to contribute in the personal, communal, ecclesial, and societal growth and transformation
 2. Appreciate own faith expressions and involve themselves, support, and promote inter-religious dialogue and ecumenism
- b. Student outcomes
 - SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Our search for the meaning of life
- The Christian perspective on the fullness of life
- Witnessing as faith communities
- Inter-religious dialogue in the Philippines
- The wisdom and inspiration from the great faith traditions

Course Name/Course Code: **The Christian and the Word (TREDTRI)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Baukham, Richard. *The Testimony of the Beloved Disciple: Narrative, History and Theology in the Gospel of John*. Chicago: Baker Academic, 1996.
- Bragado, Erlinda and A. Monera. *Kaloob: Interweaving on the Christian Story*. Manila: DLSU University Press, 1999.
- Brown, Raymond, SS, et.al. (Eds.). *The New Jerome Biblical Commentary*. New Jersey: Prentice Hall, 1990.
- Brown, R. (1994). *An Introduction to New Testament Christology*. Manila: St. Paul.
- Brown, R. (2002). *The Community of the Beloved Disciple*. Manila: St. Paul.
- Charpentier, E. (1997). *How to Read the New Testament*. Quezon City: Claretian.
- Chilton, H., gen. ed., (2008). The Cambridge companion to the Bible**. Cambridge: Cambridge University Press.
- Curtis, A., ed. (2009). Oxford Bible atlas**. Oxford: Oxford University Press.
- Duquesne, J. (2010). **Women of the Bible. Translated from the French by David Radzinowicz. Paris: Flammarion.**
- Fee, Gordon D. and D. Stuart. (1993). *How to Read the Bible from All Its Worth*, 2nd Ed. Grand Rapids: Zondervan Publishing.
- Flannery, Austin, OP, ed., (1984). "Dei Verbum," in VATICAN Council II: The Conciliar and Post Conciliar Documents. Pasay City: Paulines Publishing House.
- Dennis G., D. Irarrazaval, and MT Wacker, eds. (2010). The Bible as word of God.** London: SCM Press.
- Gonzales, Andrew FSC. *DLSU Booklet on St. La Salle*. Manila: DLSU Press, 1987.
- Metzger, Bruce & Coogan, Michael, eds. (1993). *The Oxford Companion to the Bible*. New York & Oxford: Oxford University Press.
- Montague, G.T. (2007). **Understanding the Bible: a basic introduction to biblical interpretation**. New York: Paulist Press.
- Moore, S. and F. Segovia. (2005). *Postcolonial Biblical Criticism: Interdisciplinary Intersections*. London & New York: T&T Clark International.
- Moyise, S. (2004). *Introduction to Biblical Studies*, 2nd Edition (London & New York: T&T Clark International.
- Pawson, D. (2007). **Unlocking the Bible: a unique overview of the whole Bible**. London: Collins, 2007.

Course Information:

- a. Description - The TREDTRI course (The Christian and the Word) is a journey into Sacred Scriptures as a locus of encounter with JESUS, THE LIVING WORD. The students read and reflect on the bible as God's revelation or personal communication, develop the skills in biblical analysis and personally reflect on the life of Jesus. The course empowers the students to live and promote the Gospel values of justice, peace and care of creation in their lives and in their communities. Concretely, students immerse into communities in need of help in the catechetical ministry.

- b. Prerequisites/Co-requisites: TREDTWO (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Respond to the Lasallian vision-mission as to contribute in the personal, communal, ecclesial, and societal growth and transformation
 - 2. Appreciate own faith expressions and involve themselves, support, and promote inter-religious dialogue and ecumenism
- b. Student outcomes
 - SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- Frequently asked questions (faqs) about the Bible
- The 3 worlds in understanding the Biblical text
- Jesus the revelation of God: a call to discipleship
- The historical Jesus
- The Christ of faith

Course Name/Course Code: **The Filipino Christian in a Changing World (TREDTWO)**
Credits and Contact Hours: 3 units (3 hours lecture)
Instructor:

Textbook and Online Resources:

- Bretzke, James T. (2004). *A Morally Complex World: Engaging Contemporary Moral Theology*. Liturgical Press.
- Clairmont, D. A. (2011). **Moral struggle and religious ethics : on the person as classic in comparative theological contexts**. Massachusetts: Wiley-Blackwell.
- Curran, Charles. (1966). *Christian Morality Today: The Renewal of Moral Theology*. Notre Dame, Ind: University Notre Dame Press
- Genovisi, Vincent J. (2003). *In Pursuit of Love. Catholic Morality and Human Sexuality (2nd Edition)*. Quezon City: Jesuit Communications Foundation, Inc.
- Gensler, H. J. (2011). **Ethics: a contemporary introduction**. New York: Routledge.
- Gula, Richard. (1999). *The Good life: where Morality and Spirituality converge*. New York: Paulist Press
- Gula, Richard. (1997). *Moral Discernment*. New York: Paulist Press
- Gula, Richard. (1989). *Reason informed by faith; foundations of Catholic Morality*. New York: Paulist Press
- Harrington, Donal (1996). *What is Morality*. Dublin: The Columbia Press
- Hendrickx, Herman. (1988). *Social Justice in the Bible*. Quezon City: Claretian Publication
- Henriot, Peter J. (1989). *Catholic Social Teaching: Our Best Kept Secret*. Quezon City: Claretian Publications
- Hollenbach, David, SJ. (2002). *The Common Good and Christian Ethics*. Cambridge University Press.
- the theme of biblical eschatology and its impact on the ordered life of the emerging Christian communities).
- Ricœur, Paul. (1986), *Fallible Man*, revised trans. Charles E. Kelbley New York: Fordham University Press. This work discusses the three aspects of perspective: cognitive, affective and practical.
- Sher, G., ed. (2012). **Ethics : essential readings in moral theory**. New York: Routledge.
- Singer, P. (2011). **Practical ethics**. Cambridge: Cambridge University Press.
- Spence, E. (2011). **Media, markets, and morals**. West Sussex: Wiley-Blackwell.
- Verhey, Allen. (1984) *The Great Reversal: Ethics and the New Testament (Grand Rapids, Michigan: William B. Eerdmans Publishing Company, (depicts the various ethical traditions/perspectives in the Christian Scriptures (New Testament).*
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<http://www.vatican.va>

Course Information:

- a. Description - The TREDTWO course (The Filipino Christian in a Changing World) develops students as persons in communities of moral discernment. The Filipino-Christian living in a rapidly changing world is confronted with challenges and alternative lifestyles which demand proper discernment, evaluation and decision.

- b. Prerequisites/Co-requisites: TREDONE (Hard Pre-requisite)
- c. Required course

Specific Goals for the Course:

- a. Specific outcomes
 - 1. Respond to the Lasallian vision-mission as to contribute in the personal, communal, ecclesial, and societal growth and transformation
 - 2. Appreciate own faith expressions and involve themselves, support, and promote inter-religious dialogue and ecumenism
- b. Student outcomes
 - SO-G. An ability to effectively communicate orally and in writing using the English language

Brief List of Topics to be Covered:

- The Ethical and Christian Perspectives Identity, Ethical Identity and Reality
- Voices that Dictates my Actions and Interactions: The Moral Landscape
- Conversion and Reconciliation (Pagbabalik-loob) with God, with Others, with Creation
- Becoming Human Together as Christian
- Solidarity with Others especially with the Marginalized and the Exploited and with the Whole of Creation