

# *The NDU Gazette*

*A monthly publication covering decisions taken at the COD meetings*

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*Issue Number One, August 2014*

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## Phone Usage Policy

approved by the UC on February 12, 2014

### Preamble

Notre Dame University (ND) is committed to provide its administrators, faculty & staff members with adequate telephone service, to help them fulfill their work responsibilities. The office of the VP for Administration proposed the following draft of a policy to regulate the usage of telephone services at NDU campuses and facilities.

### Proposed Policy

Based on work needs and requirements, different University members should have different access to different phone services according to the following table:

Users	Land	Mobile	Land	Mobile	International
	Unlimited		10 minutes limit <sup>1</sup>		
President & VPs President's Office manager, Dean, Network Service Specialist, Director of Admission's	OK				Ok
Assistants to the President, Directors, Advisors to the President, Assistant VP, Managers, Chairpersons, and selected Officers and Administrators	Ok				
Full time faculty members, selected staff <sup>2</sup> , Guest house,			OK	OK	
All other members				OK	

All full time faculty and regular staff members have direct incoming phone number, with a voice mail system.

University Officers and Administrators may be provided with access to International lines, based on need and for specific durations, upon the approval of the respective Vice President and in coordination with the VPA. Other specific needs of special phone access by any University member may be met through the existing approval mechanism by concerned Administrators in coordination with the VPA. International phone cards, **for personal use**, are available upon request from the Guest House keeper, for a charge.

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<sup>1</sup> Note that NDU's current software phone system does NOT allow the enforcement of more than one "time limit", therefore, the 7 minutes time limit was agreed upon as a middle ground between the Full Time Faculty Members and different staff members.

<sup>2</sup> Selected staff members are given limited outgoing access to mobile and land lines, after considering the nature of their work.

# Transition Policy of Academic Officers and Administrators

Approved by the UC on May 23, 2014

**Rationale:** The institutionalization of change in administrations and its related procedures may contribute to a university's reputation for academic excellence. Systematic organization of the transition from one administrator to another is a case in point from which NDU can continue to enhance its best practices of institutional productivity and integrity, as well as the dignity and respect of all its members.

**Applies to:** All administrative and academic appointments

**Definition:** In this policy, transition refers to the process of transfer of power to newly appointed officials at NDU from their outgoing counterparts to ensure a seamless passage of authority.

**Policy:** It is the immediate supervisor's responsibility to initiate the transition process. Access to the office, all university-related files, and sufficient information to conduct duties required by the job description should be in place on the date the incumbent is scheduled to take office.

All outgoing administrators (VP Dean, Chair, etc.) must make themselves available to the incoming administrators two weeks before the contract takes effect, that is, during the tenure of the outgoing administrator. Working sessions will be scheduled to hand over files, meet with colleagues, and become acquainted with the requirements of the positions.

## Suggested Transition Process Form

We, the undersigned, declare that the transition process has been concluded in a manner deemed satisfactory by both parties.

The following have been duly transferred:

Office

Office IT system

General Office Record System   
copies)

Office Related Files (hard and soft

Ongoing Projects

Other Items: Please mention in the space provided:

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\_\_\_\_\_  
Signature of Incumbent

\_\_\_\_\_  
Signature of Outgoing Administrator

\_\_\_\_\_  
Position

\_\_\_\_\_  
Position

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

## Code of Ethics

Approved by the UC on May 23, 2014

### **Rationale**

In line with NDU's mission as a Maronite Catholic university and a community of faith, the University is committed to high standards of respect and equity in personal conduct and actions.

## Conflict of Interest

**Applies to:** All members of NDU

**Definition:** Conflict of interest refers to any business or personal relationship that may interfere with carrying out one's responsibilities with utmost objectivity.

### **Policy:**

Upon assuming appointment as an officer, a member of the NDU community or any affiliate should disclose any affiliations or connections that anyone directly or through immediate family members, has and may cause a conflict of interest in the performance of duties. Consequently, individuals shall refrain from participating in all discussion and decision-making processes relating to themselves or one of their affiliations. Failure to declare a conflict of interest may result in disciplinary action.

### **Supervising Relatives or other Personal Relationships**

Certain supervisory relationships can give rise to an actual conflict of interest or the appearance of undue advantage or abuse of power. Such relationships may involve the relatives or people with whom one has a personal relationship. In such cases, and upon the disclosure of the information, the concerned supervisor must evaluate the situation and decide if there is a need to appoint another evaluator. NDU strongly discourages all faculty and staff from engaging in or pursuing non-academic relationships with students whom they are currently supervising, teaching, or advising.

### Exchange of Gifts and Favors

Employees shall neither seek nor accept for themselves or for the benefit of others any gifts, loans, favors, services, or payments from any person or enterprise which does or seeks to do business with or is a competitor of the University. Employees shall not use any University resources for their own or others' personal benefit.

Any claim of non-compliance with this policy should be reported to the immediate supervisor.

## Confidentiality

**Applies to:** All members of NDU

**Definition:** Confidential information refers to sensitive or personal information that may be detrimental to the University, or to one of its members, if it is made public.

### **Policy:**

The University stresses the necessity to respect the right to privacy and confidentiality in all matters related to administrative and academic work. Confidential information includes, but is not restricted to, all personal and private information such as: health records, students' records, salaries, financial information, performance evaluations, and University databases.

If provided with confidential information, University employees must respect this confidentiality and refrain from using it for personal gain. Unauthorized use of confidential information may be considered breach of contract. In serious cases, the University reserves the right to initiate legal proceedings. When in doubt whether or not information is indeed confidential, no information should be disclosed without first obtaining permission from the party involved. Parents or legal guardians of students over the age of 18 whose children are still financially dependent may have access to academic information in the presence of the concerned student.

At the end of one's contract with the University, employees must return any confidential files in any form which refer to the University's private business, and sign an agreement not to use private University information after the end of the contract.

Any claim of a breach of confidentiality should be reported to the immediate supervisor.

## **Non-Discrimination Policy**

**Applies to:** All members of NDU

**Definition:** The definition of discrimination for the purpose of this policy is: any act, on or off campus, or in cyberspace, by any NDU community member (or affiliate) by which an individual is treated less favorably because they have a particular identity.

**Policy:**

No discrimination is tolerated on the basis of gender, race, religion, national or ethnic identity, marital status, disability, sexual orientation, or political affiliation.

Discrimination applies to any inequity regarding all terms and conditions of employment which include, but are not limited to, recruitment, hiring, training, compensation, benefits, promotions, disciplinary actions, and termination of contract. University publications, whether written or visual, must be free of any discriminatory content.

Any claim of discrimination should be brought before one's immediate supervisor and, if necessary, before the University Appeals Committee.

## **Harassment Policy**

**Applies to:** All members of NDU

**Definition:** Harassment may be defined as veiled insinuations, persistent acts of bullying, or attempts to traumatize another, especially when, but not limited to, using one's authority or position of power.

**Policy:**

No form of implicit or explicit harassment will be tolerated by any member of the NDU community, guest, or visitor, whether intentional or unintentional. All members of the NDU community are expected to conduct themselves professionally and to base all interactions on maintaining others' dignity and wellbeing.

Any claims of harassment should be brought to the concerned supervisor.

## **Sexual Harassment Policy**

**Applies to:** All Members of NDU

**Definition:** Sexual harassment is defined as any unwelcome implicit or explicit, verbal or physical sexual advances, and/or requests for sexual favors especially when they create a hostile and intimidating impact on educational performance, employment, or professional development.

**Policy:** NDU is opposed to sexual harassment and will respond firmly with the belief that such behavior goes against the University's mission and values.

#### Response to Sexual Harassment

Claims should be brought before one's immediate supervisor. NDU will endeavor to keep investigation confidential. Reports of sexual harassment must be made within a reasonable amount of time after the event.

#### **Retaliation**

NDU will not condone retaliation against any person making a complaint, assisting another person in the complaint process, or a person investigating the process.

#### **False Complaint**

Any false statement in an investigation, or any false accusation of a student, staff, or faculty member will be considered a serious offense and subject to disciplinary action up to and including termination of contract or expulsion from the University.

#### **Penalties**

Breach of the above policy will be considered a serious offense. Any member of the University community who is found to have engaged in sexual harassment will be subject to disciplinary action up to and including termination of contract or expulsion from the University. See Appendices for suggested procedures.

## **Reporting and Resolving Infractions**

Members of the University who have information concerning any infraction of the policies in this Code of Ethics should report it to the immediate supervisor.

Upon confirming the legitimacy and gravity of the reported infraction, the supervisor shall forward the case to the concerned University officer who shall follow the set procedures of the administrative hierarchy, reaching the President when deemed necessary. The President, based on need, may form an Ad-hoc Ethics Committee to investigate and report its findings and recommendations within three working weeks.

The University will protect its members who report an infraction from any retaliation. Abuse of any of these policies in the form of false complaints or misrepresentation of facts will not be tolerated and may lead to serious disciplinary measures.

## **FBAE – New Major - BS in Economics**

**Approved by the UC on April 7, 2014**

### **1. Rationale**

The Faculty of Business Administration and Economics currently offers a Bachelor in Business Administration degree with various concentrations like Accounting, Banking and Finance, Economics, Financial Engineering, Management and Marketing. The name of the Faculty, however, recognizes that economics is a distinct, though closely related field of study to Business Administration.

In its effort to remain competitive, and to offer economics students better opportunities to pursue their graduate studies in economics, the Faculty decided to introduce the Bachelor of Science degree in economics. The degree allows students to understand, analyze, correlate and compare the different economic conditions of demand, supply, production, cost, consumption, trade and distribution using quantitative and qualitative techniques. This degree is designed to prepare students to the job market and to provide them with the required training that allows them to pursue their graduate studies in economics or in business administration.

### **2. Background and Purpose**

#### **2.1 Mission Statement:**

Consistent with the Faculty mission, the Bachelor of Science in Economics at Notre Dame University-Louaize provides a combination of academic rigor and career preparation. The program emphasizes undergraduate study in a liberal arts education environment. It maintains a high standard of education through a continuously revised curriculum. It prepares students for either future graduate studies or for a variety of careers in the private and public sectors. The program provides students with a challenging educational experience that enhances innovation, competence and sense of social responsibility, while offering an equal chance for all students.

#### **2.2 Program Learning Goals and Outcomes**

By the end of the program graduates will be able to:

##### **Goal 1: General Skills:**

1. use technology and statistical packages to analyze data;
2. employ analytical tools for reasoning and **socially responsible decision making**;
3. apply effective written and oral communication skills;
4. utilize basic research tools to writing reports;

##### **Goal 2: Economics Specific Skills:**

1. understand the principles governing economic decisions;
2. devise economic policies to solve economic issues;
3. use critical thinking in analyzing economic situation;
4. analyze the functioning of the economy in a global environment.

### **3. Intended Entrants**

Following the mission above, the BS in Economics is designed to attract:

- Freshman candidates;
- Sophomore candidates holding the Lebanese Baccalaureate Part II or its equivalent, as determined by the Lebanese Ministry of Education and Higher Education;
- Transfer Students.

#### 4. Admission Requirements

All applicants must satisfy an acknowledged level of English proficiency in order to be admitted. **For more information please refer to appropriate pages in the university catalogue.**

A student may be required to take Math 105 as a remedial course in mathematics if, upon evaluating his/her application, he/she did not accumulate the minimum composite score required by the FBAE.

#### 5. Program General Characteristics

The proposed BS program consists of a total of 90 credit hours (American credits) with the following structure:

CATEGORY	TOTAL CREDITS	PERCENTAGE
General education requirements (GER)	09x3 Cr = 27 Credits	30%
Core requirements	06x3 Cr = 18 Credits	20%
Major requirements	08x3 Cr = 24 Credits	26%
Major elective requirements	05x3 Cr = 15 Credits	17%
Free elective requirements	02x3 Cr = 06 Credits	7%
	<b>TOTAL = 90 Cr</b>	<b>100%</b>

The Program is designed to run over 6 regular semesters. Students are advised to follow the order of course loads and selections as suggested below:

SEMESTER	GER	CORE REQUIREMENTS	MAJOR REQUIREMENTS	MAJOR ELECTIVES	FREE ELECTIVES	TOTAL
FALL I	6 Cr	ACO 201 STA 210	ECN 211	0 Cr	0 Cr	15 Cr
SPRING I	3 Cr	ACO 202 MAT 204 CSC 216	ECN 212	0 Cr	0 Cr	15 Cr
FALL II	6 Cr	BAF 311	ECN 313 ECN 321	0 Cr	0 Cr	15 Cr
SPRING II	6 Cr	0 Cr	ECN 308 ECN 323	3 Cr	0 Cr	15 Cr
FALL III	3 Cr	0 Cr	ECN 314	6 Cr	3 Cr	15 Cr
SPRING III	3 Cr	0 Cr	ECN 450 ECN 482	6 Cr	3 Cr	15 Cr
<b>TOTAL</b>	<b>27 Cr</b>	<b>18 Cr</b>	<b>24 Cr</b>	<b>15 Cr</b>	<b>6 Cr</b>	<b>90 Cr</b>

##### 5.1 General education required courses 27 Cr

The following list shows the General Education Requirements (GER) for students following the BS degree in Economics:

##### A. Communication Skills in English and Arabic 9 Cr.

##### English (6 Cr.)

ENL 213: Sophomore English Rhetoric

**And**

ENL 223: Communication Arts

**Or** ENL 230: English in the Workplace

**Arabic (3 Cr.)** One course from:

ARB 211: Appreciation for Arabic Literature

ARB 212: Advanced Arabic Grammar

ARB 224: Arabic Literature and Human Thought

ARB 231: Technical Arabic

ARB 317: Themes of Modern Arabic Literature in Lebanon (20th century)

**B. Philosophy and Religion 6 Cr.**

**Religion (3 Cr.)**

REG 213: Catholicism

REG 212: Religion and Social Issues

REG 314: Marriage and Family in the Catholic Church

REG 313: The Maronites: Faith and Cultural Heritage

**Philosophy + Ethics (3 Cr.)**

PHL 211: Logic and the Scientific Method

PHL 311: Ethics and the Modern World

POS 345: Ethics and Leadership

ENS 205: Environment, Society and Ethics

**C. Cultural Studies 3 Cr.**

**Cultural Studies**

HUT 305: Human Thought to 1500

HUT 306: Human Thought from 1500 to the Present

MUS 210: Music Appreciation

FAP 215: Art and Culture

ARP 215: Cultural Themes in Lebanese Ach.

COA 359: Media and Society

COA 315: World Cinema Survey

LIR 214: Introduction to Literary Genres

NTR 215: Foods and Nutrition of World Cultures

**D. Citizenship 3 Cr.**

**Political Science**

HIT 211: History of Lebanon and the Middle East

POS 201: Introduction to Political Science

POS 210: Government and Politics in Lebanon

POS 240: Law and Society

POS 319: Democracy and Human Rights

POS 337: Dialogue of Civilizations

IAF 301: Modern Political Ideologies

**E. Science and Technology 6 Cr.**

**Mathematics/Statistics/Computer Science (3 Cr.)**

CSC 201: Computer and Their Use

MAT 201: Fundamentals of Mathematics

MAT 202: Mathematics for Arts

MAT 211: Discrete Mathematics

STA 202: Statistics for Humanities

Natural Sciences (3 cr.)

PHS 211: Principles of Physics

PHS 207: Development of Science and Technology

AST 201: Discovering Astronomy  
 CHM 211: Principles of Chemistry  
 ENS 201: Introduction to Environmental Science  
 ENS 202: Environment and Sustainable Development  
 ENS 206: Ecotourism  
 BIO 202: Mystery of Life  
 BIO 203: Discover Biology  
 HEA 201: Health Awareness  
 NTR 201: Basic Human Nutrition

### 5.2 Core requirements 18 Cr

The required core courses are designed to provide the economics students with the basic technical and quantitative skills. These courses are:

CODE	Cr	COURSE TITLE
ACO 201	3	PRINCIPLES OF ACCOUNTING I
ACO 202	3	PRINCIPLES OF ACCOUNTING II
BAF 311	3	FUNDAMENTALS OF FINANCIAL MANAGEMENT I
CSC 216	3	COMPUTER PROGRAMMING I
MAT 204	3	MATH FOR BUSINESS AND ECONOMICS I
STA 210	3	STATISTICS FOR BUSINESS AND ECONOMICS

### 5.3 Major requirements 24 Cr

There are 24 credits of major required courses that equip students with the required theoretical and quantitative skills. These courses are:

CODE	Cr	COURSE TITLE
ECN 211	3	PRINCIPLES OF MICROECONOMICS
ECN 212	3	PRINCIPLES OF MACROECONOMICS
ECN 308	3	QUANTITATIVE ANALYSIS
ECN 313	3	INTRODUCTION TO ECONOMETRICS
ECN 314	3	APPLIED ECONOMETRICS AND TIME SERIES
ECN 321	3	INTERMEDIATE MICROECONOMIC ANALYSIS
ECN 323	3	INTERMEDIATE MACROECONOMIC ANALYSIS
ECN 450	2	RESEARCH METHODS
ECN 482	1	INTERNSHIP

### 5.4 Major elective courses 15 Cr

Students must select 15 credits of major elective courses that introduce them to different fields in economics. These courses are:

CODE	Cr	COURSE TITLE
ECN 325	3	LABOR ECONOMICS
ECN 327	3	HISTORY OF ECONOMIC THOUGHT
ECN 431	3	INTERNATIONAL ECONOMICS
ECN 432	3	URBAN ECONOMICS
ECN 433	3	GAME THEORY
ECN 434	3	ENVIRONMENTAL AND NATURAL RESOURCE

ECONOMICS		
ECN 435	3	MONETARY THEORY AND POLICY
ECN 436	3	PUBLIC FINANCE AND FISCAL POLICY
ECN 439	3	ECONOMICS OF DEVELOPING COUNTRIES
BAF 315	3	FINANCIAL INSTITUTIONS AND MARKETS

### 5.5 Free elective courses 6 Cr

Students must choose 6 credits offered by any faculty.

## 6 Potential Work Opportunities

Graduates of economics find employment in a wide range of occupations. Their analytical skills and problem solving capabilities are keys to their success in the job market. Holders of economics degrees occupy leading positions in financial, educational, tourism, real estate, insurance, trade and manufacturing sectors. In addition, they often find employment in the public sector as well as at international agencies and NGOs. A study in 2006 at Bentley University Massachusetts-USA found that economics graduates occupy more CEO positions than any other specialization.

## 7 Course Description

### ***ECN 211 Principles of Microeconomics (3.0); 3 Cr.***

This course is an introductory course that teaches the fundamentals of microeconomics. It analyzes the behavior and decision making of individuals in the market economy. Topics include demand and supply, elasticity, consumer theory, the theory of the firm, price and output determination under different market conditions; and pricing of factors of production. *The passing grade for FBAE students is "C".*

### ***ECN 212 Principles of Macroeconomics (3.0); 3 Cr.***

This course is an introductory course to basic macroeconomic principles. It analyzes the functioning of the economy as a whole. It studies the functioning of real and money markets and analyzes equilibrium conditions in each market. The course emphasizes the role of government policies on economic growth, inflation and unemployment. Topics include national income accounts, inflation, unemployment, fiscal policy and monetary policy. *The passing grade for FBAE students is "C".*

### ***ECN 308 Quantitative Techniques (3.0); 3 Cr.***

This course aims to enhance students' quantitative skills and allows them to use those skills to sharpen their understanding of economics. Students will learn how to tackle economic problems using quantitative frameworks. As such, students are expected to be able to interpret the economic concepts and findings behind their results. Topics include: optimization techniques with single constraints, optimization techniques with multiple constraints, dynamic analysis, strategic behaviors of duopolies and intertemporal analysis. *Pre-requisites ECN 211, ECN 212, MAT 204 and STA 210*

### ***ECN 313 Introduction to Econometrics (3.0); 3 Cr.***

This course uses statistical tools to analyze economic data. Topics include basic data analysis, simple and multiple regressions, remedies for violations of the classical regression model assumptions like autocorrelation and heteroskedasticity. *Pre-requisites ECN 211, ECN 212, MAT 204 and STA 210*

**ECN 314 Applied Econometrics and Time Series (3.0); 3 Cr.**

This course provides students with a comprehensive treatment of econometric techniques applied in time series models. The course stresses on application and econometric theory. This course introduces students to many topics in Time Series including stationary and non-stationary time series models, the difference between deterministic and stochastic trend, and the estimation and elimination of trend notation. Students will also learn univariate time series models (AR, MA, ARMA, ARIMA and Seasonal ARIMA models). They will also learn the Box and Jenkins forecasting methodology. The course also covers the concept of Granger causality and the estimation of Multivariate models (Vector Autoregressive models). An interactive econometric software package is used (Eviews). *Pre-requisite: ECN313*

**ECN 321 Intermediate Microeconomics (3.0); 3 Cr.**

This course studies and analyzes the decisions made by households, firms, employees and policy makers and how their decisions affect markets, in partial and general equilibrium frameworks. It combines the intuitive, graphical and mathematical tools of analysis to explain economic decisions. Topics include consumer choice, pricing and output strategies under the four market structures. *Pre-requisites ECN 211 and MAT 204*

**ECN 323 Intermediate Macroeconomics (3.0); 3 Cr.**

This course covers the main topics of macroeconomics. It analyzes the forces of the market and the determinants of the general level of output, prices, and employment. It also tackles the relationship between economic growth and business cycle fluctuations. Finally, it studies the policies needed to achieve full employment and price stability. Topics cover the Classical, Keynesian and new classical models of the macroeconomy, growth theory, the roles of fiscal and monetary policies in the short run and long run, in closed and open economies. *Pre-requisites ECN 212 and MAT 204*

**ECN 325 Labor Economics (3.0); 3 Cr.**

The course is an analytical study of the labor market. It uses microeconomic theory to explain the functioning and the dynamics of labor supply and demand. It examines labor mobility, productivity, wage determination, the decisions of prospective and present labor market participants, and the roles of public policies and labor unions relating to the employment and payment of labor resources. *Pre-requisites ECN 212 and ECN 321*

**ECN 327 History of Economic Thoughts (3.0); 3 Cr.**

A study of origins and development of economic thought from mercantilism to present. The course emphasizes ‘thought’ rather than history. It covers carefully economic reasoning of great and influential economists that led into modern economic analysis. Topics include mercantilism, physiocrats, Adam Smith, David Ricardo, Robert Malthus, pre Marxian socialists, John Stuart Mill, Karl Marx, Austrian economists, Alfred Marshall and John Maynard Keynes. *Pre-requisites ECN 211 and ECN 212*

**ECN 431 International Economics (3.0); 3 Cr.**

This course gives students the opportunity to understand the different theories and to critically assess the different perspectives on international trade and finance. Topics include absolute and comparative advantage, Heckscher-Ohlin theory, new theories of trade, gains from trade, barriers to trade, balance of payments and adjustment mechanisms, the effects of economic policies under different exchange rate regimes and regional integration. *Pre-requisites ECN 211 and ECN 212*

**ECN 432 Urban Economics (3.0); 3 Cr.**

This course explores the economics of cities. It differs from other economics fields as it introduces space and geography into economic analysis. While economics answers the questions of what, how and for whom to produce, Urban Economics adds the “where” to produce and “where” to locate. So, location theory is at the heart of urban Economics. Topics include reasons for the development of cities, market forces in the development of cities, urban economic growth, land rent and land use, zoning, causes of poverty and public policy, housing problems and policy, education and crime. *Pre-requisites ECN 321*

**ECN 433 Game Theory (3.0); 3 Cr.**

This course allows students to represent economic situations as games and to analyze them using different equilibrium concepts. Topics include Nash equilibrium, Cournot Competition, dominant and mixed

strategies, simultaneous games of incomplete information and sequential games of incomplete information.  
*Pre-requisites: ECN 313 and ECN 321*

**ECN 434 Environmental and Natural Resource Economics (3.0); 3 Cr.**

This course develops an in-depth understanding of environmental and resource economics. The course covers topics in environmental, resource, and ecological economics, with a focus on the sustainability of human-economic activities and their impact on the natural environment and economic valuation of environmental issues and development policies. The course covers both traditional neoclassical economic models and recent extensions in the areas of behavioral and ecological economics. The focus will be on international issues with important environmental implications that have become prominent on the environmental policy agenda recently; particularly biodiversity loss and climate change. Besides examining global environmental issues, the course links global environmental problems with that of Lebanon's environmental situation. *Pre-requisites ECN 321*

**ECN 435 Monetary Theory and Policy (3.0); 3 Cr.**

This course studies the effect of monetary variables on the economy. It emphasizes the role of the central bank in shaping economic conditions. Topics include demand and supply for money, nature of the Monetarist-Keynesian debate, the banking system, the transmission mechanism of monetary policy, theories of nominal rigidities and the Phillips curve, and coordination between monetary and fiscal policies. *Pre-requisites ECN 323*

**ECN 436 Public Finance and Fiscal Policy (3.0); 3 Cr.**

This course examines the economics of the public sector. It has two broad topics: government expenditures and revenues. The course thoroughly examines the efficiency/equity trade-off of government policies. Topics include: market failures and optimal taxation, cost/benefit analysis of government projects, income redistribution and poverty programs, political economy and voting the economics of local governments, tax systems. *Pre-requisite: ECN 212 and ECN 321*

**ECN 439 Economics of Developing Countries (3.0); 3 Cr.**

The course focuses on development issues in the context of third world problems such as poverty, illiteracy, urbanization and unemployment. It presents abstract models and then applies them to real world cases. It is a policy oriented course that aims to enhance students' abilities to understand third world problems and to reach policy conclusions about possible solutions. Topics include meaning of underdevelopment; historical patterns of economic change in the developing countries; population problems; obstacles to development; role of industry and agriculture; inequality of income and wealth distribution; economic planning; environmental problems linked to development. *Pre-requisites: ECN 212; and ECN 321*

**ECN 450 Research Methods (2.0); 2 Cr.**

This course is designed to introduce students to research in a broad area of economics and to prepare students to undertake their own research projects. Since this is a senior standing course, it is designed to apply the basic microeconomics and macroeconomics theory developed in introductory and intermediate theory courses to the analysis of contemporary policy issues. The course requires students to a project proposal paper that satisfies both the writing and the theory prerequisite requirements for economics. Students will learn in this course to apply effective writing and oral communication skills to the analysis of international or national economic problems. *Pre-requisites: ECN 313, ECN 314 Senior standing*

**ECN 482 Internship (1.0); 1 Cr.**

This course provides students with an opportunity to balance their classroom experience with work experience. Students will have the opportunity to develop new and practical skills by working under the direction and supervision of an experienced practitioner. The internship will be done in cooperating and department approved firms. A minimum of 150 hours of internship is required. *Pre-requisite: Senior Standing.*

# **FBAE – New Major MS Business Strategy**

**Approved by the UC on April 7, 2014**

## **1. Background and Purpose**

Recent years have witnessed an increasing interest in MS degrees. Many programs related to business studies have been developed and launched, particularly in the areas of Finance (AUB's MS Finance and UOB's MS Accounting & Finance – both in Fall 2012) and Human Resources (AUB's MS HRM). This tendency springs from the fact that these programs help to create and sustain a competitive edge in the marketplace through differentiation and growth. Since none of the local Universities has a MS in Business Strategy, and in view of the high demand for such, the Faculty of Business Administration and Economics (FBAE) at Notre Dame University-Louaize has decided to venture in that direction through the introduction of a MS in Business Strategy alongside the MS in Financial Risk Management (FRM).

The program is designed in such a way as to fulfill a range of purposes that reflect both the ambitions of students and the needs of this particular discipline. Much emphasis is placed on learning outcomes and the expected qualities and skills of the graduates.

### **Mission**

The MS in Business Strategy at Notre Dame University-Louaize aims at providing aspiring candidates with a set of professional and technical skills allowing them to incorporate a strategic perspective in their business processes and solidly advance in their chosen pathway, be it further studies or employment.

## **2. Intended Entrants and Admission Requirements**

Following the mission above, the MS in Business Strategy is designed to attract:

- Business professionals preparing themselves for advancement in their careers.
- Fresh graduates of business and other faculties preparing themselves to jump-start a career in management.
- Professionals and fresh graduates aspiring to pursue doctoral studies in Business Strategy, or any other subject linked to the discipline.
- Professionals and graduates of other faculties contemplating a move into the world of business and management.

The requirements for entry into the MS in Business Strategy program are:

### **Business And Economics Graduates**

- An application form duly completed.
- Two recommendation letters, one of which is from a university professor.
- A GPA of 3.0/4.0 or its equivalent at the undergraduate level (regular admission). Applicants whose GPAs fall slightly below the required level could be admitted subject to approval of the admissions committee, based on a thorough examination of applications.

### **Other Discipline Graduates**

As above, in addition to 18 credits of relevant business courses including foundation courses: ACO 501: Fundamentals of Financial Accounting (1Cr) and FIN 501: Fundamentals of Finance (2Cr).

PS. It is presumed that all business/economics or other disciplines students have already taken courses in statistics and/or quantitative methods.

### **Credit Transfer And Work Experience**

Up to 6 relevant master's level credits can be transferred from other relevant master programs including (list not exhaustive):

- MS, MA, MPhil and MRes (or equivalent) programs in Business, Economics or other disciplines
- MBA (with or without concentration)

### **3. Program General Characteristics**

The proposed MS program is predominantly composed of structured learning opportunities (taught elements) and discipline-related research components. It consists of a total of 30 credit hours (American credits) having the following structure:

<b>CATEGORY</b>	<b>TOTAL CREDITS</b>	<b>PERCENTAGE</b>
MAJOR CORE COURSES	4X3 Cr = 12 Cr	40%
CAPSTONE COURSE	1X3 Cr = 03 Cr	10%
MAJOR ELECTIVE COURSES	2X3Cr = 06 Cr	20%
RESEARCH COMPONENT	1X3 Cr + 1X6 Cr = 09 Cr	30%
	<b>TOTAL = 30 Cr</b>	<b>100%</b>

#### **3.1. Major Core Courses**

As detailed above, there are four Major Core courses:

<b>CODE</b>	<b>TITLE</b>
MBS 610	Modern Corporate Management
MBS 620	Marketing Strategy
MBS 630	Strategic Financial Analysis
MBS 640	Strategic Operations Management

#### **3.2. Capstone Course**

Business Policy (MBS 660) is a capstone course that utilizes the collective knowledge in the different functional areas in business such as accounting, finance, marketing, management, economics and operations management to equip the students with the necessary skills they require in crafting and implementing the strategic plan.

#### **3.3. Major Elective Courses**

The choice of the Major Elective courses will depend on student interest; two courses from the following pool must be chosen:

<b>CODE</b>	<b>TITLE</b>
MBS 615	Strategic Marketing Communications
MBS 625	Corporate Governance
MBS 635	Strategic Brand Management
MBS 645	Entrepreneurship

#### **3.4. Research Component**

BUS 668 Research Methodology for Business is a course that introduces students to quantitative and qualitative research methods. This is followed by BUS 690 MS Thesis,

the final phase of the MS program which consists of writing a structured Master's research thesis based on an approved research proposal. Rules governing the procedures and the management of the MS Thesis are provided in a separate document that is available at the Graduate Division.

#### 4. Delivery and Assessment Modes

The proposed MS Program is supported by integrated teaching, learning and assessment strategies that demonstrate the appropriateness of the learning, teaching and assessment methods used in relation to the intended learning outcomes being developed. The program's knowledge base and skills are delivered through lectures, seminars, hands-on activities, case studies and the use of academic and professional electronic databases, whereas assessment methods used in this program include written examinations, case studies, reports, individual and group essay assignments, oral presentations and a thesis. The following framework is adopted:

<b>Attribute</b>	<b>Teaching/Learning</b>	<b>Assessment</b>
Knowledge and understanding of Business Strategy and research concepts	Lectures supported by directed study of textbooks and journals articles	Written examination and project group work
Analysis, synthesis, and problem solving	Individual and group projects, problem-solving sessions, case study work, and computer laboratory sessions	Written examination, case studies reports and other individual/group projects reports
Transferable key skills in particular communication and team work	Individual and group projects, essays and MS Thesis coaching	Oral presentations, group work projects and MS Thesis defense

#### 5. Qualification Descriptor

The orientation of the proposed MS in Business Strategy program is clearly directed towards Business Strategy. Moreover, the structure of the proposed MS program is explicitly linked to market needs of strategy development in the field of corporate management encompassing the role of small business, entrepreneurship, as well as product development and diffusion. By (1) enabling students to focus on particular aspects of strategic management in which they have prior knowledge or experience, whether through previous study or employment; and (2) by enabling students to learn how to conduct relevant research in Business Strategy related disciplines; and (3) by enabling students to undertake a research project on a topic within the area of interest that makes up a significant portion of the overall assessment – the MS in Business Strategy seeks to:

- Provide students with conceptual and practical knowledge in the field of strategy.
- Develop students' analytical skills enabling them to interpret business data with the aim of enhancing decision-making capabilities.
- Equip students to enter doctoral studies or to pursue the relevant professional certification (i.e. Certified Manager (CM) or Association of Strategic planning's Strategic Management Professional (SMP)).

##### 5.1. Characteristics of Graduates

Informed by (1) The Framework of Qualifications of the European Higher Education Area, and (2) The British QAA Master's Degree Characteristics, the proposed MS Business Strategy program seeks to prepare graduates who are capable of demonstrating a systematic understanding of knowledge, much of which is at, or informed by, the forefront of the strategic planning

research and professional practice in corporate management. Moreover, graduates should be capable of demonstrating originality in their application of that knowledge and in addressing problems. They will have demonstrated a comprehensive understanding of the techniques applicable to their own research. In relation to employment, the MS Business Strategy graduates will be expected to possess the skills needed to exercise independent learning and to develop new skills to a high level.

5.1.1. Subject-general attributes

*The program aims to:*

- Provide the students with a comprehensive knowledge in management.
- Encourage a diverse body of candidates to embark on an evolving learning experience by facilitating an interactive learning process.
- Build on previously acquired learning from undergraduate or graduate degrees.
- Add value to the learning experience of the student by providing relevant and practical applications that reflect the needs by small and large organizations in the market.
- Develop in the students the ability to critically handle complex management issues in a systematic and creative way.
- Prepare graduates for a career in strategic management.
- Instill in the students the knowledge, skills and confidence to become an effective manager, by developing in the students a desire for excellence, a visionary and positive approach to future developments and openness to new ideas

5.1.2. Subject-specific attributes

*Upon successful completion of this program, students should be able to demonstrate knowledge and understanding of:*

- The relationship between organizations, their external context and their management process
- The body of knowledge relating to organizations, their external context and their management process
- The concepts, methods, processes, management and institutions involved in marketing goods and services
- How to make informed judgments about the appropriate application of theory to managerial practice in relation to organizations, their external context and their management process
- Ways to evaluate and recommend options for the improvement of managerial practice in relation to organizations, their external context and their management process
- How to use methodological tools and apply academic research literature in management research.
- How to develop customer-orientated business strategies, and create long-term customer relationships in an economically and ethically sustainable fashion

5.1.3. Generic attributes

- Use initiative and take responsibility
- Solve problems in creative and innovative ways
- Make decisions in challenging situations
- Communicate effectively, with colleagues and a wider audience, in a variety of media.

## 5.2. MS in Business Strategy Award

The degree of MS in Business Strategy is awarded to students who fulfill the requirements of the program as stipulated by the Faculty of Business Administration and Economics. Graduates should have a cumulative GPA of 80% and pass individual courses with a grade not lower than 70%.

## 6. Course Outline

### FOUNDATION COURSES (NON-BUSINESS, NON-ECONOMICS GRADUATES)

#### **ACO 501 Fundamentals of Financial Accounting (1 cr.)**

##### Course Description

This course covers areas in financial accounting and aims at providing students with the basic accounting fundamentals enabling them to understand financial statements that are of concern to managers. Topics in accounting include but not limited to the accounting equation, the balance sheet, the income statement, and the statement of cash flow.

##### Topics:

The Accounting Environment  
The Accounting Equation  
The Trial Balance  
The Balance Sheet  
The Income Statement  
The Cash Flow Statement

#### **FIN 501 Fundamentals of Finance (2 cr.)**

##### Course Description

This course covers areas in managerial finance and aims at providing students with the basic finance fundamentals enabling them to deal with issues in finance that are of concern to managers. Topics in finance cover the time value of money, risk and return, and securities valuation.

##### Topics:

The Finance Function  
Time Value of Money  
Risk and Return  
Stock Valuation  
Bond Valuation  
Capital Asset Pricing Model  
Cost of Capital  
Dividend Policy

### **Major Core Courses – Twelve Credits**

#### **MBS 610 Modern Corporate Management (3 cr.)**

##### Course Description

This course aims to provide candidates with a broad theoretical and practical understanding of some key concepts in modern corporate management. To achieve this aim, it looks at these concepts from three separate but interrelated lenses: organizational theory, organizational behavior, and human resource

management. Topics include but not limited to organizational structure design, organizational change and development, leadership in organizations, motivation, recruitment and selection, and training and development.

Topics:

The Role of The Manager  
Ethical, Sustainable Management and Corporate Social Responsibility  
Leadership  
Team Building and Management  
Managing Conflicts  
Negotiation Skills  
Motivation and Employees Satisfaction  
Employment Planning and Recruiting  
Training and Development  
Organizational Structure Design  
Organizational Change  
Entrepreneurship/Small Business Management

**MBS 620      Marketing Strategy (3 cr.)**

Course Description

The focus of this course is strategic marketing analysis and marketing planning. Students will study the components and construction of a strategic marketing plan, and they will learn to analyze complex marketing situations/decisions. Current cases will be used. This course will also review trends in marketing including the integration of marketing communications, customer relationship management, global markets, the impact of e-commerce and the expanding organizational role of marketing.

Topics:

Internal Analysis  
External Analysis  
Analysis Competitive Situation  
Assessing and Calculating Market Potential  
Strategy Formulation  
Financial & Marketing Evaluation

**MBS 630      Strategic Financial Analysis (3 cr.)**

Course Description

This course provides the students with a systematic framework for using financial statements in business analyses, equipping students with the finance skills to make strategic finance and business decisions. Students will learn to interpret financial information and value opportunities in order to make good decisions regarding ongoing business performance, choosing between project investment alternatives, resource allocation, company valuations and company capital structures.

Topics:

Accounting Analysis: Understanding Revenue and Expense Manipulation  
Statement of Cash Flows  
Common Size Statements and Percentage Changes  
Profitability Analysis  
Ratio Analysis – Profit Margins and Asset Turnovers  
Ratio Analysis – the DuPont Model and Beyond  
Risk Analysis  
Forecasting Financial Statements

**MBS 640 Strategic Operations Management (3 cr.)**

Course Description

Operations management is critical to ensure a smooth running of the supply chain and to deliver value to customers and the business as a whole within its overall strategy. This course examines the different frameworks for designing, diagnosing and improving operations and thereby, contributing in creating and sustaining a competitive edge in the workplace. Topics include but not limited to operations design, capacity planning and control, scheduling, supply chain logistics, and quality control and continuous improvement.

Topics:

Operations Design  
Inventory Management  
Capacity Planning  
Layout Strategies  
Forecasting Techniques  
Scheduling  
Just in Time  
Lean operations  
Service Management  
Linear Programming  
Quality Control and Process Management

**Capstone Course – Three Credits**

**MBS 660 Business Policy (3 cr.) – 18 credits should be completed**

Course Description

This is a capstone course integrating the various concepts and skills taught in the other business courses. It focuses on strategic planning and business policy formulation and implementation. Strategic Planning is viewed as the process by which an organization maintains its competitiveness within its work environment by determining its present business position, where it wants to go, and how it wishes to get there. This is done by identifying business resources and competitive capabilities, and directs these resources towards gaining sustainable competitive advantages. The course treats also modern strategic perspectives such as global strategic planning, corporate governance and sustainable strategies, strategic games and business thinking.

Topics:

The Strategic Planning Process  
External Strategic Audit  
Internal Strategic Audit  
Strategic Choice Options  
Strategy Implementation  
Strategy Control and Evaluation  
Global Strategic Planning  
Strategic Planning for The Not-for-Profit Organizations  
Corporate Social Responsibility and Sustainable Strategies  
Games of Strategy  
Business Thinking

**Major Elective Courses – six Credits (Select Two Courses from the Following List)**

**MBS 615 Strategic Marketing Communications (3 cr.)**

Course Description

Strategic Marketing communications tackles an area of growing importance in strategic management that of developing and managing an integrated marketing communications plan aligned with the corporate, business and functional strategies of an organization. The aim of this course is to go beyond the tactics of marketing communications to incorporate the long-term strategy into an overall program that efficiently meets the business and marketing objectives of the firm.

Topics:

Nature and history of marketing communications  
Communications process and the marketing mix  
Understanding Consumers  
Corporate, marketing and communication hierarchy  
Strategic communications language  
Marketing communications plans  
Marketing communications integration  
Internet and on-line strategies  
Marketing Campaigns  
Branding issues

**MBS 625 Corporate Governance (3 cr.)**

Course Description

Corporate governance is a topic of increasing importance in strategic management. The aim of this course is to build a critical understanding of corporate governance. To this end, we will examine the mechanisms and control systems of an enterprise that will ensure that it pursues its strategic goals successfully and legally. We will explore the governance structure including the internal and external monitoring systems as well as the independent auditing while emphasizing on ethics, transparency and the social responsibility.

Topics:

Compensation, Equity Ownership, Incentives, and the Labor Market for CEOs  
Optimal Board Structure, Tradeoffs, and Consequences  
Governance, Organizational Strategy, Business Models, and Risk Management  
Succession Planning  
Financial Reporting and External Audit  
The Market for Corporate Control  
Roles of Institutional and Activist Shareholders  
Integrity and Ethical Behavior  
Corporate Social Responsibility

**MBS 635 Strategic Brand Management (3 cr.)**

Some of a firm's most valuable assets are the brands that it has invested in and developed over time. This course provides students with insights into how profitable brand strategies can be created. It addresses three important questions. How do you build brand equity? How can brand equity be measured? How do you capitalize on brand equity to expand your business? The course content has relevance to students pursuing a variety of different career goals in virtually any type of organization (public or private, large or small, etc.).

Topics:

Brands and brand Management  
Identifying and Establishing Brand Positioning and Values

Planning and Implementing Brand Marketing Programs  
Measuring and Interpreting Brand Performance  
Growing and Sustaining Brand Equity

**MBS 645**

**Entrepreneurship (3 cr.)**

Course Description

This course examines the peculiar attitude, skills and behavior needed for successful launching of new ventures and managing of small businesses, the backbone of modern economies. Aimed for those with a desire to become entrepreneurs, work in start-ups, or develop careers in consultancy, venture capitals and investment banking, the course studies the best practices that foster innovation and new business development in independent or corporate settings. Referring extensively to business case examples and the experience of creative guest speakers, students will conduct analyses of new venture ideas and comprehensive transformation business plans.

Topics:

Traits and Qualities of Entrepreneurs  
Characteristics of Small and Start-up Businesses  
Concept and New Product Development  
Time to Market  
Technology-based Innovations  
Managing Strategic Change and Transformations  
Mistakes and Best Practices in Entrepreneurship  
Small Business Organization and Management  
Functional Management Considerations in Small Businesses  
Business Plan Development and Communication  
Venture and Small Business Culture  
Joint Ventures and Alliances  
Social Responsibility in Innovations

**Research Component – Nine Credits**

**BUS 668**

**Research Methodology for Business (3 cr.) – 18 credits should be completed**

Course Description

This course views research as a strategic activity that occurs within the context of limited resources and within a framework of ethical, legal, and social constraints. It is at a graduate level in the theory and practice of social science research as applied to business problems. The focus is on available research strategies and methods and their application to the development of a formal research design leading to successful implementation of research projects. Candidates will also be introduced to the conventions of reporting research and receive guidance in relation to the structure and format of their graduate reports and theses.

Topics:

Philosophical Background  
The Scientific Method  
Ethics in Research  
Elements of a Research Study  
Measures and Scales  
The Literature Review and Critique  
Positivist versus Phenomenological Research  
Research Strategies (Surveys, Case Studies, Experiments and Action Research)  
Research Methodologies (Questionnaires, Interviews, Focus Groups, Content Analysis and Observation)

Threats to Reliability and Validity  
Assumptions for Quantitative Analysis

**BUS 690**

**Thesis (6 cr.) – Prerequisite BUS 668 and co-requisite MBS 660**

A MS Thesis is a significant contribution to knowledge which shows a critical appreciation of existing knowledge in the field. The work must be communicated coherently in a thesis presented in a critical, literary and orderly way, and must show evidence of adequate analysis and discussion of results. This is an individual work. Faculty members with expertise in the research field can act as supervisors. Students produce a structured report based on a research proposal that was submitted earlier to the Graduate Division within four weeks from the time of registration.

**7. Contract Sheet**

Below is the contract sheet of the MS in Business Strategy program:

**Master of Science Degree in Business Strategy – 30 cr.  
Contract Sheet**

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**I. Foundation Courses (unearned 3 Cr.)**

ACO	501	Fundamentals of Financial Accounting	1 cr.
FIN	501	Fundamentals of Finance	2 cr.

**II. Major Core Courses (12 Cr.)**

MBS	610	Modern Corporate Management	3 cr.
MBS	620	Marketing Strategy	3 cr.
MBS	630	Strategic Financial Analysis	3 cr.
MBS	640	Strategic Operations Management	3 cr.

**III. Capstone Course (3 Cr.)**

MBS	660	Business Policy (18 cr. should be completed)	3 cr.
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**IV. Major Elective Courses (6 Cr.) – Select 2 courses from the following list**

MBS	615	Strategic Marketing Communications	3 cr.
MBS	625	Corporate Governance	3 cr.
MBS	635	Strategic Brand Management	3 cr.
MBS	645	Entrepreneurship	3 cr.

**V. Research Component (9 Cr.)**

BUS	668	Research Methodology for Business (18 cr. should be completed)	3 cr.
BUS	690	Thesis (Prerequisite BUS 668 and co-requisite MBS 660)	6 cr.

## **FBAE – MBA new emphasis Project Management**

### **Minutes: University Curriculum Committee**

Pierre Abu Khatteer Meeting Room

Wednesday, March 12, 2014

Present: Chahine Ghais; Simon Abou Jawdeh; Ramez Maalouf; Naim Salem; Caroline Akhras; Maria Bou Zeid; Nadim Matta; Lea Eid; and Leslie Hage

Excused: Ghassan Kraidy, Jessy El Hayek, and Jennifer S. El Hajj

The UCC was called to order by Mr. Nadim Matta at 12:05 p.m. on Wednesday March 12, 2014.

1. Approval of Minutes
  - The UCC approved the amended March 5 Minutes.
2. FBAE Proposal
  - **The UCC unanimously approved the proposed emphasis in the MBA stream of Project Management. The three courses were discussed.** Mr. Simon Abou Jawdeh insisted that these new courses be numbered in a manner to reflect sequence as well open up the possibility for additional PM courses in the future.

Following are the new courses for the PM emphasis:

#### **PRM625 Project Management Fundamentals**

This course will provide the students with a deep understanding of the fundamentals of project management. It covers mainly the process and framework of project management. The topics will include scope management, time management and cost management as well as the scheduling and the concept of earned value. This course will also tackle the role of the project manager in initiating, planning, executing, monitoring and closing projects.

#### **PRM635 Quality and Risk Management**

More than half of global business projects fail. This failure can be due to different reasons and it is key for organizations to understand the most common causes in order to improve chances of success. This course is designed around project failures, contingency plans and projects recovery as well as the human resources management in the midst of it. PRM635 applies quality control techniques and risk management concepts to projects to improve their success rate. Topics include quality planning, quality assurance, quality control, continuous improvement, risk identification, qualitative analysis, quantitative analysis, response planning, monitoring & control, and proactive planning.

#### **PRM645 Processes Integration and Project Management**

This capstone course integrates the five processes that define project management. It covers the phases of initiation, planning, execution, monitoring and closeout and links them to the nine areas of knowledge in project management, being the integration, scope, time, cost, quality, human resources, communication, risk and procurement. Moreover, this course focuses on project communication, procurement and stakeholder management to provide the student with an in-depth understanding of the project structure and the management of its external environment.

## **Bachelor of Engineering in Chemical Engineering (BECHE) and Bachelor of Engineering in Petroleum Engineering (BEPE)**

approved by the UC on March 7, 2014

### ***Chemical Engineering***

The scope of the industry in Lebanon is limited by comparison with advanced countries whose industries constitute the major part of their economy. However, despite the fact that a heavy industry in Lebanon is non-existent and will remain so for some time to come, Lebanon's attempt at establishing a small industrial infrastructure or a "light" industry has been successful. By a "light" industry, we mean an industry based, mainly, on the manufacture of unsophisticated consumer products which include cleaning detergent, plastic and paper products in addition to water and food processing. The state of the industry in Lebanon today is such that the nation supplies its own market, as well as the surrounding region, with items of its own design and production. Thus, the process from conception to design and then production of items such as plastic bottles and cups, plastic utensils, plastic packaging and all sorts of paper products require a chemical treatment from beginning to end and for this to happen, the appropriate machines, tools and instruments need to be calibrated, modified, maintained or even designed. In this respect, the Lebanese industry would be in need of chemical engineers knowledgeable in polymer science, chemical processes, disposal of chemical waste and wastewater treatment, bleaching, polishing, material processing and the manufacturing of pharmaceutical products. The steady absorption of our own graduates, mainly in mechanical engineering and in computer and electrical engineering, to fill the need of Lebanese and regional companies that specialize in chemical engineering or in related fields constitutes a supporting evidence to the necessity of establishing a chemical engineering program at NDU to keep up with the demands of the market and to compete with leading universities in Lebanon, such as AUB and the University of Balamand which has just started a chemical engineering program.

### ***Petroleum Engineering***

Lebanon has recently discovered what appears to be a large offshore area rich in gas and oil. The government has already set up an advisory board, presumably, to look into the best ways to exploit this important natural resource. The government estimates that within 5 to 7 years, Lebanon could start extracting gas and/or oil for domestic use and for export. If this is going to materialize within the estimated period of time, the country will see a marked increase in job opportunities for engineers and technicians working in this sector. A completely new industry will be developed and it will require a large supply of engineers of virtually all specialties, including, of course, petroleum engineers.

It is thus imperative for NDU, and it should be part of its strategic plan, to initiate, as soon as possible, a petroleum engineering program in anticipation of the expected large demand in petroleum engineers that is likely to occur in the near future. Engineering graduates from NDU in all disciplines have been, for a few years now, seeking and often obtaining employment with oil companies. NDU graduates, generally, show interest in this area of engineering. It can hardly be overemphasized that a petroleum engineering program at NDU should be part of the University's long term strategic plan. Consequently, the program has to be developed such that within 5 to 6 years, its first class of graduates are able to join the work-force and pave the way for future generations of NDU graduates in petroleum engineering to, possibly, take in charge the oil sector in Lebanon. It is to be noted that AUB and the University of Balamand, which already have petroleum engineering programs, will most likely see their graduates dominate this vital sector in Lebanon if NDU does not establish a petroleum engineering program, as soon as possible, whose purpose would be to graduate qualified engineers that can, through their knowledge and experience, successfully compete in this important sector.

## Chemical Engineering

Suggested program leading to the degree of Bachelor of Engineering in Chemical Engineering

### Year I (41 credits)

Fall semester I (16 credits)

MAT 213: Calculus III	3 cr.
CEN 201: Engineering Mechanics	3 cr.
ENG 201(*): Introduction to Engineering	3 cr.
ENL 213: Sophomore English Rhetoric	3 cr.
CHM 211: Principles of Chemistry	3 cr.
CHE 270: Technical Drawing for Chemical Engineers	1 cr.

Spring semester I (16credits)

MAT 215: Linear Algebra	3 cr.
MAT 235: Ordinary Differential Equations	3 cr.
PHS 203: General Physics III	3 cr.
CHE 201: Chemical Engineering Principles	3 cr.
CHM 221: Organic Chemistry I	3 cr.
CHM 271: Principles of Chemistry Lab.	1 cr.

Summer semester I (9 credits)

ENL 230: English in the Workplace	3 cr.
GER: Group II	3 cr.
ENG 202: Computers and Engineering	3 cr.

(\* ) ENG 201 is to include an introduction to chemical engineering as a discipline and a description of the chemical engineering profession.

### Year II (43 credits)

Fall semester II (17 credits)

EEN 205: Electric Circuits	3 cr.
MEN 200: Science of Materials	3 cr.
MEN 210: Thermodynamics I	3 cr.
CHM 222: Organic Chemistry II	3 cr.
CHM 272: Organic Chemistry Lab.	2 cr.
CHM 321: Physical Chemistry	3 cr.

Spring semester II (17 credits)

CSC 212: Program Design and Data Abstraction	3 cr.
PHS 275: Experimental Physics I	1 cr.
CHM 371: Physical Chemistry lab	1 cr.
CHE 310: Chemical Engineering Thermodynamics	3 cr.
CHE 330: Separation Processes	3 cr.

CHE 341: Instrumentation and Measurements	3 cr.
MEN 320: Fluid Mechanics I	3 cr.

Summer semester II (9 credits)

GER: Group III	3 cr.
GER: Group I	3 cr.
GER: Group IV	3 cr.

**Year III (34 credits)**

Fall semester III (16 credits)

MAT 339: Numerical Analysis	3 cr.
CHE 371: Transport Phenomena Lab	1 cr.
CHE 410: Heat and Mass Transfer Operations	3 cr.
CHE 430: Reactor Engineering and Reactor Design	3 cr.
CHE 432: Safety and Loss Prevention	3 cr.
CHE 441: Chemical Process Design	3 cr.

Spring semester III (17 credits)

MAT 326: Probability and Statistics for Engineers	3 cr.
CHE 442: Process Control	3 cr.
CHE 443: Process Control Lab	1 cr.
CHE 450: Principles of Corrosion	3 cr.
CHE 461: Unit Operations	3 cr.
CHE 471: Unit Operations Lab	1 cr.
GER: Group V	3 cr.

Summer semester III (1 credit)

CHE 489: Approved Professional Training	1 cr.
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**Year IV (32 credits)**

Fall semester IV (16 credits)

CHE 445: Process Synthesis and Optimization	3 cr.
CHE 452: Applied Transport Phenomena	3 cr.
CHE 598: Engineering Design I	1 cr.
CHE 5xx: Technical Elective	3 cr.
GER: Group VI	3 cr.
GER: Group VII	3 cr.

Spring semester IV (16 credits)

CHE 599: Engineering Design II	2 cr.
CHE 5xx: Technical Elective	3 cr.
CHE 5xx: Technical Elective	3 cr.
CHE 5xx: Technical Elective	3 cr.
CHE 57x: CHE Laboratory Elective	1 cr.
CHE 57x: CHE Laboratory Elective	1 cr.
Free Elective	3 cr.

**List of Technical Electives**

CHE 500: Industrial Safety	3 cr.
CHE 502: Polymer Science and Engineering	3 cr.
CHE 505: Principles of Electrochemistry	3 cr.
CHE 511: Desalination	3 cr.
CHE 520: Biochemical Engineering	3 cr.
CHE 530: Wastewater Treatment	3 cr.
CHE 533: Industrial Air Pollution Control	3 cr.
CHE 535: Energy Conversion	3 cr.
CHE 540: Process Modeling	3 cr.
CHE 541: Petrochemical Processes	3 cr.
CHE 543: Petroleum Refining	3 cr.
CHE 581: Special Topics in Chemical Engineering	3 cr.

**List of Laboratory Electives**

CHE 571: Corrosion Lab	1 cr.
CHE 572: Electrochemistry Lab	1 cr.
CHE 573: Bio-chemical Lab	1 cr.
CHE 574: Polymer Synthesis Lab	1 cr.

**CHE Program Statistics**

Number of CHE credits (including CHE technical electives): 61

Number of non-CHE engineering credits: 21

Number of MAT credits: 15

Number of CHM credits: 16

Number of PHS credits: 4

Number of CSC credits: 3

Number of GER credits: 27

Number of free elective credits: 3

Including: 1 Physics lab, 3 Chemistry labs and 5 Chemical Engineering labs.

## CHE Course Description

**CHE 201, Chemical Engineering Principles (3.0); 3 cr.**

Introduction to basic methods and principles in Chemical Engineering. The fundamentals of engineering calculations (units and dimensions), behavior of fluids, mass balances, processes and process variables. Prerequisite: CHM 211.

**CHE 270, Technical Drawing for Chemical Engineers (0.2); 1 cr.**

Symbols used in Chemical engineering. Use of existing CAD software to generate drawings for chemical systems.

**CHE 310, Chemical Engineering Thermodynamics (3.0); 3 cr.**

Application of thermodynamic equilibrium; free energy and equilibrium; phase rule; chemical reaction equilibrium for homogenous and multicomponent/multiphase systems. Application to the design of binary distillation. Prerequisites: CHE 201, MEN 210.

**CHE 330, Separation Processes (3.0); 3 cr.**

This course covers concepts underlying separation processes. Equilibrium-based processes with staging and continuous contacting, distillation, evaporation, liquid-liquid extraction, leaching. Introduction to membrane based separations. Co-requisite: CHE 310.

**CHE 341, Instrumentation and Measurements (3.0); 3 cr.**

Laboratory safety. Application of experimental methods to chemical engineering problems. Data acquisition and analysis including error analysis. Selection of sensors and other pick-up devices to be used in conjunction with data acquisition software. Prerequisites: EEN 205, CHE 201.

**CHE 371, Transport Phenomena Lab (0.2); 1 cr.**

Hands-on experience with heat, mass and momentum transport phenomena. Prerequisite: CHE 201.

**CHE 410, Heat and Mass Transfer Operations (3.0); 3 cr.**

Transport of heat and mass by diffusion and convection; transport of heat by radiation; diffusion; convective mass transfer; drying; absorption; mathematical formulation of problems and equipment design for heat and mass transfer. Prerequisites: CHE 310, MEN 320

**CHE 430, Reactor Engineering and Reactor Design (3.0); 3 cr.**

Review of fundamental concepts in chemical reaction thermodynamics and kinetics. Mass and energy balances for homogenous ideal reactors. Batch, semi-batch and continuous operation. Minimization of by-product and pollution production. Heterogeneous reactions, effect of heat and mass transfer on the global rate. Prerequisites: CHE 310, CHM 222, Co-requisite CHE 410.

**CHE 432, Safety and Loss Prevention (3.0); 3 cr.**

This course outlines the hazards associated with the operations of process industries. Estimates of the extent of each hazard and the recommended justification of protection methods are performed including human behavior and human errors. Prerequisite: CHE 201.

**CHE 441, Chemical Process Design (3.0); 3 cr.**

Analysis of design alternatives. Structure of process design systems, degrees of freedom, information flow. Computer-aided process and plant design programs, physical properties, specifications, recycle convergence, optimization, applications, economics. Safety, environmental control in plant design. Prerequisite: CHE 330, Co-requisite: CHE 410.

**CHE 442, Process Control (3.0); 3 cr.**

Dynamic modeling of processes, transfer functions, first and higher-order systems, dead-time, open and closed loop responses, empirical models, stability, feedback control, controller tuning, transient response, frequency response, feedforward and ratio control, introduction to computer control, sampling, discrete models, Z-transform, introduction to multivariable control. Prerequisites: CHE 330, CHE 410, CHE 341, MAT 339.

**CHE 443, Process Control Lab (0.2), 1 cr.**

Hands-on experience with chemical process control applications. Co-requisite: CHE 442.

**CHE 445, Process Synthesis and Optimization (3.0); 3 cr.**

Analysis of design alternatives and choice of methods in chemical engineering. Computer software packages and flow sheets. Prerequisite: CHE 410.

**CHE 450/MEN 450, Principles of Corrosion (3.0); 3 cr.**

Thermodynamics and kinetics of metallic corrosion. The common forms of corrosion and corrosion susceptibility tests. Electrochemical measurement of corrosion rates. Corrosion prevention, economic considerations. High temperature oxidation and sulphidation. Corrosion case histories. Prerequisites: MEN 200, MEN 210.

**CHE 452, Applied Transport Phenomena (3.0); 3 cr.**

Basic principles of momentum, heat and mass transport with applications to equipment design. Physical separation processes. Prerequisites: CHE 410, CHE 371.

**CHE 461, Unit Operations (3.0); 3 cr.** Transportation, mixing and storage of fluids. Fluid flow in pipes and conduits. Principles of phase separation of multi-phase systems through evaporation, sedimentation and other techniques. Prerequisites: CHE 201, CHE 410.

**CHE 471, Unit Operations lab (0.2), 1 cr.**

Experiments performed on the separation of multi-phase systems. Experimental studies of unit operations. Hands-on experience involving chemical plant operations, in general. Prerequisites: CHE 330, CHE 410, CHE 430.

**CHE 489, Approved Professional TraininError! Bookmark not defined.g (0.0); 1 cr.** Two-month-training in a chemical engineering environment in which the student is exposed to different aspects of chemical engineering practice and equipment: design, construction, testing, maintenance, etc. Prerequisite: Department Approval.

**CHE 500, Industrial Safety (3.0); 3 cr.**

Introduction, preventing emergencies in the process industry, human error, identification and assessment of hazards, fires and explosions, hazard of plant modification, case studies. Prerequisites: CHM 201.

**CHE 502, Polymer Science and Engineering (3.0); 3 cr.**

Application of engineering fundamentals to the preparation and processing of polymers emphasizing the relationship between polymer structure and properties. Topics include: polymer synthesis techniques, characterization of molecular weight, crystallinity, glass transition, phase behavior, mechanical properties, visco-elasticity, rheology, and polymer processing for use in blends and composite materials. Prerequisites: CHM 222, MEN 200.

**CHE 505, Principles of Electrochemistry (3.0); 3 cr.**

Electrochemical systems: electrodes, reactors. Electrochemical stoichiometry, thermodynamics and kinetics. Mass and charge transport. Current and potential distribution in an electrochemical reactor. Electrocatalysis. Fuel cells technology. Batteries. Industrial electrochemical processes. Electrochemical sensors. Biomedical electrochemistry. Passivity, corrosion and corrosion prevention. Electrocrystalization. Experimental methods. Prerequisite: CHM 371.

**CHE 511, Desalination (3.0); 3 cr.**

Thermal and membrane-based desalination technologies for fresh water production. Consideration of economic and environmental factors: Prerequisites: CHE 410, CHE 310.

**CHE 520, Biochemical Engineering (3.0); 3 cr.**

Background and basic techniques that are used in biotechnology. It includes properties of biological materials. Dynamics, control, and operation of biological systems and processing of biological materials.

**CHE 530, Wastewater Treatment (3.0); 3 cr.**

Characterization of industrial wastes, petroleum refinery wastes, treatment processes, solid-liquid separation, ion exchange, adsorption, biological treatments, reverse osmosis, economics, regulations, moral, legal and social implications. Prerequisite: CHE 201.

**CHE 533, Industrial air Pollution Control (3.0); 3 cr.**

Air pollution effects, control laws and regulations, measurements, emission estimates, meteorology for air pollution control engineers, dispersion models, nature of particulate pollutants, control of primary particulates, control of volatile organic compounds, sulfur oxides and nitrogen oxides, air pollutants and global climate. Prerequisite: MEN 320.

**CHE 535/MEN 510, Energy Conversion (3.0); 3 cr.**

Fundamentals of energy conversion: thermal power plants, nuclear and fossil fuels, etc. Energy resources. Energy conservation and recovery. Energy storage. Pollution and environmental issues. Prerequisites: CHE 310 or MEN 310.

**CHE 540, Process Modeling (3.0); 3 cr.**

Aspects of chemical plant design from initial concept through preliminary estimate; flow diagrams, equipment cost estimation, economic analysis, safety, and environmental issues; computer-aided process design. Prerequisites: CHE 330, CHE 410, MAT 339.

**CHE 541, Petrochemical Processes (3.0); 3 cr.**

Petroleum chemistry; occurrence, composition of crude oil, distillation, catalytic and thermal cracking, alkylation, hydrogenation, isomerization, polymerization, techniques and economics of the production of basic and intermediate petrochemicals as well as some end products. Prerequisites: CHM 222, CHE 441.

**CHE 543, Petroleum Refining (3.0); 3 cr.**

Refinery organization, refinery feed stocks and products, crude distillation, cracking and reforming, hydrotreating, alkylation, lubricating oils production, petroleum gases, hydroprocessing, product blending, environmental constraints on refinery products, term project using actual refinery data to be utilized for typical design calculation on the above operations. Prerequisites: CHM 222, CHE 410.

**CHE 571, Corrosion Lab (0.2); 1 cr.**

This course covers selected standardized corrosion measurement technique. It also covers corrosion prevention methods such as cathodic protection, corrosion inhibitor and passivation. Co-requisite: MEN 450.

**CHE 572, Electrochemistry Lab (0.2); 1 cr.**

This course covers experiments in electrochemistry at ordinary laboratory temperatures and pressures. Anodic and cathodic polarization measurements, Electrochemical Impedance Spectroscopy. Co-requisite: MEN 450.

**CHE 573, Bio-Chemical Lab (0.2); 1 cr.**

Bench studies in biotechnology to illustrate properties of biological materials, dynamics, control, and operation of biological systems. Prerequisites: CHM 321, CHE 330.

**CHE 574, Polymer synthesis Lab (0.2); 1 cr.**

Selected experiments illustrating polymer processing and their mechanical properties are conducted. This includes experiments on plastic and fibrous materials. Prerequisite: CHM 222.

**CHE 581, Special Topics in Chemical Engineering (3.0); 3 cr.**

Material includes coverage of recent developments in chemical engineering that are needed to update students on the latest technologies. Department determines topics to be covered and prerequisites when offered.

**CHE 598, Engineering Design I (1.0); 1 cr.**

Development of a project proposal that includes the following items: Choice of project topic, literature survey, market analysis, feasibility study, project timeline, list of materials and cost, engineering ethics issues, social and environmental impact, etc. Prerequisites: ENL 230, Department approval.

**CHE 599, Engineering Design II (2.0); 2 cr.**

Implementation of the engineering design project that was proposed in CHE 598. Includes report, final presentation. Prerequisite: CHE 598.

## Petroleum Engineering

Suggested program leading to the degree of Bachelor of Engineering in Petroleum Engineering

**Year I (40 credits)**

Fall semester I (15 credits)

MAT 213: Calculus III	3 cr.
CEN 202: Engineering Mechanics: Statics	3 cr.
ENG 201(*): Introduction to Engineering	3 cr.
ENL 213: Sophomore English Rhetoric	3 cr.
CHM 211: Principles of Chemistry	3 cr.

Spring semester I (16 credits)

MAT 215: Linear Algebra	3 cr.
MAT 224: Calculus IV	3 cr.
MEN 202/CEN 203: Mechanics of Materials I	3 cr.
GEO 201: Physical Geology	3 cr.
CHM 221: Organic Chemistry I	3 cr.
CHM 271: Principles of Chemistry Lab	1 cr.

Summer semester I (9 credits)

ENL 230: English in the Workplace	3 cr.
PHS 203: General Physics III	3 cr.
GER Group I	3 cr.

(\* ) ENG 201 is to include an introduction to petroleum engineering as a discipline and a description of the petroleum engineering profession.

**Year II (42 credits)**

Fall semester II (17 credits)

CEN 204: Mechanics of Materials Lab.	1 cr.
ENG 202: Computers and Engineering	3 cr.
ENG 210: Introduction to Engineering Economy	3 cr.
MAT 235: Ordinary Differential Equations	3 cr.
MEN 201: Engineering Mechanics: Dynamics	3 cr.
MEN 210: Thermodynamics I	3 cr.
PHS 275: Experimental Physics I	1 cr.

Spring semester II (16 credits)

EEN 205: Electric Circuits	3 cr.
MAT 326: Probability and Statistics for Engineers	3 cr.
MEN 320: Fluid Mechanics I	3 cr.
PEN 205: Reservoir Rock Properties	3 cr.
PEN 220: Petroleum Reservoir Fluids	3 cr.
PEN 275: Rock Properties Lab.	1 cr.

Summer semester II (9 credits)

GER Group II	3 cr.
GER Group VII	3 cr.
GER Group VI	3 cr.

**Year III (34 credits)**

Fall semester III (16 credits)

CSC 212: Program Design and Data Abstraction	3 cr.
PEN 305: Structural Geology & Stratigraphy for Petroleum Engr.	3 cr.
MAT 339: Numerical Analysis	3 cr.
MEN 376: Thermo-Fluid Lab.	1 cr.
PEN 302: Fundamentals of Reservoir Engineering	3 cr.
GER Group IV	3 cr.

Spring semester III (17 credits)

MAT 335: Partial Differential Equations	3 cr.
PEN 310: Momentum, Heat and Mass transfer	3 cr.
PEN 320: Well Logging and Formation Evaluation	3 cr.
PEN 340: Drilling and Completion I	3 cr.
PEN 371: Reservoir Fluid Mechanics Lab.	1 cr.
PEN 372: Well Logging and Formation Evaluation Lab.	1 cr.
GER Group V	3 cr.

Summer semester III (1 credit)

PEN 489: Approved Professional Training	1 cr.
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**Year IV (34 credits)**

Fall semester IV (17 credits)

PEN 405: Geophysics for Petroleum Engineers	3 cr.
PEN 410: Petroleum Production	3 cr.

PEN 440: Drilling and Completions II	3 cr.
PEN 472: Drilling and Production Engineering Lab.	1 cr.
PEN 598: Engineering Design I	1 cr.
PEN 4xx: PEN Technical Elective	3 cr.
GER Group III	3 cr.

Spring semester IV (17 credits)

PEN 450: Petroleum Economics	3 cr.
PEN 461: Surface Production Operations	3 cr.
PEN 599: Engineering Design II	2 cr.
PEN 4xx: PEN Technical Elective	3 cr.
PEN 4xx: PEN Technical Elective	3 cr.
Free Elective	3 cr.

**List of Technical Electives**

PEN 500: Storage and Transportation of Petroleum Fluids	3 cr.
PEN 501: Offshore Technology	3 cr.
PEN 502: Advanced Reservoir Engineering	3 cr.
PEN 503: Reservoir Modeling	3 cr.
PEN 508: Natural Gas Processing	3 cr.
PEN 510: Thermodynamics of Petroleum Fluids	3 cr.
PEN 512: Separation Processes	3 cr.
PEN 520: Well Test Analysis	3 cr.
PEN 525: Improved Recovery Technique	3 cr.
PEN 540: Pollution Prevention and Control Energy Industry	3 cr.
PEN 581: Special Topics in Petroleum Engineering	3 cr.

**PEN Program Statistics**

Number of PEN credits (including PEN technical electives): 53  
 Number of non-PEN engineering credits: 29  
 Number of CSC credits: 3  
 Number of MAT credits: 21  
 Number of CHM credits: 7  
 Number of PHS credits: 4  
 Number of GER credits: 27  
 Number of GEO credits: 3  
 Free elective credits: 3  
 Including: 1 Physics lab, 1 Chemistry lab, 1 Mechanics lab, 1 Thermofluid lab and 4 Petroleum Engineering labs.

**PEN Course Description**

**PEN/CEN 205, Reservoir Rock Properties (3.0); 3 cr.**

Fundamental course establishing primary petrophysical concepts, properties and their measurement. Rock types, distribution, composition and structure, porosity, permeability, resistivity, wettability, water saturation, elastic moduli, and effects of pressure and temperature on rock properties. Prerequisites: GEO 201, CHM 211, MEN 210.

**PEN/CEN 275, Rock Properties Laboratory (0.2); 1 cr.**

Measurement and analysis of reservoir properties such as porosity, permeability, fluid saturation, grain size, elastic moduli and pore throat sizes. The course will stress safety concerns appropriate for all laboratory procedures, error analyses and report writing. Prerequisite: GEO 201. Co-requisite: PEN 205.

**PEN 220, Petroleum Reservoir Fluids (3.0); 3 cr.**

Behavior of gases. Phase behavior of liquids. Qualitative and quantitative phase behavior of hydrocarbon systems. Reservoir fluid characteristics. Application of these concepts to the prediction of gas and gas-condensate reservoir behavior. Prerequisites: PEN 205, MEN 210.

**PEN 302, Fundamentals of Reservoir Engineering (3.0); 3 cr.**

Fundamentals of evaluation of oil and gas reservoirs. Reservoir volumetrics. Material balance. Darcy's law and equation of continuity. Diffusivity equation. Streamlines. Well models. Introduction to well testing. Decline curve analysis. Natural water influx. Prerequisites: PEN 205, PEN 220, MAT 235.

**PEN 305, Structural Geology and Stratigraphy for Petroleum Engineers (3.0); 3 cr.**

Treatment of structural and stratigraphic geology with an emphasis on aspects of importance to petroleum engineering. Investigation of mechanical principles relating to the earth's crust. Descriptive study of nomenclature, causes of tectonic deformation, sedimentary processes and environments, and stratigraphic principles. Prerequisites: GEO 201, PHS 203. Co-requisite: MEN 210.

**PEN 310, Momentum, Heat and Mass Transfer (3.0); 3 cr.**

The common mathematical and physical basis of these processes is presented. Calculation methods for all three processes. Design procedures of equipment for fluid flow, heat transfer and diffusion processes. Prerequisites: MEN 210, MAT 224, MAT 235.

**PEN 320, Well Logging and Formation Evaluation (3.0); 3 cr.**

Basic formation evaluation concepts. Borehole environment. Principles of resistivity, radiation, thermal and elastic wave measurements and measuring tools. Applications to formation evaluation using commercial software package. Prerequisites: PEN 205, PEN 220, GEO 201. Co-requisite PEN 372.

**PEN 340, Drilling and Completions I (3.0); 3 cr.**

Drilling operations, drilling costs and economics. Drilling fluids, pressure losses in circulating systems, rotary drilling bits and penetration rate. Rotary drilling techniques. Pore and fracture gradients. Prerequisites: MEN 202 or CEN 203, PEN 205, MEN 320, GEO 201.

**PEN 371, Reservoir Fluid Mechanics Laboratory (0.2); 1 cr.**

Laboratory experiments in hydrocarbon phase behavior, saturation pressure, real fluid properties, relative permeability, secondary recovery by water flooding and gas displacement. Volumetric reserve estimation. Statistical analyses of core data. Two-dimensional flow. Enhanced oil recovery using surfactants and polymers. Prerequisite: PEN 302.

**PEN 372, Well Logging and Formation Evaluation Laboratory (0.2); 1 cr.**

Laboratory exercise to stimulate well logging tools measurement and obtain resistivity and formation factor for core plug. Introduction to the state of the art well logging interpretation software to perform exercises. Co-requisite: PEN 320.

**PEN 405, Geophysics for Petroleum Engineers (3.0); 3 cr.**

Geosciences concepts and technologies with applications in petroleum engineering: 2D-3D-4D seismic, borehole geophysics, passive seismic, controlled source electromagnetics, geophysical and geological modeling and inversion. Prerequisites: PEN 305, ENG 202.

**PEN 410, Petroleum Production (3.0); 3 cr.**

Tubing and packer design. Hydraulic fracturing and acidizing. Oil and gas well performance. Vertical lift and choke performance. Systems analysis. Production operations. Prerequisites: PEN 220, PEN 340.

**PEN 440, Drilling and Completions II (3.0); 3 cr.**

Wellbore. Well planning. Casing design. Direction control. Drilling program preparation. Offshore operations. Cost control and AFE. Post-drilling review, and economics. Prerequisites: MAT 339, PEN 340, PEN 410.

**PEN 450, Petroleum Economics (3.0); 3 cr.**

Economics of the upstream sector in all its aspects: reserves, players (oil companies, service companies), investments, costs and benchmarking, certainty economics applied to petroleum projects cash flow including taxation, decline curve analysis and oil and gas reserve estimate, application of uncertainty analysis and the use of statistical and probabilistic properties of reservoir description, standard methods of investment analysis when risk has to be coped with. Prerequisites: ENG 210, PEN 302.

**PEN 461, Surface Production Operations (3.0); 3 cr.**

Oil and gas treating process equipment, design and operation. Two-phase and three-phase separators. Heater treaters. Fluid gathering and distribution systems. Pumps and compressors. Flow measurement and production testing. Natural gas dehydration and sweetening. Produced water treatment and disposal. Prerequisites: PEN 310, PEN 440.

**PEN 472, Drilling and Production Engineering Laboratory (0.2); 1 cr.**

Properties of drilling and completion fluids. Well control. Oil and gas well testing. Production operations. Evaluation of artificial lift systems. Gas measurement. Prerequisite: PEN 410, Co-requisite: PEN 440.

**PEN 489, Approved Professional Training (0.0); 1 cr.** Two-month-training in a petroleum engineering environment in which the student is exposed to different aspects of petroleum engineering practice and equipment: design, construction, testing, maintenance, etc. Prerequisite: Department Approval.

**PEN 500, Storage and Transportation of Petroleum Fluids (3.0); 3 cr.**

Methods of crude oil and gas transportation, types of storage tanks and pressure vessels, design and selection of storage tanks according to API standards, maintenance of storage tanks. Prerequisites: MEN 210, PEN 410.

**PEN 501, Offshore Technology (3.0); 3 cr.**

Introduction to offshore operations, procedure for the design and construction of the equipment and facilities of offshore operations, selection of offshore equipment. Prerequisite: PEN 410.

**PEN 502, Advanced Reservoir Engineering (3.0); 3 cr.**

Advanced reservoir engineering concepts required for effective production of oil and gas. Reservoir characterization. Reservoir heterogeneity and anisotropy. Recovery mechanisms.

Leverett J-functions. Upscaling. Flow simulation. History matching and forecasting. Uncertainty and risk. Prerequisites: MAT 339, PEN 302, PEN 410.

**PEN 503, Reservoir Modeling (3.0); 3 cr.**

Development of the general material balance equation, solution of PDE using numerical methods, prediction of reservoir performance. Prerequisite: PEN 302, MAT 335, MAT 339.

**PEN 508, Natural Gas Processing (3.0); 3 cr.**

Gas conditioning. Processing of gas for its fluids. Design of adsorption and absorption facilities. Fractionation design. Prerequisite: PEN 310

**PEN 510, Thermodynamics of Petroleum Fluids (3.0); 3 cr.**

Chemical thermodynamics and its applications to the behavior of reservoir fluids, with emphasis on phase behavior of multi-component mixtures. Prerequisite: MEN 210.

**PEN 512, Separation Processes (3.0); 3 cr.**

Separation processes applied to petroleum fluids. Equilibrium-based processes with staging and continuous contacting, distillation, evaporation, liquid-liquid extraction, leaching. Introduction to membrane based separations. Prerequisites: PEN 310. Co-requisite: PEN 510.

**PEN 520, Well Test Analysis (3.0); 3 cr.**

Diffusivity equation. Exponential integral solution. Principle of superposition. Draw-down testing. Skin effects. Wellbore storage. Type curve matching. Reservoir limit test. Buildup testing. Bounded reservoirs. Average reservoir pressure. Drill stem testing. Interference testing. Pulse testing. Reservoir heterogeneities. Anisotropy. Stratification. Sealing faults. Prerequisites: PEN 302, PEN 320.

**PEN 525, Improved Recovery Techniques (3.0); 3 cr.**

New wellbore and reservoir techniques for improved recovery. Feasibility analysis. Diagnostic techniques. Single well operations. Infill drilling. Horizontal wells and multilaterals. Water flooding. Enhanced oil recovery. Prerequisites: PEN 302, PEN 410, PEN 440.

**PEN 540, Pollution Prevention and Control Energy Industry (3.0); 3 cr.**

Overview of environmental laws and regulations. Environmental standards for air quality, water and land. Regulatory approval process for new energy projects. Base-line Study and environmental impact assessment. Environmental review of new energy projects. Pollution prevention methodology and techniques. Separation and recycle streams. Process modification, integration, analysis and control. Risk assessment. Prerequisites: PEN 410, PEN 440.

**PEN 581, Special Topics in Petroleum Engineering (3.0); 3 cr.**

Material includes coverage of recent developments in petroleum engineering that are needed to update students on the latest technologies. Department determines topics to be covered and prerequisites when offered.

**PEN 598, Engineering Design I (1.0); 1 cr.**

Development of a project proposal that includes the following items: Choice of project topic, literature survey, market analysis, feasibility study, project timeline, list of materials and cost, engineering ethics issues, social and environmental impact, etc. Prerequisites: ENL 230, Department approval.

**PEN 599, Engineering Design II (2.0); 2 cr.**

Implementation of the engineering design project that was proposed in PEN 598. Includes report, final presentation. Prerequisite: PEN 598.

To: Members of the University Graduate Committee  
From: R Khoueiri, Secretary  
Subject: **Minutes of the April 25, 2014 UGC Meeting** Date:  
Date: April 25, 2014  
Ref: UGC4-25-14

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**Approved by the UC on May 23, 2014**

The committee unanimously approved the Faculty of Humanities' request to reduce the number of credits in the **MA in Education and MA in English programs down to 33 cr. and 30 cr.** respectively, as long as the minimums set are respected, as stipulated in the relevant decrees by the MEHE.

**Notre Dame University-Louaize  
FNAS – New Course Form – BIO 631**

**Approved by the UC on May 23, 2014**

1. **Date:**

2. **Course Proposed by**

Name: Dr. Esther Ghanem  
Rank: Assistant Professor  
Department: Sciences/Biology  
Faculty: Natural and Applied Sciences

3. **Course Code and Number:**   
e.g., MEN 330 (3.0)

4. **Course Credit (enter number of credits):**

5. **Course Title:**

**Applied Techniques in Molecular Biology**

6. **Course Description (as it would appear in the course catalog):**

The course introduces students to the basic principles and techniques of molecular biology. Major techniques include cloning, DNA purification, bacterial transformation, electroporation of mammalian cells, restriction analysis, nucleic acid hybridization, southern blotting, and RT-PCR.

7. **Course Prerequisites:** Graduate standing; consent of the instructor.

8. **Course Co-requisites:**

9. **Course Justification:**

The course applies the theoretical knowledge gained throughout the undergraduate and graduate courses into practical experience whereby students perform the basic molecular approaches that can be applied in any branch of biology. In addition, this course would advance the students' abilities to successfully complete the Master's thesis (BIO 691) pertinent to the Molecular field, to be more equipped to pursue higher degrees in prestigious institutions, and to become more skillful and competitive in the job market.

- This is a major elective that is needed for graduate students adopting a track in Cell Biology/ Molecular Biology.
- Grading will be as follows:

<b>Tasks</b>	<b>Assessment</b>
Final exam	40 %
Lab reports	25%
Lab performance	5%
Lab notebook	20%
Paper-style report	10%
<b>Total</b>	<b>100 %</b>

10. **Course Learning Outcomes (CLO) and their relations to the Program Educational Objectives (PEO) :**

Upon successful completion of this course the students will be able to:

- Explain and perform major techniques in molecular biology
- Correlate previous theoretical knowledge with practical experience in the laboratory
- Develop skills in noting and troubleshooting experimental results
- Critically interpret and analyze scientific data obtained in the lab

The proposed learning outcomes comply with the overall PEO as students will be better prepared to work independently and think critically in identifying and solving research problems.

11. **Does the course content overlap with any existing course? If yes, please describe the extent of the overlap. If no, skip this question.**

12. Does this course replace an existing course? If yes, please list the course(s) to be replaced. If no, skip this question.

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13. Has this course been offered before as a special topic or other course type? If yes, please indicate how the course was taught and for how long it has been offered. If no, skip this question.

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14. Semester and year you plan to offer the course:

Spring 2015
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15. Expected student enrollment in the course:

6
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16. If available, provide the name(s) and area(s) of expertise of the faculty member(s) who will be teaching the course:

Dr. Esther Ghanem, Molecular and Cellular Biology Dr. Pauline Aad, Animal Breeding and Reproduction Dr. Diala El-Khoury, Molecular Biology Dr. Tanos G. Hage, Plant Biochemisty-Molecular Biology
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17. Please attach a course syllabus to this form (the syllabus should include textbook titles and/or reference material).


# Course Syllabus

## STA 101 (3 cr.) - Basic Statistics

Approved by the UC on February 12, 2014

Spring 2014

Taught by:

Sections:

Office Hours:

Contact:

### 1 Course Description

STA 101 is an introductory course designed to introduce students to basic statistical techniques in order to analyze and interpret results such as mean, mode, median, standard deviation etc... The topics covered include: frequency distributions, graphing, measures of central tendency and dispersion, and probability law.

### 2 Student Learning Outcomes

Upon the completion of this course, students are expected to:

- become familiar with some basic statistical techniques
- use their calculators efficiently
- calculate measures of central tendency and dispersion
- draw different graphs
- Solve direct probability exercises

### 3 Teaching Methodology and Techniques

This course is lecture based. For every chapter:

- the professor explains the required material and solves relevant examples to make sure that the students fully understand the topics covered
- Students are required to solve a set of exercises indicated on their syllabus, as a homework, before the teachers solves them in class
- The professor holds a graded exercise session at the end of the chapter, where students work in groups of two in order to benefit from each others knowledge

### 4 Required Text Book

Prem S. Mann, 2004. Introductory Statistics, 5<sup>th</sup> Edition Hoboken, N.J.: John Wiley & Sons, c2004.

### 5 Resources Available to students

Blackboard (bb) Software: Students who are not familiar with the Blackboard system are advised

to attend a training session at the University Computer Services.

### 6 Grading and Evaluation

Attendance and Participation	5%
Team Assignments	10%
Exam I            Week 8	25%
Exam II           Week 13 before final drop	25%
Final Exam	35%
<b>Total</b>	<b>100%</b>

## 7 Course Schedule

The following table details the dates of material covered in class along with requested assignments

<u>Date</u>	<u>Material</u>	<u>Homework</u>
<b>Week 1</b>		
	<b><u>Chp (1)</u></b> <b>Introduction</b> 1.1 What is Statistics? 1.2 Types of Statistics 1.3 Population Versus Sample  1.4 Basic Terms	<u>Page: 8</u> 1.5, 1.6 & 1.7  <u>Pages: 10 &amp; 11</u> 1.10 & 1.12
<b>Week 2</b>		
	1.5 Types of Variables  1.8 Summation Notation	<u>Page: 13</u> 1.14, 1.15, 1.16 & 1.17 <u>Page: 18</u> 1.22, 1.24, 1.26 & 1.28
<b>Week3</b>		
	<b><u>Graded Exercise Session for Chp (1)</u></b>  <b><u>Chp (2)</u></b> <b>Organizing Data</b> 2.1 Raw Data 2.2 Organizing and Graphing Qualitative Data	<u>Page:33</u> 2.3; 2.4 ; 2.6; 2.8;2.10
<b>Week 4</b>		
	2.3 Organizing and Graphing Quantitative Data  2.5 Cumulative Frequency Distributions	<u>Page: 49, 50, 52</u> 2.14, 2.16, 2.20 and 2.28 <u>Pages: 56 &amp; 57</u> 2.34 ;2.35 & 2.38
<b>Week 5</b>		
	<b><u>Review Problems for Chp (2)</u></b> <b><u>Revision Session for Exam I</u></b> <b>Exam I</b> <b><u>Chp (3)</u></b> <b>Numerical Descriptive Measures</b> 3.1 Measures of Central Tendency for Ungrouped Data Mean - Median - Mode	<u>Pages:81, 82 &amp; 83</u> 3.10, 3.16, 3.18 ; 3.23 ;3.24
<b>Week 6</b>		
	<b><u>Chp (3)</u></b> <b>Numerical Descriptive Measures</b> 3.1 Measures of Central Tendency for Ungrouped Data (continue) 3.2 Measures of Dispersion for Ungrouped Data	<u>Pages:81, 82 &amp; 83</u> 3.10, 3.16, 3.18 ; 3.23 ;3.24 <u>Page: 91 &amp; 92</u> 3.44, 3.50;3.53 & 3.56
<b>Week 7</b>		
	3.2 Measures of Dispersion for Ungrouped Data (continue) 3.3 Mean, Variance and Standard Deviation for Grouped Data	<u>Page: 91 &amp; 92</u> 3.44, 3.50;3.53 & 3.56 <u>Pages: 98 &amp; 99</u> 3.62 & 3.66; 3.67 ;3.71
<b>Week 8</b>		
	3.5 Measures of Position  <b><u>Review Problems for Chp (3)</u></b>	<u>Pages:111 &amp; 112</u> 3.90, 3.92,3.95 & 3.96
<b>Week 9</b>		

	<b>Chp (4)</b> <b>Probability</b> <b>4.1 Experiment, Outcomes and Sample Space</b> Events, Sample Spaces Unions and Intersections Complementary Events <b>4.2 Calculating Probability</b>	<u>Pages: 139 &amp; 140</u> 4.4, 4.6, 4.8, 4.10 & 4.14  <u>Pages: 145 &amp; 146</u> 4.20, 4.24, 4.26, 4.28 and 4.32
<b>Week 10</b>		
	<b>Revision Session for Exam 2</b>  <b>Exam II</b>	
<b>Week 11</b>		
	4.3 Counting Rule 4.4 Marginal and Conditional Probabilities 4.5 Mutually Exclusive events	<u>Pages: 158 &amp; 159</u> 4.48; 4.50, 4.51, 4.52,
<b>Week 12</b>		
	4.6 Independent versus Dependent Events 4.7 Complementary Events	<u>Pages: 158 &amp; 159</u> . 4.53; 4.54; 4.55; 4.56; 4.57; 4.62; 4.59
<b>Week 13</b>		
	4.8 Intersection of Events and the Multiplication Rule 4.9 union of Events and the Addition rule	<u>Pages: 168 &amp; 169</u> 4.70, 4.74, 4.81 & 4.84 <u>Pages: 178 &amp; 179</u> 4.104, 4.110, & 4.112
<b>Week 14</b>		
	<u><b>Review Problems for Chp (4)</b></u> Chapter 5 introduction to probability 5.5 Factorials and Combinations	
<b>Week 15</b>		
	<u><b>Chp (5)</b></u> 5.5 Factorials and Combinations <u><b>Review Problems for Chp (5)</b></u>	<u>Page: 217</u> 5.40,5.41; 5.42 & 5.44; 5.46

### 8 Make Up Policy

- 1) No make up exam should be done under normal circumstances. Consequently, students missing an exam, with no justified reason, will lose the grade value of that exam.
- 2) Justified Make Up  
Abnormal circumstances do occur and make up exams take place under the following conditions:
  - a) The student shows that missing the exam was beyond his/her control.
  - b) The instructor and the chairperson accept the case presented and approve of the make up.
  - c) The students shall lose 10 points out of 100 of the grade value of the exam in question.
  - d) The make up exam shall be done in 10 days after the elapse of the exam date.

### 9 Attendance policy

- a) *“The maximum number of absences for classes that meet on MWF is six, the maximum number for classes that meet on TTh and in the summer is four (or two hours per credit course). Any student whose absences exceed the maximum limits shall automatically fail the course unless the student withdraws”.*

The word “absences” above includes authorized (excused) as well as unexcused (unauthorized) absences. *“Even below the maximum number of absences, a pattern of absences, whether authorized or not, may alter one’s grade substantially”.*

Students who wish to validate their absences have to do so through the SAO, which *“alone authorizes absences”*. Finally, *“no absence absolves a student from the responsibility of acting upon the material presented during his/her absence”.*

*(Excerpts from “Student Handbook 2007-08, p. 59)*

- b) *“Students registering during the late registration day shall be responsible for all work assigned from the beginning of the semester or the session. They shall be also subject to the requirements of the attendance policy (see a) above) as of the first day of classes”.*  
*(Excerpt from “Student Handbook 2007-08, p. 25)*
- c) *Attendance policy applies as of day one of the semester, on September 27, 2011. For students having joined their classes after the drop/add or the late registration period, the attendance policy applies as of the official time of registration in the course, not as of the student’s first appearance in class.*
- d) *A student having exceeded the maximum number of allowed absences may ask permission from his/her instructor to keep attending classes. However, he/she shall not be allowed to take any remaining quiz or final exam or to have any graded assignment, and he/she will be assigned an automatic UW. Even if the number of allowed absences has been exceeded after the date of official withdrawal from classes, the student will still get an automatic UW, and will not be admitted in any remaining quiz or final exam.*

#### **10 Use of Original Textbooks in the Classroom**

- a) *“The University does not allow photocopied textbooks in the classroom”.*
- b) *“Each course should identify whether or not a textbook is necessary”.*
- c) *“Students with photocopied textbooks in a classroom are given one week’s notice to use a printed copy”.*
- d) *“After the one-week notice students with photocopied textbooks are not accepted to be in the classroom”.*
- e) *“Students who are not accepted in the classroom are reported as absent and the absence policy” (see “Attendance policy” above) “is applied to them for that particular course”.*  
*(Excerpts from “Faculty Handbook 2007-08, p. 35)*

#### **11 System of Grades**

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (*i.e.* percentage equivalent, and the 4.0 point maximum).

<b>Grade</b>	<b>Description</b>	<b>Quality Point Value</b>	<b>Percentage Equivalent</b>
A <sup>+</sup>	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A <sup>-</sup>	Very Good	3.7	89 - 92
B <sup>+</sup>	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B <sup>-</sup>	Good	2.7	77 - 79
C <sup>+</sup>	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C <sup>-</sup>	Passing	1.7	66 - 69
D <sup>+</sup>	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59
UW	Unofficial Withdrawal	0.0	

The grade “UW” is assigned by the instructor when a registered student has never attended a class or has ceased attending and has not submitted an official course withdrawal request to the Office of the Registrar. This grade is computed as an F grade in the grade-point average.

## FNAS – Changes in Programs

approved by the UC on May 23, 2014

### 1. Revision of the semester credit distribution of the MS Biology program:

#### Master of Science in Biology Suggested Program - 36 Credits

##### Fall Semester I (10 Credits)

BIO	603	Quantitative Analysis in Biology	3 cr.
BIO	608	Advanced Biochemistry <b>or</b>	4 cr.
	636	Plant Ecology	
BIO	610	Advanced Cell Biology <b>or</b>	3 cr.
	628	Advanced Human Physiology	

##### Spring Semester I (10 Credits)

BIO	605	Research Methods in Biology	3 cr.
BIO	6xx	Major Elective	3 cr.
BIO	6xx	Major Elective	3 cr.
BIO	670	Seminar I	1 cr.

##### Fall Semester II (12 Credits)

BIO	6xx	Major Elective	3 cr.
BIO	6xx	Free Elective	3 cr.

BIO	691	Thesis	6 cr.
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##### Spring Semester II (4 Credits)

BIO	6xx	Free Elective	3 cr.
BIO	671	Seminar II	1 cr.
BIO	691	Thesis (continued)	0 cr.

Summary of amendments to the semester credit distribution of the MS Biology program:

Previous program	New (amended) program
Spring Semester I (9 Credits)	Spring Semester I (10 Credits)
Seminar I (1 cr.) listed in Fall Semester II	Seminar I (1 cr.) moved to Spring Semester I
Fall Semester II (13 Credits)	Fall Semester II (12 Credits)

### 2. Biology programs: revision of credit weights of both undergraduate and graduate courses:

N.B. all amendments are highlighted.

**BIO 218 Histology (3.0); 3 cr.** An introduction to the microscopic structure of tissues and organs, with particular emphasis on the interrelation between structure and function. *Prerequisite:* BIO 211.

**BIO 219 Pathophysiology for Nursing (2.0); 2 cr.** This course offers an integrated approach to biological alterations that affect human equilibrium. The content of this course refers to three major areas based on the health – illness continuum: control of normal body function, alteration

in body function, and failure in any system or part of body function. Prerequisite: BIO 215 or NHS 205.

**BIO 228 Parasitology (3.0); 3 cr.** Provides a general overview on the classification, morphology, development & physiology of human and animal parasites. *Prerequisite:* BIO 212.

**BIO 460 Selected Topics in Biology (3.0); 3 cr.** Students study recent and current biological issues and topics in the area of specific competence of the course instructor (or groups of instructors). *Prerequisites: consent of advisor.*

**BIO 495 Research in Biology; 1, 2 or 3 cr.** An independent research project in an area of biology under the direction of a faculty mentor. Prerequisite: Senior standing and consent of the instructor. **Corequisite: BIO485.**

**BIO 605 Research Methods in Biology (1.5); 3 cr.** This core course is designed to introduce students to conduct scientific research. Under the supervision of an instructor, students select a research project through which they learn about literature review including the access and use of print and electronic resources, proposal writing, research methods, experimental design and analysis in addition to scientific writing. At the discretion of the instructor this project can be extended in taking an additional tutorial course. This may serve as the nucleus of research for students' thesis.

**BIO 608 Advanced Biochemistry (3.3); 4 cr.** This course covers the reaction bioenergetics and metabolic pathways of biomolecules. It also provides an in-depth knowledge of the function, structure, and mode of action of binding proteins and enzymes.

**BIO 626 Developmental Neurobiology (3.0); 3 cr.** The course provides comprehensive knowledge about development of the vertebrate nervous system, both central and peripheral. It discusses the factors affecting neuroblast migration, differentiation, identification of target tissues and establishment and maintenance of synapses. Neurogenesis of selected brain regions is also considered. Prerequisite: consent of advisor.

**BIO 631 Applied techniques in Molecular Biology (2.3); 3 cr.** This course exposes students to the basic principles and techniques in recombinant DNA technology. Major techniques include cloning, bacterial transformation, restriction mapping, nucleic acid hybridization, southern blotting, and polymerase chain reaction.

### 3. Chemistry program

**CHM 421 Industrial Chemistry II: Chemical Processes (3.0); 3cr.** This course provides a broad overview of technologies and processes involved in chemical industry. Topics covered: industrial production of organic and inorganic chemicals, fermentation processes, petroleum refining, polymer processing, industrial catalysis, product development from bench to pilot plant to full-scale manufacturing, process economics and environmental considerations. *Prerequisite:* CHM 222, CHM 326

### 4. Environmental Science program

**ENS 445 Environmental Law & Regulations (3.0) ; 3 cr.** Overview of National and international environmental law and Regulations, enforcement and liability ; regulaturay agencies and working bodies.

**ENS 475 Selected Topics in Environmental Science (3.0); 3 cr.** Students study recent and current Environmental issues and topics in the area of specific competence of the course instructor (or groups of instructors). *Prerequisites: consent of advisor.*