# UNDERGRADUATE CORE CURRICULUM DESIGN

## PREFACE

The ***Undergraduate Core Curriculum Design*** lays the foundation for all of the PMU degree programs in two ways:

First, it presents the set of academic competencies that all PMU graduates are to achieve regardless of their majors. In addition it outlines how these competencies are to be assessed, including specific courses that are part of the assessment process and required for all PMU students.

Second, the volume describes and presents the syllabi for a set of core academic subjects that are included in all degree programs. The core subjects include courses in mathematics, natural and physical sciences, and social and behavioral sciences. Minimum requirements in each of the three areas are established for all degree programs, and additional courses have been designed to be used as needed by the specific academic majors.

The design reflects PMU distinguishing characteristics and a commitment to a set of global competencies and learning outcomes that are integrated throughout the curriculum in a developmental manner. The classroom experience for students is highly student-centered, interactive, and communicative.
Syllabi include techniques for incorporating opportunities for students to develop communication, teamwork, and leadership skills as part of an overall strategy for achieving the PMU core competencies.

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## I. EXECUTIVE SUMMARY

In 2004 the Texas International Education Consortium (TIEC) was commissioned to design the academic and administrative structures for the proposed new university, Prince Mohammad Bin Fahd University (PMU), located in Al Khobar, Saudi Arabia. As part of the curricula designs, the founders of PMU were committed to educating the "whole" student through an Undergraduate Core Curriculum of courses in communications, mathematics, social, and natural sciences that formed a basis for all undergraduate degree programs. The Core Curriculum also reflects a set of core competencies that were to be supported throughout all curricula. The original six competencies were adopted as learning outcomes that designated what PMU graduates will need to know, and what they must be able to do in order to be successful in their chosen fields and to contribute to the development of their community and the Kingdom.

The Core Curriculum were adopted and implemented between 2006 and 2008. In the years that followed, PMU Curriculum Committees established in each of its department reviewed and recommended changes to the curricula in order to maintain currency of the curricular offerings and to ensure that the best programs were being offered to students. These recommended changes were reviewed by TIEC in 2012.

In 2017 PMU again requested TIEC to review, update, and fine-tune the Core Curriculum as they have evolved since the review in 2012. This document is the result of the 2018 review and is based primarily on changes recommended by the PMU faculty as part of their efforts to continuously improve programs at PMU. As part of this effort, PMU also requested that two additional competencies/learning outcomes be infused into the curricula of PMU and they are also addressed in this report as well as the review reports of other PMU curricula.

The Undergraduate Core Curriculum, as described in this document, consists of three components.

- **The Assessment Capstone Series** consists of three courses required of all PMU students. The first two courses are developmental building blocks designed to increase the success of the third and final capstone course taken during the student's senior year. The Assessment Capstone Series will measure the student's success in achieving the eight learning outcomes.
- **The University Core Curriculum** contains additional courses required of all PMU students. Four courses in written, oral, and professional communication, as well as three other courses in designated competencies will develop the eight learning outcomes that will distinguish PMU graduates. The University Core Curriculum also includes required courses in Arabic Language, Islamic Studies and physical education.
- **The College Core Curriculum** prescribes academic subjects which PMU students will be required to master. Each college of the university (Engineering, Information Technology, Business Administration, and Law) will determine the specific College Core courses that will be required of its students. All students, however, are required to successfully complete courses in each of three College Core fields: natural and physical sciences, mathematics, and social and behavioral sciences.

Throughout the Core Curriculum, all assignments involve a set of learning outcomes and expectations are articulated by examples and models. Faculty lead students to think critically with a purpose beyond the classroom and assignments will include reasoning and writing for oral presentations. Critical thinking experiences in the Core Curriculum stress reasoning as a means of discovery and a tool for increasing understanding in both university courses and the student's personal life. Reasoning is recognized as a broad, extra-academic and life-enhancing ability superior

to narrow, insulated mechanical skills.

The purpose of the Core Curriculum is to furnish PMU students with a seamless education, from the Preparatory Year Program, to graduation in an academic program major, and then to employment. Those faculty members teaching in the Preparatory Year Program must be fully aware not only of the content of their individual programs, but also of the objectives and expectations of the Core Curriculum – especially the University Core Curriculum and the Assessment Capstone Series. Similarly, faculty teaching in PMU colleges must incorporate into the university's academic majors the content and processes taught in the University Core Curriculum. This attention to PMU competencies is vital for students to be evaluated successfully in the final Assessment Capstone course given during the senior year.

For this seamless process to be successful, PMU employs teaching faculty committed to using the concepts, processes, and technologies taught in the University Core Curriculum. The PMU Professional Development Center plays an important role in creating these abilities among faculty who do not have adequate backgrounds to be successful in this context.
Together with the Learning Resources Center and the programs it provides for students, the Professional Development Center will provide a framework for an evolving learning and assessment process that will shape not only the curriculum, but the university's graduates as well.

# II. FOUNDATION FOR THE PMU EXPERIENCE

## A. CORE CURRICULUM RATIONALE

A significant challenge to Saudi Arabia today is the need to increase the number of skilled and knowledgeable citizens who can ensure the Kingdom's economic and social advancement. More people need to be educated through the undergraduate degree and beyond. This need calls for expanding access to higher education, but an increased number of institutions alone will not satisfy the need. It is imperative that the education provided to graduates adequately prepares them for personal and professional success and assists them in enhancing life in their communities.

University graduates must be able to function in an evolving world – a rapidly changing, unpredictable, globally interconnected, and technologically driven world. They need to be comfortable in diverse communities and global societies. They must be able to set goals and manage complex, difficult pathways to success, and possess the skills to learn, communicate and solve problems using sophisticated technologies. They must be able to think critically and independently. They must have the self-confidence and persistence to succeed despite difficult challenges. Most of all, they need to reflect critically on their actions in business and civic life with a commitment to act responsibly and to influence others.

The PMU prepares students to be lifelong learners with the intellectual and emotional skills and adaptability required to conquer the great changes that they will undoubtedly experience during their adult lives. The university provides them with the foundation they need to develop intellectual skills, practical skills, and emotional sensitivities to prepare them to think, feel, and act competently in a complex, diverse, and constantly changing world. The university's Undergraduate Core Curriculum, and especially the diverse academic components of the College Core Curriculum, enables students to have or to locate the information they need to make informed decisions and hold responsible opinions about their lives and the world in which they live.

The PMU Core Curriculum is a vital component of ensuring learning outcomes and instilling competencies in the university's graduates. The curriculum's courses and programs develop broad learning and thinking capabilities that will complement the academic majors' specific professional skills to create a unique kind of university graduate for the Kingdom of Saudi Arabia.

## B. LEARNING OUTCOMES RATIONALE

Students who enroll in university studies often have little experience with inquiry, research, or scholarly discourse. They expect instead that they can satisfy academic requirements simply by restating content provided by their teachers. Thus, many students are poorly prepared to assume the responsibilities associated with university-level scholarship.

Needless to say, subject content is critically important. Facts, concepts, and theoretical structures of mathematics, science, history, communications, and other areas are the building blocks for learning. However, the assumption that students will be well educated by completing an academic program that requires them merely to absorb content produces educational results opposite of those needed for individual and national advancement in a scientific and technological world.

To meet the needs of today's technological world, the best educational institutions now place emphasis on learning outcomes. They concentrate on what students learn rather than what teachers teach. These institutions are developing means to determine that students not only know about their subjects, but that students can use this knowledge effectively in the workplace.

The PMU Undergraduate Core Curriculum is designed to help students develop intellectual capabilities that will enable them to engage in lifelong learning.

Before PMU students graduate, they are expected to integrate and apply their knowledge and skills to deal with actual situations and challenges. A PMU graduate will be ready for professional responsibilities, able to take initiative, and assume leadership. What is more, a PMU graduate will be prepared to continue to improve his or her competencies in the coming years.

## C. ENSURING AND ASSESSING OUTCOMES

The PMU curriculum introduces students to eight learning outcomes. Students then will be assessed, both in their major coursework as well as in the assessment courses to determine the extent to which they have achieved success in meeting the outcomes. This independent assessment will stress to students the critical importance of the university learning outcomes to their overall success as students, graduates, and professional practitioners.

### 1. Eight Distinctive Competencies

The Undergraduate Core Curriculum reflects a set of core competencies that are to be supported throughout all curricula. The eight competencies are adopted as learning outcomes that designated what PMU graduates will need to know, and what they must be able to do, in order to be successful in their chosen fields and to contribute to the development of their community and the Kingdom. These eight PMU learning outcomes are:

- **Communication**: the ability to communicate effectively in both English and Arabic in professional and social situations.
- **Technological Competence**: the ability to use modern technologies to acquire information, communicate, solve problems, and produce intended results.
- **Critical Thinking and Problem Solving:** the ability to reason logically and creatively to make informed and responsible decisions and achieve intended goals.
- **Professional Competence**: the ability to perform professional responsibilities effectively in both local and international contexts.
- **Teamwork:** the ability to work effectively with others to accomplish tasks and achieve group goals.
- **Leadership:** the ability to be informed, effective, and responsible leaders in family,

community, and the Kingdom.

- **Globally Connected:** In which students will acquire the skills to:
  - Respect all cultures and understand religious and ethnic customs that shape the opinions and actions of others from different backgrounds.
  - Respect and recognize global relationships, see the link between global and local issues, and respect the importance of each.
  - Learn from others' ideas, knowledge and practices, and accept change as inherent to a globalized world.
- **Conflict Resolution:** In which students will acquire the skills to
  - Manage and relieve stress so as to remain relaxed and focused in tense situations.
  - Control emotions, behavior, and nonverbal communication such as eye contact, facial expressions, and tone of voice.
  - Possess healthy responses to conflict such as recognizing and responding to important matters, a readiness to forgive, and a belief that resolution can support the interest and needs of both parties.
  - Be aware and respectful of differences.

These eight learning outcomes are intended to ensure that PMU students also will possess knowledge and abilities associated with mastery of the theoretical structures and methodologies of academic disciplines and professional competencies. This will further enhance their ability to function effectively as a practitioner and scholar in a selected field.

### 2. Importance of Learning Assessment

PMU assesses students' mastery of the university's designated learning outcomes in order to ensure that students have the ability and skill to use their professional preparation and knowledge effectively. (A discussion of criteria that might be used in this assessment is included in this report's Appendix A: Measuring Degrees of Success.)

Such abilities and skills are best developed by practicing learning outcomes with the intention of improving future performance. Faculty cannot transmit high level intellectual abilities solely through lectures and assignments. Students must engage in activities that allow them to learn from experience. The process of engaging in applied learning, meeting learning expectations, and receiving feedback also gives students the experiences they need to gain new insights, deepen their understanding, and improve ability and skills.

The PMU learning assessment process will help students learn how to use self-reflection and feedback to improve their decisions and actions. This skill is at the heart of the ability to develop higher level intellectual abilities.

## III. THE LEARNING OUTCOMES PROCESS

The intellectual abilities and skills associated with the university's prescribed learning outcomes will be developed over a period of time across all aspects of the university – the Assessment Capstone Series, University Core Curriculum, College Core Curriculum, and academic majors in the university's three colleges.

### A. PRINCIPLES OF LEARNING AND ASSESSMENT

Learning outcomes and their assessment at the PMU are guided by the following principles:

- **Utilization –** Learning techniques and assessments are used frequently.
- **Engagement –** Learning is an active, not a passive, process.
- **Feedback** – Learning incorporates a method of evaluation that effectively communicates

techniques for improvement to students.

- **Repetition** – Learning instills PMU values and learning outcomes through regular, repeated functions.

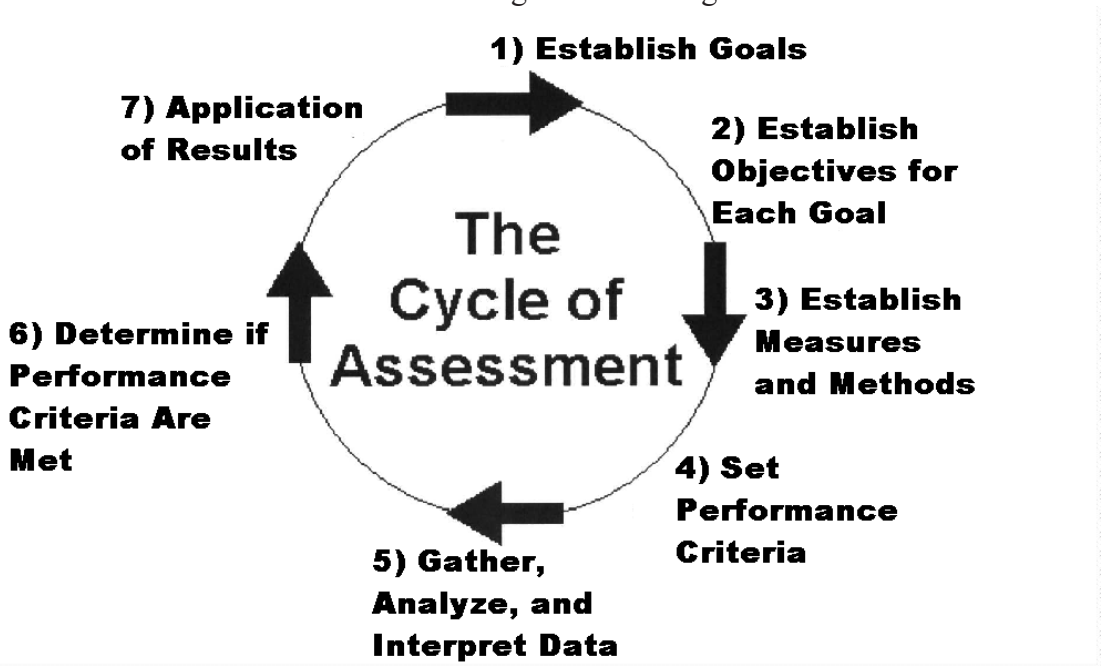
The levels of performance expected is communicated through formal and informal feedback throughout the students' university careers. Emphasis is placed on reinforcing students' strengths and motivating them toward greater achievements. Students are reminded constantly that their intellectual abilities and skills can always be improved.

## B. THE ASSESSMENT CYCLE

The cycle of assessment at the PMU evaluates the extent to which students achieve prescribed learning outcomes. This cycle is a three step process consisting of two developmental building blocks and a final capstone experience. The first two stages are designed to enhance the student's ability to succeed in the third. All three assessment steps, however, measure the students' success in achieving the university's eight learning outcomes. (The courses prescribed for this process are described in detail in Section IV., The PMU Assessment Capstone Series.)

### 1. The Role of the University's Colleges

To ensure that the PMU learning outcomes and assessment process is woven throughout all areas of the university, each college is responsible for implementing and adjusting the assessment criteria. The college provides direction to ensure the appropriate outcomes and criteria are updated; that appropriate measures are used; that relevant data are collected, analyzed, and interpreted; that performance criteria are established; and that these results are reported and utilized to improve programs.
The following model illustrates the way the colleges are continually assessed whether or not their students are achieving PMU learning outcomes.




### 2. Developing Competencies in Students

The cycle of assessment is illustrated as a circle because it is an ongoing, never-ending process. The development of students also is ongoing throughout their university experience and subsequent professional lives. No two students will develop competencies at the same time or the same rate. However, the PMU learning outcomes and competencies are based in shared behaviors. Among the behaviors that the university fosters and continually assesses are the following:

**a. Shared Competencies**

- Continuous self-directed learning
- Initiative
- Results and achievement orientation
- Planning and organizing
- Teaming and relationship arrangement
- Quality and continuous improvement
- Communication
- Coaching
- Consulting
- Critical thinking and problem solving
- Group facilitation
- Leadership
- Persuasion and influence
- Project management
- Self-management
- Visioning
- Work collaboration

**b. Technology Competencies**

- Strong proficiency in personal computer use (including word processing, spreadsheets, presentation, database, Internet, and e-mail)
- Basic programming and principles of database development and management
- Fundamentals of project management

**3. A Tool for Institutional Improvement**

All assessments provide information for improving college programs as well as determining student achievement. The ongoing evaluation itself is important because:

- Assessment helps the university establish academic accountability.
- Assessment is an integral part of a plan for college improvement.

To achieve these goals, the colleges use both direct and indirect assessment measures. Direct measures include such instruments as standardized tests and exams. Indirect measures include student surveys that reflect satisfaction with their educational experience and assess their preparation for employment or graduate and professional schools. Both measures supplement each other.

The learning-outcomes process and its related assessment procedures are published in print and electronic format and made available annually to students and faculty. Faculty share responsibility for assisting students in understanding these processes.

*NOTE: Though the results of student assessment are valuable tools in evaluating the effectiveness of PMU educational programs and provide guidance in modifying or improving programs, they are not used for assessing faculty performance. Faculty are assessed through processes created and implemented by their individual colleges in association with the Professional Development Center.*

## C. SUPPORT FOR THE OUTCOMES PROCESS

Coordination and organization are necessary to turn the university's outcome- and assessment-oriented educational approach into reality. Faculty, administrators, and students need support as

they work together to ensure success for the PMU's integrated learning experience.

1. **Professional Development Center / Learning Resources Center**

The central point in which all these activities come together is the PMU's Professional Development Center. However, it is necessary to make connections with other areas to ensure that the entire university is infused with programs and processes for developing PMU learning outcomes and competencies.

The Dean of the Core Curriculum, the Deans of the academic colleges, the director of Preparatory Year Program, the Director of the Professional Development Center, and the Director of the Learning Resources Center work closely together in support of this effort. (For descriptions of the duties and responsibilities of each of these university officials, see the report *PMU Organization.*) These university leaders ensure that the process is managed efficiently and effectively with regard to student record keeping, reporting, and similar administrative requirements. They also ensure that faculty agree on and follow pedagogical approaches that achieve the university's learning outcome-oriented goals.

The Professional Development Center and the Learning Recourse Center provide a distinct set of support services.

**a. Support for Students**

Using the student-oriented programs of the Learning Resources Center (LRC), the assessment program offers an environment in which students are constantly reinforced in developing PMU learning outcomes and competencies. Two examples of the many programs that can occur in the LRC are:

- Workshops designed for the Preparatory Year Program to enforce learning outcomes and behaviors as they assist students with their out-of-class assignments. (For more on these programs see the report *Preparatory Program Design*.)
- Upper-class students proficient in the subject matter taught in the University Core Curriculum, College Core Curriculum, or academic majors, use the LRC as a center for tutoring beginning students.

A complete description of the functions of the LRC is provided in the report *Learning Resources Center*.

**b. Support for Faculty**

The faculty-oriented programs of the PMU Processional Development Center assists in orienting faculty not familiar with the outcomes approach to this style of education. It coordinates training and certification of all instructors who assess students. It promotes improvement of the learning-outcomes program overall.

For the learning-outcomes process, however, the Professional Development Center provides more than teacher training. It provides a center where teachers discuss student needs, share instructional methods, agree upon and establish assessment criteria, and work out their own solutions to educational issues.

A learning-outcomes program requires faculty to:

- modify the common practice of independently setting goals and evaluating student performance.
- share responsibility for facilitating specific student learning.

- engage in cross-college discourse about ways to improve the learning assessment process.
- shift the emphasis from what they will teach students to designing learning experiences that will support the achievement of agreed upon institutional goals.

To achieve these goals, the PMU Professional Development Center coordinates professional development activities that focus on achieving faculty consensus concerning the interpretation of learning outcomes; developing common rules for students concerning the presentation and defense of their learning documents; and improving pedagogy and learning assessment processes.

## 2. Courseware Management System

The technology-infused and enriched environment of the PMU play a significant role in facilitating an outcomes- and assessment-based approach to university education.

### a. Support for Students

Using the university's courseware management system (CMS), students will be able to electronically assemble, present, and obtain assessment feedback on their assignments and projects, ongoing assessment programs, and long-term capabilities development. Among its many functions, the CMS enables students to:

- assess their own work and review their progress.
- engage in independent learning tasks and team-based projects, discussion forums, and file exchange.
- access current information for their courses.
- store cumulative records including work samples over time.

Students will be able to use the management system through graduation and beyond, providing employers rich information about the qualifications and qualities of the graduate as a prospective employee.

### b. Support for Faculty

Faculty is able to use the CMS to review and share materials and pedagogical strategies, interact with other faculty concerning course content and pedagogy, and work to improve the academic program. Among its functions, the CMS enable faculty to:

- enhance communication with students.
- share content from one course to another.
- create specific sequences of learning for courses.
- design and manage customized courses and activities based on prerequisites, prior work, or results of testing.

The CMS gives faculty powerful tools for managing multiple programs, along with skills and competencies.

For further information on the courseware management system proposed for the PMU, see the report *PMU Infrastructure Specifications*.

### c. Support for Common Goals

The CMS also enables a common course syllabus format, which provides students with easy access to information about course objectives and course alignment with university

learning outcomes. It allows faculty to review and share materials and pedagogical strategies. This sharing promotes faculty interaction about course content and pedagogy that result in improvement of the academic program.

A common format and publicly posted syllabi promotes consensus among faculty and students about learning priorities.

## IV. THE PMU ASSESSMENT CAPSTONE SERIES

### A. SERIES OVERVIEW

| Key | Title |
|---|---|
| ASSE 2111 | Learning Outcome Assessment I |
| ASSE 3211 | Learning Outcome Assessment II |
| ASSE 4311 | Learning Outcome Assessment III |

*6 semester hours – Required*

Every PMU student will take three credit-bearing courses associated with learning outcomes and assessments. These courses are offered during the students' sophomore, junior, and senior years. They begin with an orientation to the assessment process and build to a comprehensive program that incorporates all of the PMU learning outcomes.

As a condition of graduation, each student must successfully complete these three courses and demonstrate a mastery of PMU competencies and learning outcomes.

### B. SERIES COURSES

The Assessment Capstone Series includes the following three courses. Complete syllabi for these courses are found in Section VII., Course Syllabi.

#### 1. ASSE 2111: Learning Outcome Assessment I

This course is taken during the first semester in the sophomore year. It will orient students to learning-outcomes expectations, the development of a learning portfolio, and the assessment process. During the course, all students, regardless of major, will complete a set of projects that involve writing, oral presentations, decision-making, problem solving, and technology. The specifics of each assignment, however, will be tailored to the major. The course carries one hour of credit.

#### 2. ASSE 3211: Learning Outcome Assessment II

The course is taken during their first semester of the junior year. Building on ASSE 2111, the course will provide additional depth to learning-outcomes expectations, the development of a learning portfolio, and the assessment process. Like ASSE 2111, it will tailor assignments within the assessment framework so that they will be relevant to students' majors. This two credit-hour course will prepare students for the final capstone experience, ASSE 4311, which will fully integrate assessment of competencies with the major field of study.

3. **ASSE 4311: Learning Outcome Assessment III**

   This course is taken during either the first or second semester in the senior year, depending on the student's major degree program. It will require students to demonstrate the full range of PMU competencies and learning outcomes as they complete a capstone project under direction of their college faculty. Students will be expected to take full responsibility for planning, managing and completing a project that requires them to synthesize, integrate and apply their knowledge and skills to produce research or other creative or professional work. The course carries three hours of credit.

   At the culmination of ASSE 4311, a summative assessment of the student's satisfactory completion of PMU assessment requirements will be conducted and documented by the course instructors. A report of this assessment will be included in the student's permanent university record and must be approved by the dean of each student's college in consultation with Dean of the Core Curriculum Program before graduation.

## C. CAPSTONE ADMINISTRATION

The three courses in the Assessment Capstone Series are administered and housed in the office of the Dean of the Core Curriculum Program. In overseeing the series, the dean will work closely with the Director of the Professional Development Center, Director of the Learning Resources Center, Chair of the Core Curriculum, Associate Chair of the Core Curriculum, and deans, department chairs, and associate chairs of the academic colleges.

The Dean of the Core Curriculum Program is responsible for the following:

- Orientation of faculty, administrators, and students to the expectations of PMU learning outcomes and the process of assessment
- Coordination of faculty development in learning assessment
- Training and certification of faculty assessors
- Scheduling, assigning faculty, and coordinating ASSE courses
- Maintenance of official student assessment records
- Liaison with college deans and faculty

The Dean of the Core Curriculum, and the Chair and Associate Chair of the Core Curriculum will assign faculty from the staff of the Core Curriculum program to teach the first two assessment courses, ASSE 2111 and ASSE 3211. These faculty members may be specialists in assessment, or they may be members from the program's academic disciplines who have completed assessment training and achieved certification through the Professional Development Center. The faculty who teach ASSE 2111 and ASSE 3211 will work closely with faculty from the academic colleges to develop meaningful exercises that will gauge the extent to which students are achieving the eight university competencies.

The deans of the PMU colleges, in consultation with Dean of the Core Curriculum, will assign faculty from each college to teach the final assessment course, ASSE 4311.

As part of the program, each student will receive feedback from a diverse panel of assessors, also assigned by the dean. At the core of that panel will be two or more faculty members, one of whom has not instructed the student in a course. Other assessors may include university staff, upper level students, and community representatives.

Each college will establish the performance standards required of its students for graduation. Standards will take into consideration the requirements for successful professional performance in the field the student is preparing to enter.

The Professional Development Center will provide assistance to faculty in developing sequence and content for all assessment courses. The goal will be to collaboratively design pedagogy and content that will assist students to achieve course objectives. An ongoing curriculum development process will stimulate the improvement of the faculty's teaching methods and assessment skills and will ensure that assessment curriculum undergoes continuous improvement.

The Dean of the Core Curriculum Program will evaluate the performance of faculty assigned to teach ASSE 2111 and ASSE 3211. The deans of the academic colleges, together with the Dean of the Core Curriculum Program, will evaluate the performance of faculty assigned to teach ASSE 4311.

## D. ASSESSMENT PROCESS

In order for students to make steady and satisfactory progress toward gaining the required PMU learning outcomes and competencies, each must understand his or her level of achievement at any given time. The Assessment Capstone Series is designed to provide students with formal and informal feedback concerning their performance throughout their university careers. This three-step series also will ensure that students achieve the required performance levels before graduation.

### 1. Evaluation Exercises

As the student progresses through the three-step assessment process, exercises developed by faculty of the college in which the student is enrolled are used to determine student success in achieving PMU learning outcomes and competencies. Individual and group exercises are administered under standardized conditions. They are designed to simulate the skills and abilities from the PMU learning outcomes that are most essential for successful performance in the student's profession.

Assessment capstone exercises include:

- **In-Basket Exercise:** a variety of memos, letters, and documents of varying importance. Students will prioritize and respond to the documents.
- **Leaderless Group Discussion:** specific problems in which students are instructed to attempt to reach a consensus within a specified amount of time. This exercise measures qualities such as decision making, leadership, teamwork, cooperation, and interpersonal skills.
- **Oral Presentation Exercise:** an oral presentation, using technological tools, in which students must defend their positions and recommendations concerning a specific issue.
- **Role-Play Exercise:** a hypothetical problem dealing with a subordinate, irate citizen, or member of the community. This exercise measures skills such as communication, problem solving, and interpersonal relationships.
- **Written Report / Analysis Exercise:** a student is presented with a job-related topic and is instructed to write a report, position statement, or outline of a new policy.
- **Technology Inventory:** Ability to demonstrate the use of spreadsheets, hi-tech presentations, telecommunications, graphics, and the Internet.
- **Portfolio Development:** a strategically organized, written, and visual documentation and reflection of student performances and accomplishments over the four university years.

### 2. The Student Portfolio

As a culmination and a record of the evaluation activities contained in the Assessment

Capstone Series, each student will document his or her achievement of learning outcomes. The student portfolio will include work products or performance descriptions that the student has produced in class or during out-of-class or work-based activities.

Such work products might be class assignments, research or project reports, written feedback or evaluations from others (such as team mates and internship employers). The portfolio also can include documentation produced specifically for the portfolio, such as essays that faculty might assign on the capstone experience.

The portfolio will form one basis for the student's assessment report, which will be compiled by the student's advisory panel. A final assessment report covering all activities in the three courses of the series will become part of each graduating senior's permanent university record.

Equally important, the portfolio will become tangible evidence of achievements that the student can take to employers or others in the community. In compiling this documentation, students will make extensive use of the portfolio capabilities in the university's Courseware Management System (CMS). (For a discussion of CMS capabilities see Section III., Support for the Outcomes Process.) Even after graduation, the online portfolio will be available for students to access and utilize in their professional careers.

## V. THE PMU UNIVERSITY CORE CURRICULUM

### A. CURRICULUM OVERVIEW

| Key | Title |
|---|---|
| COMM 1311 | Written Communication |
| COMM 1312 | Writing and Research |
| COMM 2311 | Oral Communication |
| COMM 2312 | Technical and Professional Communication |
| UNIV 1211 | Professional Development and Competencies |
| UNIV 1212 | Critical Thinking and Problem Solving |
| UNIV 1213 | Leadership and Teamwork |

*18 semester hours – Required*

| Arabic Language and Islamic Studies | |
|---|---|
| **Key** | **Title** |
| ALIS 1211 | Introduction to Islamic Culture |
| ALIS 1212 | The Social System in Islam |
| ALIS 2211 | Linguistic Communication Skills |
| ALIS 2212 | Biography of Prophet Mohammad |

*8 semester hours – Required*

| Physical Education | |
|---|---|
| **Key** | **Title** |
| PHED 1111 | Active Living Styles |
| PHED 1112 | Healthy Behaviors & Management |

*2 semester hours – Required*

The University Core Curriculum is an approach to knowledge rather than the memorization of knowledge. It empowers students to deal with complicated issues by mastering both the intellectual and the practical. It develops the ability to think critically. It prepares students to become the creative problem solvers that today's and tomorrow's globally interdependent world will require.

The courses in the PMU University Core Curriculum give students a solid grounding in practical abilities. These courses, however, are practical not because they train students for employment. They are practical because they cultivate analytical skills, oral and written communication, decision making, ethics, leadership, and teamwork. Through the University Core Curriculum, PMU students will connect with the larger community as much as they do to the university.

Students in the University Core Curriculum make full use of diverse and inclusive pedagogical strategies as they prepare for the shifting knowledge, growing need for collaboration, and new ethical concerns that will characterize the 21st century.

## B. LEARNING OUTCOMES MEASUREMENTS

The University Core Curriculum enrolls students from the very beginning of their university experience. The first year of studies following the Preparatory Year Program, in fact, is taken up nearly entirely with these required courses and courses from the College Core Curriculum. It is intended that students complete courses in the University Core as soon as possible in order to achieve the grounding in PMU learning outcomes that will ensure their success in upper level courses. This grounding is necessary both for their major programs in the university's colleges and in the Assessment Capstone Series.

Courses in the University Core Curriculum focus on specific learning outcomes and competencies chosen to ensure students' later academic and professional success. Though some of these abilities is defined as particular courses at the beginning level, students are expected to extend and develop these abilities through all aspects of their university career. Instructors in all courses and at all levels are expected to teach classes, run activities, and create assignments that encourage and assist students in further developing the learning outcomes introduced in the University Core Curriculum.

In measuring whether or not students have achieved the desired PMU learning outcomes, the university assesses students' proficiency in a number of concrete functions that are necessary to success in both academic and professional environments. The functions include:

### 1. Clarity of Writing

The writing component of the program encourage and evaluate written expression of thought. It provides students with opportunities to explore ideas and build connections between content areas. Specifically, students will be able to:

- Demonstrate the capacity to use various writing forms, (for example, in-class responses, journals, notebooks, reports, argumentative essays, research papers, and others) to achieve the specific purposes of the course.
- Exemplify ethical writing practices (that is, avoid plagiarism and make use of an appropriate style of attribution and citation) in all forms of written communication.
- Demonstrate the capacity to effectively integrate multiple sources (primary and secondary, electronic and print) into writing assignments.
- Demonstrate improvements in written expression by utilizing techniques such as peer review, multiple drafts, and revising assignments following feedback.

### 2. Persuasive Speaking

The Core program develops students' skills of oral communication using activities that range from informal discussion to formal presentation. Specifically, students will be able to:

- Clearly state questions, concerns, and ideas so that both the instructor and other students can understand the speaker's intent.

- Verbally condense larger amounts of information into concise, condensed analysis.
- Discuss topics in various size groups in a manner that contributes to the group without overpowering others.
- Give a clear, organized and accurate oral presentation of course material (for example, summaries of readings, research projects, analyses of arguments, or persuasive speeches).

**3. Reasoned Thought**

This component develops students' reasoning abilities by incorporating reasoning tasks and practices into courses and assessments. Specifically, students will be able to:

- Identify and state arguments.
- Identify the main point in a passage or essay and state the reasons that support a given choice.
- Identify assumptions and state the implications of an argument, passage, or theory.
- Critically evaluate arguments in terms of the strength of evidence and reasoning.
- Write essays that come to well-reasoned conclusions and solutions, supported by relevant evidence and tested against relevant criteria and standards.

**4. Quantitative Analysis**

Students will develop their problem-solving abilities through the use of logic and reasoning. Assignments focus on identifying, analyzing, categorizing, and communicating quantitative relationships. Specifically, students will be able to:

- Translate problems into mathematical form.
- Construct and interpret visual representations of mathematical relationships.
- Determine quantitative relationships and solutions to problems.
- Clearly communicate quantitative relationships and solutions.
- Apply mathematical concepts to real world situations.
- Draw inferences from data that could be incomplete under conditions that are uncertain.

**5. Applied and Professional Research**

Assignments that require students to locate and use information that supplements information provided in courses ensure that PMU graduates can formulate researchable questions and identify resources, and utilize their findings. Specifically, students will be able to:

- Identify types of resources necessary to formulate a researchable question.
- Utilize credible resources as a tool for academic research.
- Draw conclusions based on the results of the research.
- Document research findings, using accepted forms of scholarly citation.
- Communicate the outcome of the research findings.

**6. Information and Computer Competencies**

All PMU courses incorporate components that assist students in acquiring basic skills to research and critically evaluate information with the use of information technology. Specifically, students will be able to:

- Determine the extent of information needed.
- Utilize computers to create documents and to retrieve and communicate information effectively and efficiently.
- Evaluate information and its sources critically.
- Incorporate selected information into the student's knowledge base.
- Use information effectively to accomplish a specific purpose.
- Understand many of the ethical, legal, and social issues surrounding the use of information sources.

# VI. THE PMU COLLEGE CORE CURRICULUM

## A. CURRICULUM OVERVIEW

### 1. Mathematics

| Key | Title |
|---|---|
| MATH 1311 | Finite Mathematics for Students of Business |
| MATH 1312 | Calculus for Students of Business |
| MATH 1313 | Statistical Methods |
| MATH 1321 | Pre Calculus Mathematics |
| MATH 1422 | Calculus I |
| MATH 1423 | Calculus II |
| MATH 1324 | Calculus III |
| MATH 2313 | Probability and Statistics |
| MATH 2331 | Linear Algebra |
| MATH 2332 | Differential Equations |
| MATH 3433 | Linear Algebra and Differential Equations |

*Colleges designate specific required courses, if any.*

### 2. Natural and Physical Sciences

| Key | Title |
|---|---|
| BIOL 1411 | Introductory Biology |
| CHEM 1411 | Introductory Chemistry |
| CHEM 1421 | Chemistry for Engineers I |
| CHEM 1422 | Chemistry for Engineers II |
| GEOL 1411 | Introductory Physical Geology |
| PHYS 1411 | Introductory Physics |
| PHYS 1421 | Physics for Engineers I |
| PHYS 1422 | Physics for Engineers II |

*Colleges designate specific required courses, if any.*

### 3. Social and Behavioral Sciences

| Key | Title |
|---|---|
| ECON 1311 | Introduction to Macroeconomics |
| ECON 1312 | Introduction to Microeconomics |
| GEGR 1311 | World Regional Geography |
| HIST 1311 | World Civilizations, 1500 – Present |
| PSYC 1311 | Introduction to Psychology |
| FREN 1311 | Introduction to French Language |
| SPAN 1311 | Introduction to Spanish Language |
| SUST 1311 | Introduction to Sustainability |

*Colleges designate specific required courses, if any.*

## B. SUBJECT AREA EXPERTISE

The PMU College Core Curriculum is designed to ground students in subjects that all competent, well-educated persons should master. The knowledge and skills gained in these courses will enhance their future ability to contribute to society, even if their chosen profession is a different field. As such, the number of credit hours designated for each area represents a minimum exposure that every PMU student should experience.

To accommodate the various needs of the university majors, the College Core Curriculum is designed to be flexible. While all students must take at a certain number of course from each of the three areas, the exact courses required, choices of electives, and requirements beyond the minimum number of credit hours will be specified by the degree programs for each major.

## C. SUBJECT AREA LEARNING OUTCOMES

By their nature, the three broad areas represented in the PMU College Core Curriculum – Natural and Physical Sciences, Mathematics, and Social and Behavioral Sciences – are well suited to instilling the desired PMU learning outcomes of critical thinking and problem solving.

The manner in which the PMU faculty address these subjects, working closely with instructors across disciplines and drawing upon resources provided by the Professional Development Center, will infuse the academic experience with skills in communication, technology, teamwork, and leadership.

Coordination among the College Core Curriculum, the University Core Curriculum, and the Assessment Capstone Series will reinforce each of the PMU learning outcomes and guide students toward the professional competencies they will need following graduation.

### 1. Mathematics

Mathematics provides an approach to problem solving through logic and reasoning. It is used to identify, analyze, generalize, and communicate quantitative relationships.

Learning outcomes for students completing the Mathematics requirement are:

- Knowing the fundamental notation and rules of a mathematical system.
- Recognizing problems to which mathematics can be applied.
- Translating problems into mathematical form.
- Being able to construct and interpret visual representations of mathematical relationships.
- Constructing logical and valid mathematical arguments.
- Determining mathematical relationships and solutions to problems.
- Communicating mathematical relationships and solutions.

### 2. Natural and Physical Sciences

The goal of the natural and physical sciences is to better understand nature. The natural and physical sciences systematically study natural phenomena. They do so by observing nature, by collecting and analyzing data, by forming, testing, and revising hypotheses, and by developing theories.

Learning outcomes for students completing the Natural and Physical Sciences requirements are:

- Understanding what the realm of science is, and why science is important to their lives.
- Comprehending current principles and theories used to explain natural phenomena and

understanding the role of theories in science.

- Seeing science as a process of conducting systematic observation, formulating and testing hypotheses, collecting and evaluating data, recognizing sources of error and uncertainty in experimental methods, and disseminating results.
- Developing an understanding of how human activity affects the natural environment.
- Making informed judgments about science-related topics and policies.

**3. <u>Social and Behavioral Sciences</u>**

The social and behavioral sciences are characterized by their application of both rational and empirical methods to studying the ways in which individuals, organizations, and societies are influenced by the environment as well as by personal and societal goals.

Learning outcomes for students completing the Behavioral and Social Sciences requirement will be:

- Being able to use a variety of theories to explain human behavior.
- Describing how the study of human behavior is founded on empirical and scientific observation.
- Recognizing the effects of the environment on individual behavior and recognizing the effects of social institutions and processes on human interaction.
- Understanding significant social, economic, and political developments in Western and non-Western history.
- Grasping the interaction of Western and non-Western cultural traditions.

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## D. GENERAL REQUIREMENTS FOR FACULTY

### 1. Subject Area Faculty

#### a. Responsibilities

Faculty assigned to teach in the Core Curriculum will have the primary teaching responsibilities for the college's academic courses. These include selecting texts, preparing course syllabi, planning in-class team activities, constructing student assessments, keeping grade records, supervising laboratory sessions, and holding regular office hours.

In addition, faculty in math, chemistry, and physics will write placement examinations that will be administered to students who wish to take certain courses in these fields. (For a discussion of the Core Curriculum faculty's involvement in the PMU admissions and placement process, see the report *PMU Admissions Plan*.)

#### b. Degrees and Experience

The faculty should hold a doctoral degree in the discipline in which they teach with at least two years of teaching experience at the college level. For faculty teaching lower level courses, a masters' degree with at least 18 graduate semester hours in the discipline in which they teach may be allowed, at the discretion of the Dean of the Core Curriculum and the chair of the academic department involved.

For all faculty, preference will be given to persons who possess prior experience in teaching in cooperative and collaborative learning.

#### c. English Language

Because the university is to teach students in English, all faculty must have achieved proficiency in the English language. Preference are given to faculty who are either native English speakers or have achieved native-level proficiency as demonstrated by a band score of 8.0 or higher on the IELTS, with minimum component test scores of at least 7.5.

#### d. Student-Centered Approach

For some faculty, student-centered learning may be a challenge that requires training, guidance, and support from the staff of the PMU Professional Development Center (to be described in the report, Professional *Development Center*).

Willingness to undertake professional development activities necessary to learn how to implement student-centered cooperative and collaborative methodologies therefore will be a necessity, along with sensitivity to Arab culture.

## 2. Assessment Capstone Series Faculty

### a. Responsibilities

Certain faculty within the Core Curriculum are assigned to teach the first two assessment courses, ASSE 2111 and ASSE 3211 in the Assessment Capstone Series. These faculty may be specialists in assessment, or they may be members from academic disciplines who have completed assessment training and achieved certification through the Professional Development Center. (For additional discussion of faculty responsibilities in the assessment series, see section IV. C. Capstone Administration of this report.)

As with subject-area faculty, these faculty members will be responsible for selecting texts, preparing course syllabi, planning in-class team activities, constructing student assessments, keeping grade records, supervising laboratory sessions, and holding regular office hours.

### b. Degrees and Experience

Assessment faculty should hold a doctoral degree with at least two years of teaching experience at the college level. Degrees for faculty who teach assessment courses only may be in any field (including specialties such as education or psychology). Masters degrees may be permitted in some instances, at the discretion of the Dean of the Core Curriculum.

### c. English Language

All faculty must have achieved proficiency in the English language. Preference are given to faculty who are either native English speakers or have achieved native-level proficiency as demonstrated by a band score of 8.0 or higher on the IELTS, with minimum component test scores of at least 7.5.

### d. Student-Centered Approach

PMU faculty who teach assessment courses will work closely with the staff of the Professional Development Center to develop and improve their assessment skills. They also will work with faculty from the colleges of engineering (including interior design), information technology, and business administration to assist in building and assessing the distinctive competencies that the PMU wishes its students to acquire.

In all faculty activities, willingness to undertake professional development activities necessary to learn how to implement student-centered cooperative and collaborative methodologies therefore will be a necessity, along with sensitivity to Arab culture.

## E. STUDENT/FACULTY RATIO

In order to enhance opportunities for class participation and individual attention, the student/ faculty ratio in the PMU Core Curriculum classes and labs are kept as low as possible.

Certain introductory courses may be taught via large lectures or a combination of large lectures and smaller sections. Calculus courses are taught via a combination of classes and smaller recitation sections.

| SUBJECT | Optimum In-Class Ratio | Optimum Lab Ratio | Maximum In-Class Ratio | Maximum Lab Ratio |
|---|---|---|---|---|
| **UNIV** | 25/1 | | 30/1 | |
| **ASSE** | 25/1 | | 30/1 | |
| **COMM** | 25/1 | | 30/1 | |
| **Lab Sciences, Social and Behavioral Sciences** | 70/1 Lecture<br>25/1 Class | 22/1 | 75/1 Lecture<br>30/1 Class | 24/1 |
| **Math** | 25/1 | | 30/1 | |

# VII. COURSE SYLLABI

## A. COURSE NUMBERING SYSTEM

A common system for naming courses is applied throughout all academic programs at the PMU. The system is structured as follows:

Each course title begins with four letters that indicate the subject matter of the course. In the report *Undergraduate Core Curriculum*, these letterings include:

- ASSE Assessment Capstone Series
- COMM Communications (written and oral), University Core Curriculum
- UNIV Learning Outcomes courses, University Core Curriculum
- BIOL Biology, College Core Curriculum
- CHEM Chemistry, College Core Curriculum
- GEOL Geology, College Core Curriculum
- PHYS Physics, College Core Curriculum
- MATH Mathematics, College Core Curriculum
- ECON Economics, College Core Curriculum
- GEGR Geography, College Core Curriculum
- HIST History, College Core Curriculum
- PSYC Psychology, College Core Curriculum
- FREN French, College Core Curriculum
- SPAN Spanish, College Core Curriculum
- SUST Sustainability, College Core Curriculum

The letters are followed by four numbers:

- First digit indicates the earliest year a course can be taken. A number 1 course may be taken at any time.
- Second digit indicates credit hours. Most courses carry 3 hours of credit. Science courses with labs carry 4 hours of credit. A small number of courses carry 1 or 2 hours of credit.
- Third digit indicates a course that is part of a group or family of courses. For example, the three general math courses are assigned the number 1 and the four calculus courses are assigned the number 2. More advanced math courses are assigned the number 3.
- Fourth digit serves only to differentiate courses from one another within a family. For example, the four calculus courses are numbered 1, 2, 3, and 4. The two economics courses are numbered 1 and 2.

# B. ASSESSMENT CAPSTONE SERIES

ASSE 2111: Learning Outcome Assessment I
ASSE 3211: Learning Outcome Assessment II
ASSE 4311: Learning Outcome Assessment III

**Course Title: ASSE 2111: Learning Outcome Assessment I**

**Semester Credit Hours:** 1 (1, 1)

## I Course Overview

Students take the course during their first semester in the second year of the undergraduate program It orients them to learning-outcome expectations, the development of a learning portfolio, and the assessment process.

## II PMU Competencies and Learning Outcomes

This course is first in a series designed to prepare students for the senior year capstone experience. Students learn fundamental concepts and tools used to enhance decision-making. Students work in teams to analyze problems, write and orally present a report. Students collaborate on group projects, utilizing digital resources to retrieve information and data needed. Students practice responsible and critical use of digital resources.

## III. Detailed Course Description

Students learn technologies, learning strategies, and key academic skills to support success in their program as they progress toward completion of the senior capstone project. Students also will employ alternative systems of thought and communicate effectively with others to arrive at solutions to complex problems.

## IV. Requirements Fulfilled

ASSE 2111 satisfies the first of three Assessment Capstone Series requirements.

## V. Required Prerequisites

This course does not have a prerequisite.

## VI. Learning Outcomes

Students will be able to:

- Explain Capstone purposes and describe how ASSE 2111, 3211, and 4311 contribute to and demonstrate their learning at the University.
- Develop greater facility with content and skills taught in other core courses.
- Prepare a first-year portfolio in addition to portfolios being prepared for individual courses.

## VII. Assessment Strategy

| | Assessment Task | Week Due | Weight |
|---|---|---|---|
| 1 | **Journal/Learning Logs**<br>Weekly journal logs tracking about personal experiences, learning, successes and struggles in the students' courses. These journals should show writing skill improvement, critical thinking, and analysis. | Weekly | 15% |
| 2 | **ePortfolio**<br>An online portfolio assessing student's own continuing work in the targeted competencies. This includes tests, papers, specific assignments, and/or research products from students' first year courses. These are collected into a portfolio that is evaluated at various stages during the course. | 16 | 30% |

| | | | |
|---|---|---|---|
| 3 | **Debriefing & Progress Report**<br>Students will visit four times with the instructor and/ or with the staff of the PMU student affairs academic counseling department at assigned intervals during the term to discuss progress in other courses. Students may receive individualized guidance and expectations from the instructor in response. *At the end of the semester students submit a progress report showing learning and career goals, progress or achievements, remaining questions,* and expected final outcomes/results. | 13 | 20% |
| 4 | **Attendance/Participation.**<br>The grade for participation/attendance will be determine by the quality and consistency of student's participation in the debriefing & lectures. | - | 5% |
| 5 | **Book chapter summary & presentation**<br>A Book Chapter Presentation (weekly group readings and joined presentations) and a Written Summary Report on same Chapter by group. Chapters/Readings taken from *Critical Thinking* Course Textbook. Written Summary Report (10pts); PowerPoint & Presentation (5pts) | 1-15 | 15% |
| 6 | **Examination**<br>ASSE2111 is a capstone course. As a result, exams will be designed to test students' literacy and knowledge of assessment, including three PMU competencies—global connectedness, critical thinking and problem solving, writing and grammar. Other competences—oral communication, professionalism, and teamwork and leadership will be assessed using major assignments. | 16 | 15% |
| **Total** | | | 100% |

## VIII. Course Format

**Classroom Hours** (2 hours per week) **Class:** 1
**Lab:** 1

## IX. Topics to Be Covered

A. Concepts of Assessment of learning and assessment for learning
B. Concepts of self assessment
C. Appying self assessment concepts
D. Critical thinking and its importance
E. Fair mindedness and intellectual virtues
F. Egocentrism, reasoning, elements of thought, intellectual standards.
G. Freedom, experience, intelligent decision making,
H. Research techniques

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have a computer account on the University's BLACKBOARD system, so the instructor and the students can communicate via email. Students should immediately sign up for the online discussion group for the class. Students are also expected to become familiar with the use of the Internet.

All assignments and projects are submitted online. Assignments focus on guided collaborative learning, media-assisted instruction, research projects, and laboratory and computer exercises. Students should check with their instructor in order to obtain the specific methods to be used in the course.

Office hours are available via audio and video for discussion of class materials. Even without a video camera, the audio on the computer can be used to discuss class issues.

**XII. Special Projects/Activities**

None.

**XIII. Textbooks and Teaching Aids**

A. Required Textbook

Paul, Richard W. and Linda Elder, *Critical Thinking – Tools for Taking Charge of Your Professional and Personal Life*, 2nd Edition, FT Press, 2013.

B. Alternative Textbooks

None.

C. Supplemental Print Materials

None.

D. Supplemental Online Materials

None.

**Course Title: ASSE 3211: Learning Outcome Assessment II**

**Semester Credit Hours:** 2 (2, 1)

**I. Course Overview**

Students take the course during the first semester in the third year. Faculty monitor student progress through their degree program, mentoring in their academic and professional growth, and build off their accomplishments in ASSE 2111. The course also prepares students for the final capstone experience – ASSE 4311.

The course assesses students' acquisition of the six PMU competencies. These serve to provide students a means of self-assessment of their academic status and career goals. The six defined competencies empower PMU students to be lifelong learners and advanced critical thinkers.

**II. PMU Competencies and Learning Outcomes**

Students encounter scenarios and problems common to the students' chosen major field/profession. Students employ critical thinking and analytical tools learned in their program to address those scenarios and problems.

The course helps prepare students for the senior year capstone experience. Course exercises employ teamwork to analyze a scenario/problem, devise solutions/responses, and to write and orally present a report.

Students collaborate on group projects, utilizing digital resources to retrieve information and data needed. Students practice responsible and critical use of digital resources.

**III. Detailed Course Description**

Students improve skills in the management of information and information technology. Students learn key concepts and procedural steps required for professional certification. Students will continue portfolio development in preparation for the final capstone sequence course. Students encounter real-life professional questions and problems and learn clearly and precisely formulate answers. Students think within alternative systems of thought and communicate effectively solutions to complex problems.

## IV. Requirements Fulfilled

ASSE 3211 satisfies the second of three Assessment Capstone Series requirements.

## V. Required Prerequisites

Students must have passed ASSE 2111 to take this course.

## VI. Learning Outcomes

Upon completion of ASSE 3211: Learning Outcome Assessment II students will have improved their abilities to:

- Employ leadership, teamwork, research, and critical thinking to solve problems and challenges common to their chosen field/profession.
- Explain requirements for certification in their chosen field/profession.
- Document their learning through personal portfolios with the goal of a strategically organized, written and visual documentation and reflection of their performances and accomplishments.
- Utilize spreadsheets, hi-tech presentations, telecommunications, graphics, and the Internet

## VII. Assessment Strategy

All of the following assignments are required for the course.

A. Portfolio Assessment (20% of grade)

Tests, papers, specific assignments, and/or research, products are collected into a portfolio that is evaluated at various stages in the course. Each student will prepare his/own portfolio.

B. Professional Certification Assignment (20% of grade)

Students research the steps required after graduation for professional certification. They present these steps and explain their personal pathway to accomplish these goals.

C. Scenario Assignments (60% of grade)

Working in a group, students will be given a common crisis or issue likely to arise in the students' chosen field. Together, they will research relevant facts, determine a course in response, and then present these findings to a panel of faculty. There will be three such projects in the course of the semester. The first is worth 10% of the grade; the second is worth 20%, and the final project is worth 30%.

| | Assessment Task | Week Due | Weight |
|---|---|---|---|
| 1 | **Portfolio Assessment—ePortfolio**<br>Tests, papers, specific assignments, and/or research, products are collected into a portfolio that is evaluated at various stages in the course. | 13 | 20% |
| 2 | **Professional Certification Assignment**<br>Students will research the steps required after graduation for certification in their chosen profession. They will then present these and describe the steps necessary for them to accomplish these goals. | 6 | 20% |
| 3 | **Scenario Assignments (WebQuest)**<br>Working in a group, students will be given a common crisis or issue likely to arise in the students' chosen field. Together, they will research relevant facts, determine a course in response, and then present these findings to a panel of faculty. There will be three such projects in the course of the semester.<br>a. Project 1 (1-2 page report and presentation—to be completed during Week # 4)= 1**0%**<br>b. Project 2. (3-page report and presentation—to completed during Week # 8) = **20%**<br>c. Project 3 (5-6 page report/presentation and WEBQUEST—to be completed during week # 12)= **30%.** | 10 | 60% |
| **Total** | | | **100%** |

## VIII. Course Format

Students are expected to attend all classes, read the assigned material before class, and spend an average of two hours per week outside of class for every hour of lecture. These are minimum expectations. The class consists of lectures, group assignments and projects, and online discussions. Assignments alternate among lectures, group assignments and projects, and online discussions. Assignments are due approximately every second or third week. All assignments and projects should be done as part of a group.

An online discussion group is set up to discuss the topics of the course outside of the classroom. Students are required to actively participate in this online discussion forum to obtain ideas and information about interesting new ideas, to discuss current policy issues, and to elaborate on materials presented in class. The instructor contributes regularly to the discussion and replies to questions asked and comments offered.

A list of the number of hours for each type of instruction follows, as below:

**Classroom Hours** (3 hours per week) **Class:** 2
**Lab:** 1

## IX. Topics to Be Covered

A. Problem/crisis management in the workplace
B. Steps in the professional certification process
C. Written and oral communication
D. Critical thinking and problem solving
E. Quantitative analysis
F. Research
G. Information and computer literacy

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have a computer account on the University's BLACKBOARD system, so that the instructor and the students can communicate via email. Students should immediately sign up for the online discussion group for the class. Students are also expected to become familiar with the use of the Internet.

All assignments and projects are submitted and examinations are taken online. Assignments focus on guided collaborative learning, media-assisted instruction, research projects, and laboratory and computer exercises. Students should check with their instructor in order to obtain the specific methods to be used in the course.

An online discussion group is set up to discuss the topics of the course outside of the classroom. Students are required to actively participate in this online discussion forum to obtain information about interesting new ideas, to discuss current policy issues, and to elaborate on materials presented in class. The instructor contributes regularly to the discussion and replies to questions asked and comments offered.
Office hours are available via audio and video for discussion of class materials. Even without a video camera, the audio on the computer can be used to discuss class issues.

## XII. Special Projects/Activities

None.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

1. Paul, Richard W. and Linda Elder, *Critical Thinking – Tools for Taking Charge of Your Professional and Personal Life*, 2nd Edition, FT Press, 2013.

B. Alternative Textbooks

None.

C. Supplemental Print Materials

None.

D. Supplemental Online Materials

As provided by the publisher

**Course Title: ASSE 4311: Learning Outcome Assessment III**

**Semester Credit Hours:** 3 (3, 0)

## I. Course Overview

Students take this course either first or second semester of their fourth year. The student's major field of study determines which semester. This course building upon ASSE 3211. Students complete a summative group project encapsulating their undergraduate learning. Students also complete an individual portfolio for graduation as a part of this course. The course requires students to meet all the university learning objectives.

## II. PMU Competencies and Learning Outcomes

ASSE 4311 provides a unifying educational experience, tying together various strands of learning students have experienced during their studies. Students practice learned concepts and tools. Students demonstrate their achievement of learning-outcome requirements. Course exercises require students to work as a team to analyze a problem, then write and orally present a report.

Students collaborate on group projects, utilizing digital resources to retrieve information and data needed. Students practice responsible and critical use of digital resources.

## III. Detailed Course Description

Students demonstrate grasp of University learning outcomes through a group project, incorporating elements of all their coursework to date. Students exercise professional standards and ethics. The project will also require students to practice intercultural awareness in pursuit of a solution to their particular problem/issue.

## IV. Requirements Fulfilled

ASSE 4311 satisfies the third of three Assessment Capstone Series requirements.

## V. Required Prerequisites

Students must have passed ASSE 2111 and ASSE 3211 to take this course.

## VI. Learning Outcomes

Students will be able to:

- Complete a strategically organized, written and visual documentation and reflection of their performances and accomplishments.
- Demonstrate learning from each undergraduate course within this project.
- Demonstrate mastery of each of the six University learning outcomes.
- Assess, research, develop solutions for a significant workplace challenge by working effectively together.
- Present those solutions in a clear, concise, and informative manner.
- Demonstrate mastery of spreadsheets, hi-tech presentations, telecommunications, graphics, and the Internet.

## VII. Assessment Strategy

The following assignments are set for the course:

A. Portfolio Assessment (20% of grade)

Students collect tests, papers, specific assignments, and/or research products into a portfolio evaluated at various stages in the course. This is an individual assignment.

B. Professional Research Presentation (80% of grade)

Students working in groups will be given a scenario modeled on real-life situations likely or possible in their professional lives. Scenarios will require the use of intercultural awareness, research, analysis, and presentation skills.

Students will learn from each of their courses in the presentation. To assist in moving students through the process, the assignment will be broken into several steps. Students present the final product to peers, a panel of faculty, and persons currently working in the field.

## VIII. Course Format

Students are expected to attend all classes, read the assigned material before class, and spend an average of two hours per week outside of class for every hour of lecture. These are minimum expectations. The class consists of lectures, group assignments and projects, and online discussions. Assignments alternate among lectures, group assignments and projects, and online discussions. Assignments are due approximately every second or third week. All assignments and projects should be done as part of a group.
An online discussion group is set up to discuss the topics of the course outside of the classroom. Students are required to actively participate in this online discussion forum to obtain ideas and information about interesting new ideas, to discuss current policy issues, and to elaborate on materials presented in class. The instructor contributes regularly to the discussion and replies to questions asked and comments offered.

A list of the number of hours for each type of instruction follows, as below:

**Classroom Hours** (3 hours per week)

**Class:** 3
**Online discussion:** 2

## IX. Topics to Be Covered

A. Written and oral communication
B. Critical thinking and problem solving
C. Quantitative analysis
D. Research
E. Information and computer literacy
F. Intercultural awareness
G. Shared competencies
   1. Coaching
   2. Consulting
   3. Critical thinking and problem solving
   4. Group facilitation
   5. Leadership
   6. Persuasion and influence
   7. Project management
   8. Self-management
   9. Visioning
   10. Work collaboration
H. Technology competencies
   1. Strong proficiency in personal computer use *(i.e.*, word processing, spreadsheets, presentation, database, internet, email)
   2. Basic programming and principles of database development and management

3. Project management fundamentals

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have a computer account on the University's BLACKBOARD system, so that the instructor and the students can communicate via email. Students should immediately sign up for the online discussion group for the class. Students are also expected to become familiar with the use of the Internet.

All assignments and projects are submitted and examinations are taken online. Assignments focus on guided collaborative learning, media-assisted instruction, research projects, and laboratory and computer exercises. Students should check with their instructor in order to obtain the specific methods to be used in the course.

An online discussion group is set up to discuss the topics of the course outside of the classroom. Students are required to actively participate in this online discussion forum to obtain ideas and information about interesting new ideas, to discuss current policy issues, and to elaborate on materials presented in class. The instructor contributes regularly to the discussion and replies to questions asked and comments offered.

Office hours are available via audio and video for discussion of class materials. Even without a video camera, the audio on the computer can be used to discuss class issues.

## XII. Special Projects/Activities

None.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

None.

B. Alternative Textbooks

None.

C. Supplemental Print Materials

None.

D. Supplemental Online Materials

None

# C. UNIVERSITY CORE CURRICULUM

| | |
|---|---|
| COMM 1311: | Written Communication |
| COMM 1312: | Writing and Research |
| COMM 2311: | Oral Communication |
| COMM 2312: | Technical and Professional Communication |
| UNIV 1211: | Professional Development and Competencies |
| UNIV 1212: | Critical Thinking and Problem Solving |
| UNIV 1213: | Leadership and Teamwork |

**Course Title: COMM 1311: Written Communication**

**Semester Credit Hours:** 3 (3, 0)

## I. Course Overview

This course introduces students to writing as process and product. Students will learn invention, selection, arrangement, presentation, and revision as parts of the writing process leading to compositions that are clear, concise, and correct. The course will also teach students to identify and correct errors in written communication, with an emphasis on grammar, mechanics, and proper manuscript form.

## II. PMU Competencies and Learning Outcomes

Effective writing is an indispensable component of communication. Professionals are expected to express thoughts, plans, observations, and strategies clearly and correctly. The focus of this course is the development of these abilities in individual students to prepare them for effective participation in their future professions. Effective writing requires analysis of materials and audiences and the development of appropriate strategies of presentation and persuasion. Peer review and editing, as well as collaborative writing projects, require the practice of cooperation, mutual support, and teamwork. Technology will play a central role in the instructional strategy, both in and out of the classroom.

## III. Detailed Course Description

Students will learn the concept of writing with a purpose for a specific audience, the importance of critical reading and thinking to the production of effective writing, and the basic principles and processes of exposition, exploration, and persuasion. Students will learn by reading high quality prose of various types and by writing. Students will be introduced to the writing process, grammatical sentence construction, stylistic choices, effective and appropriate word choice, conventions of punctuation and mechanics, varieties of manuscript form, and manuscript preparation using word processing software. Students will also learn principles of academic integrity that will inform their work at the University and in life.

## IV. Requirements Fulfilled

This course is a required University Core course for all students. All students will take this course during the first semester of the first year of undergraduate study.

## V. Required Prerequisites

This course does not have a prerequisite.

## VI. Learning Outcomes

Students will be able to:

- Recall the specific steps of essay writing: invention or prewriting, selection, arrangement or organizing, presentation or drafting, revision, editing, and proofing including audience, purpose, and style.
- Produce proper grammar, sentence mechanics, and organization strategies for written compositions.
- Demonstrate the ability to write a professional essay informing, explaining or describing.
- Demonstrate the ability to write a professional essay defining or exploring a subject or persuading the reader.
- Appraise the different levels of plagiarism, establish best practices for academic integrity, and communicate them to others.

## VII. Assessment Strategy

Students will be evaluated by their reading comprehension, grammar and sentence construction, paragraph organization, and overall writing effectiveness. Active listening and appropriate participation is central to any communication course, and these skills will be evaluated. There will be several papers, each about 400 words. One paper can be evaluated by a peer as well as by the instructor. The peer evaluations will be reviewed, first by the writer, who will make appropriate revisions in response to the peer evaluation, and then by the instructor. An in-class midterm writing assignment and final paper will also be required.

| | Assessment Task | Weight |
|---|---|---|
| 1 | Essays informing or explaining | 15% |
| 2 | Essay defining or exploring | 15% |
| 3 | Essays persuading the reader | 15% |
| 4 | Essay describing a subject | 15% |
| 5 | Participation | 10% |
| 6 | Midterm | 15% |
| 7 | Final | 15% |
| **Total** | | **100%** |

In consultation with the instructor, students will select their best or most representative paper, as well as the final in-class paper, to be included in the cumulative portfolio that will be part of the Assessment Capstone Series.

## VIII. Course Format

Students will attend three one-hour lecture/discussion sessions per week.

The course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Course calendar
- Course e-mail utility

- Course discussion list
- Peer review utility

**Classroom Hours** (3 hours per week) **Class:** 3

**Lab:** 0

## IX. Topics to Be Covered

A. General concerns of written communication
   1. Finding a subject – invention
   2. Limiting a subject – selection
   3. Organizing – arrangement
   4. Drafting – presentation
   5. Editing, proofing, and rewriting – revision

B. Clear and correct written communication
   1. Grammar and sentence mechanics
   2. Levels of diction – slang, standard, and non-standard English
   3. Introductions, body paragraphs, and conclusions
   4. Paragraph unity
   5. Paragraph coherence
   6. Transitions
   7. Reiteration, elaboration, and summary
   8. Citation conventions and manuscript form

C. Forms of written communication
   1. Informing
   2. Explaining
   3. Describing
   4. Defining
   5. Exploring
   6. Persuading

D. Critical thinking
   1. Identifying an idea
   2. Analyzing an argument
   3. Rules of analysis and interpretation

E. Writing and Community
   1. Writing purpose and audience
   2. Writing as collaborative work
   3. Writing as discovery of commonality
   4. Writing, plagiarism, and academic honesty

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Technology will be an integral part of the course as students use word processing, e-mail, and the University's BLACKBOARD system to write, peer review, revise, and submit their written assignments. Students will be required to utilize a technology learning center staffed by writing tutors.

## XII. Special Projects/Activities

None

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Arlov, Pamela, *Wordsmith: A Guide to College Writing*, 6th or 7th Edition, Longman, 2018.

B. Alternative Textbooks

McWhorter, Kathleen, *College Reading and Study Skills*, 12th or 13 th Edition, Pearson 2018.

Boardman, Cynthia A., *Writing to Communicate 3: Essays and the Short Research Paper*. Pearson, 2009.

C. Supplemental Print Materials

Axelrod, Rise B., and Charles R. Cooper, *St. Martin's Guide to Writing*, 11th Edition, Bedford/St. Martin's, 2018.

Langgan, John, *10 Steps to Advancing College Reading Skills.* Townsend, 2014 Press.

D. Supplemental Online Materials

As provided by the publisher

**Course Title: COMM 1312: Writing and Research**

**Semester Credit Hours:** 3 (3, 0)

## I. Course Overview

This course continues the work of assisting students to develop, organize, and express insights, observations, and ideas effectively, but in the context of planning and composing a formal research paper. In the course of doing research for a 2000-2500-word paper, students will learn to use computer databases and online sources as well as library materials and will significantly sharpen their analytical reading, critical thinking, and writing skills.

## II. PMU Competencies and Learning Outcomes

Effective communication requires not only the ability to gather, organize, and report information, but also to suggest methods of interpreting, using and taking action in response to that information. Professionals are expected to express well-researched information clearly and correctly in writing. The research and writing process requires the identification, analysis, and response to a problem, the discovery of something new, and the understanding of material at a deep and profound level. Individual students will gain ability and confidence in the construction of research-driven writing so as to better serve their future professions and employers.

## III. Detailed Course Description

The course will emphasize critical reading, thinking, and writing in the context of a comprehensive research project. Beginning researcher-writers will be introduced to the nature, uses, and objectives of research and its presentation. Students will learn to plan, organize, and draft a research paper that poses a problem and offers a compelling response or a convincing solution. The focus should be on an issue that reflects personal interests, commitments, and experience. Students can gain additional practice in peer evaluation and revision of their work and the work of others. Topics to be covered include the craft of research, correct modes of citation and standard manuscript form, as well as a reinforcement of strategies of exposition, organization, development, and persuasion. Academic honesty will be of paramount concern throughout the course.

## IV. Requirements Fulfilled

This course is a required University Core course for all students. All students will take this course

during the second semester of the first year of undergraduate study.

## V. Required Prerequisites

COMM 1311: Written Communication

## VI. Learning Outcomes

Students will be able to:

- Describe and explain the necessity of research and demonstrate knowledge of types of research and research tools.
- Develop a research proposal that addresses and assesses a contemporary or historical problem.
- Apply basic research skills in both print and electronic media and develop a relevant thesis for their research.
- Assess information for its validity and be able to compare data from different sources and attribute it properly to avoid plagiarism.
- Demonstrate the ability to write an informative and persuasive research paper by planning and organizing information.

## VII. Assessment Strategy

Students will proceed by steps to build their paper through the process of topic formulation, research, drafting of a thesis and introduction, and final submission of a paper. Active listening and appropriate participation is central to any communication course, and these skills will be evaluated. Certain key parts of the research process can be evaluated by a peer as well as by the instructor. The peer evaluations will be reviewed, first by the writer, who will make appropriate modifications in response to the peer evaluation, and then by the instructor.

| Assessment Task | Weight |
|---|---|
| Assignment 1: Research Proposal | 10% |
| Assignment 2: Annotated Bibliography | 10% |
| Assignment 3: Thesis and Introduction | 10% |
| Assignment 5: Final Paper—including Thesis and introduction, body (methodology/design, review of literature, findings), conclusion. | 20% |
| Assignment 6: Paper presentation | 10% |
| Participation/Attendance | 10% |
| Midterm Exam | 15% |
| Final Exam | 15% |
| **Total** | **100%** |

## VIII. Course Format

Students will attend three one-hour lecture/discussion sessions per week.

The course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Course calendar
- Course e-mail utility
- Course discussion list
  - Peer review utility

**Classroom Hours** (3 hours per week) **Class:** 3
**Lab:** 0

## IX. Topics to Be Covered

A. Using research
   1. Why do research?
   2. Discovering
   3. Informing
   4. Persuading

B. Posing problems, asking questions, finding answers
   1. Choosing a subject
      a. Interests
      b. Experiences
      c. Questions
      d. Problems
   2. From interest to topic
   3. From broad topic to narrow topic
   4. From narrowed topic to question
   5. Seeing the significance of the question
   6. From question to hypothesis
   7. From hypothesis to thesis

C. Finding sources
   1. Interviewing
   2. Working with librarians
   3. Locating books
   4. Locating periodicals
   5. Using computer databases
   6. Locating reliable Internet sources
   7. Locating additional library resources

D. Analyzing, evaluating and "owning" sources
   1. Sizing-up potential sources
   2. Reading for understanding
   3. Underlining, annotating, asking questions, and drawing inferences
   4. Summarizing
   5. Note-taking
   6. Quoting and paraphrasing
   7. The problem of plagiarism at the note-taking stage

E. Making arguments: claims and warrants
   1. Conversations and arguments
   2. Claims and evidence
   3. Making strong claims
   4. Offering reliable evidence
   5. Warrants as basis of reasoning and belief
   6. Modifying an argument
   7. Completing an argument
   8. Avoiding irrational claims and other pitfalls

F. Preparing to draft the paper
   1. Organizing note cards
   2. Planning the paper
   3. Organizational strategies / alternatives to outlines
   4. Drafting a prospectus

G. Drafting an introduction
   1. Elements of an introduction

2. State the problem or question
3. Create shared understanding
4. State the thesis or answer

H. Drafting the paper
1. Creating a revisable (rough) draft
2. Reviewing: selecting and using quotations and paraphrases
3. Integrating sources into paragraphs
4. Using tables, charts, and graphs
5. Connecting words and pictures
6. Foregrounding the structure of the paper

I. Revising the draft
1. The key to revision: thinking like a reader
2. Revising the organization
3. Revising the argument
4. Revisiting the thesis
5. Improving style
6. Proper use of passive voice.
7. Clarifying diction
8. Correcting grammar and sentence mechanics

J. Acknowledging sources
1. Acknowledging information
2. Acknowledging ideas found in sources
3. Academic integrity and dishonesty
4. Research and ethics

K. Preparing the final manuscript
1. The mechanics of manuscript preparation using a word processor
2. Basic forms of documenting sources

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Technology will be an integral part of the course as students use word processing, e-mail, and as the University's BLACKBOARD system to research, write, peer review, revise, and submit their paper. Students will be required to utilize a technology learning center staffed by writing tutors.

## XII. Special Projects/Activities

None

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Lester, James D., Writing Research Papers, 15th Edition, Longman, 2014.

B. Alternative Textbook

Booth, Wayne C., Gregory G. Colomb, and Joseph M. Williams, *The Craft of Research,* 4rth Edition, Chicago: University of Chicago Press, 2016.

C. Supplemental Print Materials

None

D. Supplemental Online Materials

- A useful site that addresses principles of academic integrity is: http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml
- As provided by the publisher

**Course Title: COMM 2311: Oral Communication**

**Semester Credit Hours:** 3 (3, 0)

## I. Course Overview

This course assists students in the development and presentation of clear, cogent, and compelling oral presentations. Students will learn to evaluate ideas and evidence, to think critically, and to communicate effectively in group situations. Students will also learn and practice theories of interpersonal communication to facilitate their growth in group interaction. A major oral presentation can be based on the written research project completed for COMM 1312: Writing and Research.

## II. PMU Competencies and Learning Outcomes

In order to be effective at communication (speaking and listening), a good communicator must be able to relay a message to an audience, organize it, and present it in a coherent, pleasing, and persuasive manner. A communicator must also develop the skills to become an active listener, practice listening for information, and become a critical and empathic listener where appropriate. Professionals are expected to express ideas and insights clearly and correctly in group settings and provide effective presentations in both formal and informal situations. Developing an oral presentation requires the gathering, analysis, evaluation, and organization of information. Students must exercise critical judgments about what is important to particular communication situations and what presentation strategies will be most effective. Oral presentations entail collaborative activities and consist of active listening encompassing constructive critique as an integral part of the curriculum. Group communication can act as a team-building process, leaders in and outside of the work place must become effective oral communicators in a variety of settings and be able to adapt style and content to different occasions. Technology will play a central role in the instructional strategy, both in and out of the classroom, and students will learn to implement technology within their presentations.

## III. Detailed Course Description

Oral Communication is a course designed to assist students to increase their skills in communication at home, school, and work, including small group and team communication, organizational communication, and electronic communication. Students will learn key terms and concepts and will employ verbal and nonverbal communication in a variety of settings, including interpersonal, group, and public situations, both formal and informal. Students will also be introduced to communication processes and theory and will apply theoretical knowledge to real-life situations, learning to make use of technology for clarity and impact. Active listening, intrapersonal cognitive processes, and peer evaluation are important components of the course.

## IV. Requirements Fulfilled

This course is a required University Core course for all students. All students will take this course during the first semester of the second year of undergraduate study.

## V. Required Prerequisites

COMM 1312: Writing and Research

## VI. Learning Outcomes

Students will be able to:

- Explain the parts of the listening process, such as active listening for information, critiquing, and showing empathy.
- Deliver oral presentations with a clear, identifiable purpose, with a logical organizational structure with smooth transitions from point to point, using convincing arguments and evidence.
- Deliver oral presentations using appropriate physical positioning, posture, eye contact and gestures.
- Develop an understanding of interpersonal communication, including roles, relationships, and expectations.
- Demonstrate the ability to make professional presentations using appropriate multimedia devices increasing audience attention and comprehension.

## VII. Assessment Strategy

Students will make several oral presentations, possibly a substantial presentation based on the research project completed for COMM 1312: Writing and Research. The presentations may consist of a speech of tribute, an informative speech, a persuasive sales-type speech, a presentation as a member of a group, and the longer research presentation. Students will be required to use PowerPoint or a similar technological aide in at least one of the presentations.

All presentations require an outline and, if outside sources are used, a bibliography. Active listening and appropriate participation is central to any communication course, and these skills will be evaluated. Students can be required to submit peer evaluations of presentations by different presenters, one of each kind, and these peer evaluations will be reviewed, first by the presenter, who will offer a response, and then by the instructor.

One presentation can be videotaped, recorded on a CD or DVD, and placed in the cumulative portfolio that will be part of the Assessment Capstone Series.

| | Assessment Task | Weight |
|---|---|---|
| 1 | Information/Introductory Speech Presentation | 10% |
| 2 | Persuasive Speech Presentation | 15% |
| 3 | Group presentation on conflict management and how to be globally connected | 15% |
| 4 | Group research project and presentation | 20% |
| 5 | Listening and participation/Attendance | 10% |
| 6 | Midterm exam | 15% |
| 7 | Final exam | 15% |
| **Total** | | **100%** |

## VIII. Course Format

Students will attend three one-hour lecture/discussion sessions per week. Over the course of the term, approximately 25 hours of class time will be set aside for oral presentations by members of the class.

The course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Course calendar
- Course e-mail utility
- Course discussion list

- Peer review utility

**Classroom Hours** (3 hours per week) **Class:** 3
**Lab:** 0

## IX. Topics to Be Covered

A. Foundations of communication
   1. Basic communication principles
   2. The variety of oral communication
   3. Audiences and occasions
   4. Self-concept, self-esteem, and communication
   5. Communication apprehension and performance anxiety
   6. Levels of formality
   7. Nonverbal communication
   8. Speaker-listener relationships

B. Public speaking
   1. Organizing oral presentations
   2. Introduction, body, conclusion
   3. Researching for oral presentations
   4. Using supporting materials
   5. Outlining
   6. Preparing and practicing speeches
   7. Developing and using visual aids
   8. PowerPoint strengths and weaknesses
   9. Speeches of tribute
   10. Informative speeches
   11. Persuasive speeches
   12. Dealing with audience questions

C. Interpersonal and group communication
   1. Active listening, empathic listening
   2. Problem solving and decision making
   3. Leadership and group roles
   4. Developing interpersonal relationships
   5. Dealing with trouble in interpersonal relationships
   6. Conflict management and assertiveness
   7. Gender and cultural issues in communication

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Technology will be an integral part of the course as students use word processing, e-mail, and the University's BLACKBOARD system to research, outline, rehearse, and review their oral presentations. In addition, students are required to use PowerPoint or another technological aide in at least one of their presentations. Peer reviews of presentations and responses to these reviews can be communicated online, and the group presentation will require extensive use of the discussion list utility. The Research Presentation, based on the Research Project completed for COMM 1312, can be videotaped and recorded on appropriate media for inclusion in the student's cumulative learning portfolio.

## XII. Special Projects/Activities

None

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Beebe, Steven A., Susan. J. Beebe, and Diana K. Ivy, *Communications: Principles for a Lifetime,* 6th Edition, Prentice Hall, 2012.

B. Alternative Textbooks

None

C. Supplemental Print Materials

None

D. Supplemental Online Materials

None

**Course Title: COMM 2312: Technical and Professional Communication**

**Semester Credit Hours:** 3 (3,0)

## I. Course Overview

This course builds on the writing and communication skills students developed in COMM 1311, 1312, and 2311. Each student will learn a variety of technical and professional writing techniques. Students will construct a professional resume, business letters, technical papers, memoranda, and will work in teams and use technology to produce reports and presentations.

## II. PMU Competencies and Learning Outcomes

Professionals in today's workplace must be able to communicate in a variety of ways, including writing, speaking, and active listening. They must be able to participate in effective meetings, write useful reports, and develop compelling presentations. Professionals are expected to express ideas and insights clearly and correctly in group settings and to give effective presentations in both formal and informal situations. Students will learn to read, analyze, and synthesize technical and business materials and to exercise critical judgments about what is important to particular situations in the workplace. Communication in the workplace, unlike academic writing, is typically collaborative, and requires cohesive working within groups or on teams. Students will learn how to conduct effective interviews, run effective meetings, and provide direction for a business or political entity through written and oral communication. Technology will play a central role in the instructional strategy, both in and out of the classroom, students will learn to implement technology in oral and written presentations and within their collaborative work.

## III. Detailed Course Description

Communication in the workplace is generally characterized by organizational interdependence, collaboration, and teamwork. Development of individual skills and abilities is essential for any successful collaboration and teamwork. This course will introduce students to the techniques that are required to manage technical and professional communication opportunities and challenges. Topics to be covered include: adapting a message to an audience and an occasion, the mechanics of writing (grammar, sentence mechanics, transitions, organization and structure, paragraph unity and coherence, effective and appropriate word choice, proper punctuation, etc.); and the conventions of writing in professional settings (resumes, letters, memos, reports). The course will also address global, multicultural, and gender issues, ethical and political issues, and the place and increasing importance of technology in workplace communication.

## IV. Requirements Fulfilled

This course is a required University Core course for all students. All students will take this course during the second semester of the second year of undergraduate study.

## V. Required Prerequisites

- COMM 1311: Written Communication
- COMM 1312: Writing and Research
- COMM 2311: Oral Communication

## VI. Learning Outcomes

Students will be able to:

- Describe and explain interpersonal communication and explain the ethical issues inherent in communication.
- Design audience-oriented documents including resumes, memorandums, letters, and reports.
- Demonstrate the goal-oriented nature of communication.

- Design, develop and present a business proposal for a professional project.
- Demonstrate collectively the ability to design, develop, and deliver technical manuals

## VII. Assessment Strategy

Students will submit workplace documents and make oral presentations, including a substantial analytical presentation. The presentations, which will include visuals and graphics (i.e. PowerPoint format) will include a business project proposal. Active listening and appropriate participation are central to any communication course, and these skills will be evaluated. Students can be required to submit peer evaluations of three documents by different colleagues. Each of these peer evaluations will be reviewed, first by the student, who will revise the document with the peer evaluation in mind, and then by the instructor.

| | Assessment Task | Weight |
|---|---|---|
| | Job Application Letter and Resume | 10% |
| | Customer Relations Letter/ Letter of Complaint | 10% |
| | Midterm exam | 15% |
| | Technical Manual (collaborative). Ex: Students develop a user manual for a product. | 20% |
| | Business Proposal (collaborative) | 20% |
| | Participation & Attendance | 10% |
| 7. | Final exam | 15% |
| **Total** | | **100%** |

The Business Project Proposal can be videotaped, recorded on a CD and/or DVD, placed in a cumulative portfolio that will be part of the Assessment Capstone Series. The resume will become a part of each student's portfolio.

## VIII. Course Format

Students will attend three one-hour lecture/discussion sessions per week. Over the course of the term, approximately 15 hours of class time will be set aside for presentations by members of the class.

The course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Course calendar
- Course e-mail utility
- Course discussion list
- Peer review utility

**Classroom Hours** (3 hours per week) **Class:** 3
**Lab:** 0

## IX. Topics to Be Covered

A. Basics of business and professional communication
   1. Interpersonal communication in the workplace
   2. Nonverbal communication in the workplace
   3. Small groups and teambuilding
   4. Leadership and communication
   5. Intercultural communication in the workplace

6. Communication conflict and its resolution

B. Basics of technical writing
   1. Audience recognition
   2. Document design
   3. Graphics and images
   4. Technical description
   5. Technical instructions
   6. User's manuals
   7. Grammar, punctuation, mechanics, and spelling

C. Professional writing in the workplace
   1. Job searches
      a. Cover letters
      b. Resumes
   2. Letters of recommendation
   3. Personnel evaluations
   4. Customer relations and complaints
   5. Research and analysis
   6. Writing business plans and proposals

D. Professional presentations in the workplace
   1. Internal vs. external presentations
   2. Presentational and technical skills
   3. Presenting to inform and analyze in the workplace
   4. Presenting to persuade in the workplace
   5. Sales presentations in the workplace

E. Issues of importance to communication in the workplace
   1. Active listening in the workplace
   2. Gender roles and communication
   3. Corporate cultures and communication styles
   4. Communication networks or cliques in the workplace
   5. Office politics and ethics in workplace communications
   6. Resolving conflict in the workplace

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Technology will be an integral part of the course as students use word processing, e-mail, and the University's BLACKBOARD system to prepare documents and presentations. Students are required to use PowerPoint or another technological aide in at least one of their presentations. Peer reviews of documents, presentations, and responses to these reviews can be communicated online. The Business Proposal and the Analytical Report can be videotaped and recorded on appropriate media for inclusion in the student's cumulative learning portfolio.

## XII. Special Projects/Activities

None

## XIII. Textbooks and Teaching Aids

A. Required Textbooks

Dodd, Carley H., *Managing Business and Professional Communication*, Allyn & Bacon, 2011.

ISBN 0205823866
ISBN 978-0205823864

Lannon, John M., and Laura J. Gurak, *Technical Communication*, 14th Edition, Pearson, 2016.

B. Alternative Textbooks

Chall, Clarice. & Frendo, Evan, *New Ways in Teaching Business English*. TESOL International Education, 2014.

Pachter, Barbara, *The Essentials of Business Etiquette,* McGraw-Hill Education, 2013.

Emmerson, Paul & Hamilton, Nick, *Five-Minute Activities for Business English*. Cambridge Handbooks, 2005.

Duckworth, Michael G*., Oxford Business English: Business Grammar and Practice*, Oxford, 2003.

C. Supplemental Print Materials

None

D. Supplemental Online Materials

As provided by the publisher

**Course Title: UNIV 1211: Professional Development and Competencies**

**Semester Credit Hours:** 2 (2, 0)

## I. Course Overview

This course utilizes learning and time management skills provided in UNIV 1213, Leadership and Teamwork. Students apply these skills toward competencies related to the student's chosen field. The course introduces students to opportunities, required skills, challenges, and ethics of their chosen field, including prospective employers' expectations and licensure requirements (where applicable).

## I. PMU Competencies and Learning Outcomes

Students learn the skills required to succeed as a professional in their chosen area of study. These include discipline-specific forms of critical thinking skills, verbal and written communication, goal setting, planning and implementation in accordance with the standards of their discipline. Students refine their understanding their field, related professional expectations, and licensing and accrediting requirements.

## III. Detailed Course Description

The topics covered in this course include primary areas related to planning, communicating, implementing, and assessing professional, discipline-specific objectives and goals. These areas are highly interrelated and complementary. Together they provide the necessary framework for developing and implementing plans and goals in a professional setting. Focus is on continued development of emerging critical thinking and problem solving. Additionally, strategies are provided for helping the student pilot his or her way through the specific demands of the chosen major and to learn how to meet these demands during a professional career. This course is in the format of a two-credit lecture session, with distinct sections created to develop professional competencies in the various majors.

## IV. Requirements Fulfilled

This course is a required University Core course for all students during the first semester of the first year of undergraduate study. Note that specific sections are offered for each major.

## V. Required Prerequisites

There are no prerequisites for UNIV 1211

## VI. Learning Outcomes

Students will be able to:

- Describe the parameters of student's chosen profession, including specialized skills required to succeed as a professional.
- Know and Practice professional ethics related to their chosen profession.
- Identify and describe career paths available in their chosen field.
- Articulate personal strengths/weaknesses as they relate to their preferred professional field.
- Employ strategies for strengthening skills and countering weaknesses.
- Describe the pathway toward licensure, as applicable, in their chosen profession.
- Recognize the connection of university expectations to appropriate licensure.

## VII. Assessment Strategy

Student work will be evaluated by assignments, including verbal presentations, written reports, and participation in both classroom and extramural activities. Specific assignments include:

| | Assessment Task | Weight |
|---|---|---|
| 1 | **Assignment 1. Written Report 1 (Individual):** Students read career development models (including introductions to the theories by Holland, Bandura, Super).<br>Each student writes a short report indicating their understanding of the theoretical voices directing the career development journey and how their personal career journeys are impacted or may be shaped as a result. | 10% |
| 2 | **Assignment 2. Written Report 2. Professional Ethics and Etiquette Reflection. (Individual).**<br>Students receive lectures and read about ethics, etiquette, professionalism and write a short report on the various aspects of the topic, including definitions, its importance and role at the workplace and career growth.<br>**OR**<br>**Assignment 2 (Written Report 2) Conflict Management Report/ Presentation.** Understanding various aspects of the negotiation process. Students choose a conflict management and negotiation task/ topic. | 10% |
| 3 | **Assignment 3. Written Report 3 (Group): Interviewing and/or Shadowing Report**<br>In a selected company, student(s) interview and/or shadow a professional in their field and present their findings in the form of a written report and also orally in class. On the basis of the shadowing and/or interview done, the report should show opportunities, demands, and ethical understanding of the career as observed by the student or according the interviews responses of the professional(s) interviewed. This assignment gives the student the opportunity to experience, first-hand, what it take to be a successful professional in their chosen field. | 25% |
| 4 | **Assignment 3. Presentation of Written Report 3 (Group)**<br>Students present their report in class. The presentation, among other things, must demonstrate students' thorough understanding of their chosen career, including what typical work days looks like, the challenges and opportunities, and the ethics and etiquette associated with the profession, etc. | 15% |
| 5 | Midterm exam | 15% |
| 6 | Final exam | 15% |
| 7 | Listening and Participation | 10% |
| **Total** | | **100%** |

## VIII. Course Format

The course consists of a combination of presentations by the instructor, presentations by students, and field trips to appropriate professional sites.

Attendance at both staff and student presentations is mandatory. Lectures consist primarily of presentation and discussion of material outlined below. Occasional films are shown and Web-based presentations are made.

Web supplement: The course homepage (using suitable commercial Web tool) includes:

- Course syllabus
- Course assignments

- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours (2** hours per week**)** **Class:** 2
**Lab:** 0

## IX. Topics to Be Covered

The following list indicates general topics to be covered in this course. Each topic will be customized to reflect the process of developing professional competencies in engineering, business administration, information technology, or interior design.

Additional topics specific to any of these majors may be added by each section instructor:

A. Career development models (Introduction to Holland's theory and other professional development theories)
B. Steps in career planning
C. Marketing yourself
D. Networking, interviewing, informational interviewing, job shadowing
E. Ethics, etiquette, and professionalism
F. How to become professionally competent in the area of specialization
G. How to be successful in pursuing a specific college major
H. Critical thinking and problem solving related to a discipline
I. Setting discipline-specific professional goals and objectives
J. Objectively reviewing and appraising discipline-specific objectives
K. Developing action plans that lead to fulfillment of goals and objectives
L. Implementing discipline-specific strategies for achieving objectives
M. Understanding discipline-specific ethics and ethical issues
N. Developing a portfolio that highlights the student's competence and achievements
O. Developing key relationships with professionals, organizations, agencies and companies
P. Global Connectedness and Diversity at the workplace
Q. Managing conflicts in a culturally diverse workplace

## X. Laboratory Exercises

This course does not require a separate laboratory.

## XI. Technology Component

A. <u>In Class</u>

Faculty use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis.

B. <u>Outside of Class</u>

Faculty provide e-mail and/or Web site interaction regarding the course material, and post materials on a dedicated course Web site. Students are able to ask questions, observe, and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

## XII. Special Projects/Activities

This course consists of special projects, verbal and written presentations – that focus on development of relevant professional competencies. (See Section VIII Assessment Strategy.)

## XIII. Textbooks and Teaching Aids

A. Required Textbooks

- Corvette, B.A.Budjac, (2007) Conflict Management, A Practical Guide to Developing Strategies Pearson Education LTD, ISBN: 0131193236

B. Alternative Textbooks

None

C. Supplemental Print Materials

Other supplemental print materials as provided by faculty.

D. Supplemental Online Materials

As provided by the publisher.

**Course Title: UNIV 1212: Critical Thinking and Problem Solving**

**Semester Credit Hours:** 2 (2, 0)

## I. Course Overview

Critical Thinking and Problem Solving covers critical thinking and problem-solving methods, including deductive and inductive reasoning, fallacy, and causality. The students will analyze and present valid arguments. These arguments will put into practice student value systems and professional ethics.

## II. PMU Competencies and Learning Outcomes

Students of UNIV 1212 acquire and apply reasoning skills allowing them to critically analyze arguments and problems. Students learn to communicate solutions and reasoning to others. Group problem solving strengthens teamwork and leadership skills. They experience firsthand how ethical issues can affect problem solving across diverse cultures.

## III. Detailed Course Description

The course explores problem solving via simple logical puzzles and moves to an elementary study of argument. Critical thinking and reasoning are approached through a more advanced study of arguments dealing with values and ethics, reality, causality, induction, and deduction. The course concludes with discussions of faulty reasoning and fallacy.

The teaching methodology for the course provides student-centered learning through collaborative enquiry, developing both a student's individual skills and ability to work with others.

## IV. Requirements Fulfilled

The course is a required University Core course for all students during the second semester of the first year of undergraduate study.

## V. Required Prerequisites

There are no prerequisites for UNIV 1212.

## VI. Learning Outcomes

Students will be able to:

- Analyze arguments, assessing their strengths and weaknesses.
- Support conclusions based on valid arguments.
- Mitigate against weaknesses in their own arguments by
- Acknowledging contrary points.
- Demonstrate growth in teamwork and leadership skills.
- Use the Internet and other media resources, critically.
- Evaluate arguments, including evidence, reasoning, and fallacies, critically.
- Explain the role of language in critical thinking and argument formulation.

## VII. Assessment Strategy

| | Assessment Task | Weight |
|---|---|---|
| 1 | Assignment 1: Chapter analysis report and presentation assignment (Individual) | 15% |
| 2 | Assignment 2: Compare and contrast two argument assignment (group) | 15% |
| 3 | Assignment 3: Group debate assignment: The debate topic has global/international implications—demonstrating students' ability to understand global connectedness & interdependence(Group) | 15% |
| 4 | Assignment 4: Evaluate an advertisement assignment (Individual) | 15% |
| 6 | Listening/Participation/Attendance | 10% |
| 8 | Midterm exam | 15% |
| 7 | Final exam | 15% |
| **Total** | | **100%** |

## VIII. Course Format

In a seminar format, students will work in groups of two or three, reading and discussing pertinent material and information. At the beginning of each class, one student is designated as the discussion leader for the group and leads the discussion for that particular class. The discussion leaders will alternate so that each member of the group has equal opportunity. The faculty member enters into the group discussions only when asked, or when the group needs direction.

All work completed by the group is compiled into one notebook (loose leaf binder) for each group. Students are required to keep an individual "reflective notebook" in which, after each class, they will enter their own assessments of what was learned, and what questions they are left with from that particular seminar.

The faculty member keeps a daily journal in which he records observations about the progress of each group and the name and effectiveness of that day's group leader.

Faculty member lectures, when deemed necessary, to the entire class are held to an absolute minimum. The emphasis is on student participation.

Web supplement: The course home page on the University BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Links to related Web sites (See "Supplemental Online Materials.")
- Course calendar (an active utility)
- Course e-mail utility (an active utility)
- Course discussion list (optional, an active utility)
- Students' course grades (an active utility)

**Classroom Hours** (2 hours per week) **Class:** 2
**Lab:** 0

## IX. Topics to Be Covered

A. Introduction to problem solving
   1. Simple principles
   2. Organizing information
   3. Verifying the conclusion

B. Basic arguments
   1. General rules
   2. Arguments by example
   3. Arguments by analogy
   4. Arguments by authority
   5. Arguments about causes
   6. Deductive arguments

C. Critical thinking
   1. Foundations of arguments
   2. Values and ethics
   3. Reality assumptions
   4. Statistical and causal arguments
   5. Inductive generalizations
   6. Reasoning errors

D. Faulty reasoning
   1. Code of Intellectual Conduct
   2. Fallacy

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students will need access to the University's BLACKBOARD system. In the modern world it is imperative that students have as much opportunity as possible to actively interact with the Internet.

## XII. Special Projects/Activities

The groups are asked to perform a Web search using the key words "Critical Thinking and Problem Solving" and find an example which exhibits some principle they encountered in this course (Google: <http://www.google.com> is recommended for this). They are asked to compose, as a group, a brief report of how the principle is applied and include the report in their group notebook (The "Supplemental Online Materials" might be of use to them).

## XIII. Textbooks and Teaching Aids

A. Required Textbooks

1. Inch, Edward S. and Barbara Warnick, Critical Thinking and Communication, Pearson, 2013.
2. Diestler, Sherry, *Becoming a Critical Thinker: A User Friendly Manual,* 6th Edition, Pearson, 2012.
3. Damer, Edward, *Attacking Faulty Reasoning,* 7th Edition, Belmont, California: Wadsworth/ Thompson Learning, 2012.

B. Supplemental Print Materials
None

C. Supplemental Online Materials

As provided by the publisher.

**Course Title: UNIV 1213: Leadership and Teamwork**

**Semester Credit Hours:** 2 (2, 0)

## I. Course Overview

This interdisciplinary course introduces students to the characteristics of leadership. Students learn theoretical approaches to leadership and teamwork, including core concepts of contemporary leadership theory. Mastery of these concepts allows students to apply these concepts to their own life experiences.

## II. PMU Competencies and Learning Outcomes

Students employ critical thinking and analysis as they explore various leadership theories and their application. Course content will be applied throughout students' career at PMU. Students learn the role of initiative, planning and organizing, quality improvement, consulting, critical thinking, problem solving, and group facilitation in acting as a leader. Course exercises allow students to learn leadership and leadership strategies through doing. Students work in groups on projects and assignments, but students must also develop their own philosophy of leadership based upon what they have learned. Elements of this course prepares students for a later three-course capstone sequence.

## III. Detailed Course Description

Leadership and teamwork depend on willingness to act and to learn from experience. Exercising leadership and building successful teams requires information from a wide variety of disciplines. The course increases students' capacity to enhance their performance, potential, competence, and skills. Students learn that leadership involves inspiring and developing people toward shared goals. Success as a leader requires the disciplined integration of action and reflection. Leaders must use feedback to create change. The emphasis on leadership and teams in the course requires in-class interaction. Learning depends significantly on how much effort students put into this course outside of class.

## IV. Requirements Fulfilled

The course is a required University Core course for all students during the first semester of the second year of undergraduate study.

## V. Required Prerequisites

There are no prerequisites for UNIV 1213

## VI. Learning Outcomes

Students will be able to:

- Explain the role leadership plays in groups and organizations and its importance for conflict management.
- Evaluate various theoretical approaches to the study of leadership and teamwork.
- Articulate his or her own leadership style.
- Describe external influences upon their personal leadership style.
- Analyze the relationship between ethics and leadership.
- Demonstrate personal understanding of leadership traits required of leaders to appreciate diversity and conflict management in a globally connected world.

## VII. Assessment Strategy

A. Framework Exercises (30%)

Students will work in groups on five leadership and teamwork theoretical framework exercises. Students will then individually write a reflective paper of 300-500 words describing what they learned in the exercises. The projects are used to indicate a level of achievement of the selected learning outcomes.

B. Individual Leadership Reflection (Preliminary) (10%)

Early in the term each student will write a brief (500-750 words) definition of leadership, providing specific examples (present day or historical) of that definition.

C. Individual Leadership Reflection (Final) (20%)

Each student will write a reflective paper describing his or her own personal leadership philosophy and how that manifests itself in the student's life and work. Students should compare and contrast alternative models of leadership and explain what they have chosen to incorporate in their personal approach and why. The reflection paper should be between 1,000-1,500 words. Students will present orally as well as turn in a final written product.

D. Campus/Community Change/Improvement Suggestion Presentation (10%)

Students will be divided into groups based upon personal strengths demonstrated by Strengths Quest testing. Each group will be tasked with finding, researching, and proposing a particular area for positive change either on the campus or in the wider community. Students will present their proposal/ findings to a group of campus leaders.

E. Mid-term and Final Examinations (30%)

| | Assessment Task | Weight |
|---|---|---|
| 1 | Individual Leadership Reflection (Preliminary) | 10% |
| 2 | Framework Exercises | 30% |
| 3 | Individual Leadership Reflection (Final) | 20% |
| 4 | Campus/Community Change/Improvement Suggestion Presentation | 10% |
| 5 | Mid-term | 15% |
| 6 | Final | 15% |
| **Total** | | **100%** |

## VIII. Course Format

Students are expected to attend all classes, read the assigned material before class, and spend an average of two hours per week outside of class for every hour of lecture. These are minimum expectations. The class consists of lectures, group assignments and projects. Assignments alternate among lectures, group assignments and projects. They are due roughly every second or third week. All assignments and projects should be done as part of a group.

**Classroom Hours** (2 hours per week) **Class:** 2
**Lab:** 0

## IX. Topics to Be Covered

A. Defining leadership
B. History of leadership
C. Trait theories
D. Behavioral theories
E. Contingency theories
F. Power and influence theories
G. Transformational, cultural, and symbolic leadership theories
H. The new age of leadership
I. Social change leadership theory
J. Risk leadership theory
K. Ethics as leadership

L. Leadership equals change making
M. Defining teams
N. Communication in teams
O. Groups vs. teams
P. Conflict in teams
Q. Team development
R. Why teams fail - barriers to teams
S. Team member roles
T. Team learning
U. Project management
V. Effective meetings
W. Time management
X. Types of teams
Y. Problem solving and decision making

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have a computer account on the University BLACKBOARD system so that the class can communicate via e-mail. Students should immediately sign up for the online discussion group for the class. Students are also expected to become familiar with the use of the Internet.

All assignments and projects are submitted online. Assignments focus on guided collaborative learning, media-assisted instruction, research projects, and laboratory and computer exercises. Students should check with the instructor in order to obtain the specific methods to be used in the course.

## XII. Special Projects/Activities

None

## XIII. Textbooks and Teaching Aids

A. Required Textbooks

1. Johnson, David W. and Frank Johnson, *Joining Together – Group Theory and Group Skill*, 12th Edition, Pearson 2017.
2. Northhouse, Peter G., *Introduction to Leadership – Concepts and Practice*, 3rd Edition, Pearson 2015.

B. Supplemental Print Materials

1. Rees, Fran, *Teamwork from Start to Finish,* San Francisco, California: Jossey-Bass/Pfeiffer, 1997.
   ISBN 0787910619
2. StrengthsQuest* by Gallup, available from the following site:
   http://www.strengthsquest.com/home.

C. Supplemental Online Materials

As provided by the publisher.

**StrengthsQuest is a trademarked and thoroughly researched personality inventory that isolates individual personal strengths. Training in StrengthsQuest prepares individuals to understand what they do well, understand the strengths of others and maximize organizational effectiveness by employing personal and group strengths to projects.*

# D. COLLEGE CORE CURRICULUM

## Mathematics

MATH 1311:Finite Mathematics for Students of Business
MATH 1312: Calculus for Students of Business
MATH 1313: Statistical Methods
MATH 1422: Calculus I
MATH 1423: Calculus II
MATH 1324: Calculus III
MATH 2313: Probability and Statistics
MATH 2332: Linear Algebra
MATH 2332: Ordinary Differential Equations
MATH 3433: Differential Equations and Linear Algebra

**Course Title: MATH 1311: Finite Mathematics for Students of Business**

**Semester Credit Hours: 3 (3, 1)**

### I. Course Overview

Finite Mathematics for Students of Business covers topics from mathematics of finance that should be familiar to all students seeking careers in the business world. These include mathematics related to supply, demand and cost analysis; interest, annuity and investments; probability and decision making; and Markov processes. Students should acquire the necessary mathematical basis for further study in economics and finance. The prerequisite for MATH 1311 is the algebraic manipulation skill commensurate with that gained in the Preparation Year Program.

### II. PMU Competencies and Learning Outcomes

Students of MATH 1311 will begin to understand the quantitative tools that contribute to the professional competence needed to make rational business decisions about the future, as well as to find practical solutions to problems in the present. The students will begin to learn how to use these tools to communicate their ideas and solutions to others. Students will be introduced to the use of "real-world" data obtained from sources such as the Internet. Students will become adept at using the Web-based course supplement to access course materials and communicate with fellow classmates and the instructor. They enhance their teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

### III. Detailed Course Description

The course begins with a discussion of functions modeling concepts related to cost (fixed and variable), revenue, profit, and supply and demand. The course then proceeds to topics involving interest, future, and present values of an annuity. This includes sinking funds and amortization. The course next covers topics from discrete probability and counting, considering odds and expected value of a random variable. It concludes with a discussion of Markov Chains and their use in making long-term projections. In all cases the emphasis of the course should be on concepts and applications to business and finance. Emphasis on memorization of formula and algorithms should be minimal.

### IV. Requirements Fulfilled

MATH 1311 satisfies three hours of the College Core mathematics requirements. It is the prerequisite for MATH 1312, Calculus for Students of Business, and is required of all students pursuing degrees from the College of Business Administration. MATH 1311 should be taken the first semester after

completion of the Preparation Year Program.

## V. Required Prerequisites

PRPM 0012: Intermediate Algebra.

## VI. Learning Outcomes

- To learn basic tools from finite mathematics that can be applied to business related endeavors.
- To begin to learn how to use tools from mathematics to make good business decisions.
- To begin to develop an understanding of how long-term investments produce profits.
- To learn how one can make long-term predictions with respect to market share and demographics.
- To develop improved collaborative skills.

## VII. Assessment Strategy

For purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of the mathematics to business and finance.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and receive credit accordingly.
- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII. Course Format

Primary instruction is to be in a lecture format with the course meeting three times per week for one hour each meeting. At least once per week the students should be allowed to work for at least 30 minutes in class, in groups of two or three, on an application problem chosen from the text by the instructor.

Web supplement. Course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail utility (an active utility)
- Course discussion list (an active utility)
- Student course grades (an active utility)

**Classroom Hours** (4 hours per week) **Class:** 3
**Recitation:** 1

## IX. Topics to be Covered

A. Modeling with elementary functions
   1. Piece-wise linear functions
   2. Cost function - fixed cost + variable cost
   3. Revenue
   4. Profit - revenue-cost
   5. Linear functions representing price-supply and price-demand equilibrium
   6. Quadratic functions representing revenue and profit breakeven analysis
   7. Average cost
   8. Compound interest
   9. Use of Ln to solve for value of the exponent in compound interest formula

B. Math of finance
   1. Simple and compound interest
   2. Future value
   3. Present value
   4. Doubling time
   5. Periodic investments
   6. Sinking funds

C. Probability
   1. Discrete probability and counting
   2. Bayes' Formula
   3. Odds
   4. Expected value of random variable
   5. Empirical Probability

D. Markov Chains
   1. Transition diagram
   2. Transition matrix
   3. Long-term projection
   4. Absorbing chain

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

All calculations involving real-world data and matrices will be done using the appropriate technology, calculator or computer program.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on "real-world" applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Barnett/Ziegler/Byleen, *Finite Mathematics for Business, Economics, Life Sciences and Social Sciences,* 13th Edition, Pearson, 2015.
ISBN10: 1-292-06229-0

B. Alternative Textbooks

Student supplements as provided by the publisher.

C. Supplemental Print Materials

Materials provided by the publisher.

D. Supplemental Online Materials

Online materials supplied by the publisher.

**Course Title: MATH 1312: Calculus for Students of Business**

**Semester Credit Hours: 3 (3, 1)**

## I. Course Overview

Calculus for Students of Business covers topics from calculus that should be particularly useful for students studying economics and finance. Such topics include regression analysis, mathematical modeling, rate of change, and marginal analysis from differential calculus. Topics covered from integral calculus include optimization and area calculations as they apply to average value, value of continuous income flows, coefficients of inequity, and consumer and producer surplus. Students should acquire the necessary mathematical knowledge and skills for further study in economics and finance.

## II. PMU Competencies and Learning Outcomes

Students of MATH 1312 will continue to develop the quantitative skills needed to be successful in subsequent courses in business and finance and to make rational business decisions about the future, as well as find practical solutions to problems in the present. The students will continue to learn how to use these tools to communicate their ideas and solutions to others. And the students will continue to experience the use of "real-world" data obtained from sources like the Internet. Students will become adept at using the Web-based course supplement to access course materials and communicate with fellow classmates and the instructor. They will enhance their teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

## III. Detailed Course Description

The course begins with a discussion of regression analysis to model real-world phenomena. It proceeds to apply the concept of rate of change to study marginal analysis, elasticity of demand, and management of resources. The course concludes by using integral calculus to study areas as applied to such topics as average value, continuous income flow, coefficient of inequity, and consumer surplus and producer surplus. In all cases the emphasis of the course should be on concepts and applications to business and finance. Emphasis on memorization of formula and algorithms should be minimal.

## IV. Requirements Fulfilled

MATH 1312 satisfies three hours of the College Core mathematics requirements. It is required of all students pursuing degrees from the College of Business Administration. The course should be taken immediately after the student completes MATH 1311.

## V. Required Prerequisites

MATH 1311: Finite Mathematics for Students of Business.

## VI. Learning Outcomes

- To learn basic tools from calculus that can be of use in subsequent courses in business and finance.

- To learn to solve problems using the tools of calculus.
- To learn to communicate the solutions of technical problems to others.
- To develop improved collaborative skills.

## VII. Assessment Strategy

For purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of the mathematics to business and finance.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and receive credit accordingly.
- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII. Course Format

Instruction: Primary instruction is to be in a lecture format with the course meeting three times per week for one hour each meeting. At least once per week the students should be allowed to work for at least 30 minutes in class, in groups of two or three, on an application problem chosen from the text by the instructor.

Web supplement: Course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail utility (an active utility)
- Course discussion list (an active utility)
- Student course grades (an active utility)

**Classroom Hours** (4 hours per week) **Class:** 3

**Recitation:** 1

## IX. Topics to be Covered

A. Chapter 10: Limits and the derivative
   1. Introduction to limits
   2. Infinite limits and limits at infinity
   3. Continuity
   4. The derivative
   5. Basic differentiation properties
   6. Differentials
   7. Marginal analysis in business and economics

B. Chapter 11: Additional derivative topics
   1. The constant e and continuous compound interest
   2. Derivatives of logarithmic and exponential functions
   3. Derivatives of products and quotients
   4. The chain rule
   5. Implicit differentiation
   6. Related rates
   7. Elasticity of demand

C. Chapter 12: Graphing and optimization
   1. First derivative and graphs
   2. Second derivative and graphs
   3. L'Hopitals's Rule
   4. Curve sketching techniques
   5. Absolute maxima and minima
   6. Optimization

D. Chapter 13: Integration
   1. Antiderivatives and indefinite integrals
   2. Integration by substitution
   3. Differential equations; growth and decay
   4. The definite integral
   5. The fundamental theorem of calculus

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

Calculator or computer program capable of performing regression analysis using real-world data.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on "real-world" applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Hoffmann and Bradley, *Calculus for Business, Economics, and the Social and Life Sciences*, 11th edition, by, ISBN 0-07-122024-8

B. Alternative Textbooks

Barnett/Ziegler/Byleen, *Finite Mathematics for Business, Economics, Life Sciences and Social Sciences,* 13th Edition, Pearson, 2015.
ISBN10: 1-292-06229-0

C. Supplemental Print Materials

Materials provided by the publisher.

D. Supplemental Online Materials

Materials provided by the publisher.

**Course Title: MATH 1313: Statistical Methods**

**Semester Credit Hours: 3 (3, 1)**

## I. Course Overview

Statistical Methods covers statistical models and methods of analyzing data. These include estimation, tests of significance, analysis of variance, linear regression, and correlation. Students will acquire the necessary statistical basis for using available information to make rational decisions. The prerequisite for MATH 1313 is the algebraic manipulation skill commensurate with that gained in the Preparation Year Program.

## II. PMU Competencies and Learning Outcomes

Students of MATH 1313 will gain the statistical knowledge of data collection and analysis needed to make rational business decisions. The students will begin to learn how to use these tools to communicate their ideas and solutions to other. And the students will be introduced to data obtained from sources available on the Internet and learn how to use professional software to analyze such data. They will enhance their teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

## III. Detailed Course Description

The course begins with a discussion of data needs, types, sources, presentation, and analysis. Such analysis includes measures of central tendency, variation, and coefficient of correlation. Basis probability and probability distributions are discussed. These include covariance, and binomial and normal distribution. The course concludes with sampling distribution and confidence intervals, hypothesis testing, regression analysis, and control charts. Emphasis is on the use of statistics to decision making in the managerial context. Emphasis on memorization of formula and algorithms should be minimal.

## IV. Requirements Fulfilled

MATH 1313 satisfies three hours of the College Core mathematics requirements. MATH 1313 is a recommended elective for all students and required of all students entering the College of Business Administration or the Interior Design program in the College of Engineering.

## V. Required Prerequisites

PRPM 0012: Intermediate Algebra.

## VI. Learning Outcomes

- To learn to use statistical analysis in decision making.
- To develop an understanding of the appropriate and inappropriate use of statistical data to make inferences.
- To learn how to use professional software in statistical analysis.

## VII. Assessment Strategy

For purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of the mathematics to business and finance.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and receive credit accordingly.

- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII. Course Format

Instruction: Primary instruction is to be in a lecture format with the course meeting three times per week for one hour each meeting. At least once per week the students should be allowed to work for at least 30 minutes in class, in groups of two or three, on an application problem chosen from the text by the instructor.

Web supplement: The course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail utility (an active utility)
- Course discussion list (an active utility)
- Student course grades (an active utility)

**Classroom Hours** (4 hours per week) **Class:** 3
**Recitation:** 1

## IX. Topics to be Covered

A. Introduction to data analysis
   1. Need for data
   2. Types of data
   3. Sources of data
   4. Design of survey research
   5. Types of sampling methods
   6. Evaluating survey worthiness

B. Presenting data
   1. Tables and charts for numerical data
   2. Bivariate data
   3. Tables and carts for categorical data
   4. Bivariate categorical data

C. Numerical descriptive data
   1. Measure of central tendency
   2. Variation
   3. Descriptive summary statistics
   4. Coefficient of correlation
   5. Pitfalls and ethical issues

D. Basic probability

1. Basis probability
2. Conditional probability
3. Ethical issues

E. Probability distributions
1. Discrete random variable
2. Covariance and application to finance
3. Binomial distribution
4. Normal distribution

F. Sampling distribution and confidence intervals
1. Confidence intervals
2. Estimation of the mean
3. Estimation of proportion
4. Sampling size
5. Ethical issues

G. Hypothesis testing
1. Z test
2. t test
3. Proportions
4. Pitfalls and ethical issues
5. Inference for comparing two means
6. Inference for comparing two proportions

H. Simple linear regression
1. Models
2. Variation
3. Residual analysis

I. Multiple regression
Developing a model

J. Applications of quality and productivity
Control charts

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

A. Microsoft Excel 5.0 or higher with the Phstat2 add-on (furnished with text). The students will gain experience with this professional software as they use it to complete the exercises in the text.

B. BLACKBOARD, see "Course Format." In the modern world, it is imperative have as much opportunity as possible to actively interact with the Internet.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on "real-world" applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

McClave, J.T. and Sinich, T, S*tatistics: Pearson New International Edition,.*., 13th Edition, ISBN 978-1292-16155-6.

B. Alternative Textbooks

Levine, David, Timothy Krehbiel, and Mark Berenson, *Business Statistics: A First Course,* 5th Edition, Pearson, 2010.
ISBN: 0-13-606065805

C. Supplemental Print Materials

As available from publisher.

D. Supplemental Online Materials

As available from publisher.

**Course Title: MATH 1422 Calculus I**

**Semester Credit Hours: 4 (4, 1)**

## I. Course Overview

Calculus I covers topics from differential calculus with an introduction to integration. Topics include limits of functions, concept of differentiation of one variable with rules for differentiation, and applications of derivatives involving related rates, optimization, and curve sketching. Integration is introduced and the Fundamental Theorem of Calculus is covered. Students should acquire the necessary mathematical knowledge and skills for further study in calculus and engineering. The prerequisite for MATH 1422 is PRPM 0022: Pre-Calculus, or knowledge and skills therein. The course will be taught in the lecture format, one hour per class, three hours per week, with an additional one-hour problem-solving recitation.

## II. PMU Competencies and Learning Outcomes

Students of MATH 1422 will continue to develop the quantitative skills needed to be successful in subsequent courses in calculus and ultimately in their courses in engineering. These skills will enhance their ability to analyze and solve problems in a technical context and communicate their solutions to other professionals using the language of mathematics. Students will become adept at using the Web-based course supplement to access course materials and communicate with fellow classmates and the instructor. They will enhance their teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

## III. Detailed Course Description

MATH 1422 is a mainstream course in Differential Calculus. It covers both the mechanics of computing derivatives and their applications to problems arising in the physical sciences and engineering. Such topics include limits of functions, concept of differentiation of one variable with rules for differentiation, and applications of derivatives involving related rates, optimization, and curve sketching. In addition, the indefinite and definite integral are introduced. In all cases the emphasis of the course is on concepts and applications to physical science and engineering. Emphasis on memorization of formula and algorithms should be minimal.

## IV. Requirements Fulfilled

MATH 1422 satisfies four hours of the College Core mathematics requirements. It is required of all students pursuing degrees from the College of Engineering (except Interior Design). It should be taken as soon as possible after the preparation year.

## V. Required Prerequisites

PRPM 0022: Pre-Calculus.

## VI. Learning Outcomes

- Learn to compute and apply derivatives.
- To develop an understanding of how differentiation is used to solve problems arising in the physical sciences and engineering.
- To learn to compute simple integrals.
- To learn to approximate definite integrals numerically.
- To learn to solve problems using the tools of calculus.
- To learn to communicate the solutions of technical problems to other.
- To develop improved collaborative skills.

## VII. Assessment Strategy

For the purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of Calculus to physical science and engineering.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and receive credit accordingly.
- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII. Course Format

Instruction: Primary instruction is in a lecture plus recitation format with the course meeting three times per week for a one-hour lecture, plus once a week for a one-hour problem-solving recitation. During the recitation, students should work in groups of two or three on application problems chosen from the text by the instructor.

Web supplement: Course home page on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail utility (an active utility)
- Course discussion list (an active utility)
- Student course grades (an active utility)

**Classroom Hours** (5 hours per week) **Class:** 4
**Recitation:** 1

## IX. Topics to be Covered

A. Functions, graphs, and models (review)
   1. Functions and mathematical modeling
   2. Graphs of equations and functions

3. Polynomials and algebraic functions
4. Transcendental functions

B. Prelude to calculus
1. Tangent lines and slope predictors
   Investigation: Numerical slope
2. The limit concept
   Investigation: Limits, slopes, and logarithms
3. More about limits
   Investigation: Numerical epsilon-delta limits
4. The concept of continuity

C. The derivative
1. The derivative and rates of change
2. Basic differentiation rules
3. The chain rule
4. Derivatives of algebraic functions
5. Maxima and minima of functions on closed intervals
   Investigation: When is your coffee cup stablest?
6. Applied optimization problems
7. Derivatives of trigonometric functions
8. Exponential and logarithmic functions
   Investigation: Discovering the number *e* for yourself
9. Implicit differentiation and related rates

D. Additional applications of the derivative
1. Increments, differentials, and linear approximation
2. Increasing and decreasing functions
3. The first derivative test and applications
   Investigation: Constructing a candy box with lid
4. Simple curve sketching
5. Higher derivatives and concavity
6. Curve sketching and asymptotes
   Investigation: Locating special points on exotic graphs
7. Indeterminate forms and L'Hopital's Rule
8. More indeterminate forms

E. The integral
1. Antiderivatives and initial value problems
2. Elementary area computations
3. Riemann Sums and the integral
   Investigation: Calculator/computer Riemann Sums
4. Evaluation of integrals
5. The fundamental theorem of calculus
6. Integration by substitution
7. Areas of plane regions

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

Graphing calculator and Computer Algebra system (MAPLE recommended). Students should be given minimal instruction in the use of these technologies and urged to use them to compare graphs of functions and their first and second derivatives.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on "real-world" applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

James Stewart, *Calculus, Early Transcendentals,* 8th edition, CENGAGE Learning 2016. Library of

Congress Control Number: 2014951195,
ISBN: 978 – 1 – 305 – 27237 – 8

B. Alternative Textbooks

Edwards, C. Henry, and David E. Penney, *Calculus, Early Transcendentals*, 7th Edition, Pearson, 2008.
ISBN-10:0131569899

C. Supplemental Print Materials

As provided by the publisher

D. Supplemental Online Materials

As provide by the publisher

**Course Title: MATH 1423 Calculus II**

**Semester Credit Hours: 4 (4,1)**

## I. Course Overview

Calculus II is the continuation of MATH 1422: Calculus I. It covers topics from integral calculus of one variable, infinite sequences and series, and vectors. Students continue to acquire the necessary mathematical knowledge and skills for further study in calculus and engineering. The prerequisite for MATH 1423 is MATH 1422. The course will be taught in the lecture format, one hour per class, three hours per week, with an additional one-hour problem-solving recitation.

## II. PMU Competencies and Learning Outcomes

Students of MATH 1423 will continue to develop the quantitative skills needed to be successful in subsequent courses in calculus and ultimately in their courses in engineering. These skills will enhance their ability to analyze and solve problems in a technical context and communicate their solutions to other professionals using the language of mathematics. Students will become adept at using the Web-based course supplement to access course materials and communicate with fellow classmates and the instructor. They will enhance their teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

## III. Detailed Course Description

MATH 1423 is the continuation of MATH 1422. It covers both the mechanics of computing integrals and their applications to problems arising in the physical sciences and engineering. Such topics include applications of integration to the computation of areas, volumes, and arc length; as well as work and force. Techniques of integration are also covered. Sequences and comparison tests for series are covered along with power series. In all cases the emphasis of the course should be on concepts and applications to physical science and engineering. Emphasis on memorization of formula and algorithms should be minimal.

## IV. Requirements Fulfilled

MATH 1423 satisfies 4 hours of the College Core mathematics requirements. It is required of all students pursuing degrees from the College of Engineering (except Interior Design). It should be taken immediately after completion of MATH 1422: Calculus I.

## V. Required Prerequisites

MATH 1422: Calculus I

## VI. Learning Outcomes

- To learn to compute and apply definite and indefinite integrals.
- To develop an understanding of how integration is used to solve problems arising in the physical sciences and engineering.
- To learn to compute complicated integrals.
- To learn to determine limits of simple sequences and series.
- To learn how to work with vectors in 2-space and 3-space.
- To learn to solve problems using the tools of mathematical modeling.
- To learn to communicate the solutions of technical problems to other.
- To develop improved collaborative skills.

## VII. Assessment Strategy

For the purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of Calculus to physical science and engineering.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and receive credit accordingly.
- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII. Course Format

Instruction: Primary instruction is in a lecture plus recitation format with the course meeting three times per week for a one-hour lecture, plus once a week for a one-hour problem-solving recitation. During the recitation, students should work in groups of two or three on application problems chosen from the text by the instructor.

Web supplement: Course home page on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail utility (an active utility)
- Course discussion list (an active utility)
- Students course grades (an active utility)

**Classroom Hours** (5 hours per week) **Class:** 4
**Recitation:** 1

## IX. Topics to be Covered

A. Integration (review)
   1. Integration by substitution
   2. Areas of plane regions
   3. Numerical integration

B. Applications of the integral
   1. Rieman Sum approximations
   2. Volumes by the Method of Cross Sections
   3. Volumes by the Method of Cylindrical Shells
      Investigation: Design your own ring
   4. Arc length
   5. Force and work

C. Methods of integration
   1. Integral tables and simple substitutions
   2. Integration by parts
   3. Trigonometric integrals
   4. Rational functions and partial fractions
   5. Trigonometric substitutions
   6. Integrals involving quadratic polynomials
   7. Improper integrals

D. Infinite series
   1. Infinite sequences
      Investigation: Nested radicals and continued fractions
   2. Infinite series and convergence
      Investigation: Numerical summation and geometric series
   3. Taylor Series and Taylor Polynomials
      Investigation: Calculating logarithms on a deserted island
   4. The integral test
      Investigation: The number *p*, once and for all
   5. Comparison tests for positive-term series
   6. Alternating series and absolute convergence
   7. Power series
   8. Power series computations
   9. Series solutions of differential equations

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

Graphing calculator and Computer Algebra system (MAPLE recommended). Students should be given minimal instruction in the use of these technologies and urged to use them to compare graphs of functions and their first and second derivatives.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on “real-world” applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

James Stewart, *Calculus, Early Transcendentals,* 8th edition, CENGAGE Learning 2016. Library of Congress Control Number: 2014951195,
ISBN: 978 – 1 – 305 – 27237 – 8

B. Alternative Textbooks

Edwards, C. Henry, and David E. Penney, *Calculus, Early Transcendentals*, 7th Edition, Pearson, 2008.
ISBN-10:0131569899

C. Supplemental Print Materials

As available from publisher

D. Supplemental Online Materials

As available from publisher

**Course Title: MATH 1324 Calculus III**

**Semester Credit Hours: 3 (3, 1)**

## I. Course Overview

Calculus III is the continuation of MATH 1423: Calculus II and the final course in the pre-engineering calculus sequence. It covers topics from multivariable calculus including vector-valued functions, multiple integration, and vector analysis. Students complete their acquisition of the necessary mathematical knowledge and skills for further study in engineering. The prerequisite for MATH 1324 is MATH 1423.

## II. PMU Competencies and Learning Outcomes

Students of MATH 1324 will develop the quantitative skills needed to be successful in subsequent courses in engineering. These skills will enhance their ability to analyze and solve problems in engineering and communicate their solutions to other engineering professionals using the language of mathematics. Students will become adept at using the Web-based course supplement to access course materials and communicate with fellow classmates and the instructor. They will enhance their teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

## III. Detailed Course Description

MATH 1324 is the continuation of MATH 1423 and the culmination of the three-course calculus series. It covers topics from multivariable calculus including vector-valued functions, multiple integration, and vector analysis. Differentiation and integration of vector-valued functions are studied with application of ballistics. Techniques and applications of partial differentiation are covered as well as multiple integration with application to surface areas, mass, and moments. The course ends with a discussion of the multiple variable versions of the Fundamental Theorem of Calculus: Greens Theorem and Stokes Theorem. In all cases the emphasis of the course should be on concepts and applications to physical science and engineering. Emphasis on memorization of formula and algorithms should be minimal.

## IV. Requirements Fulfilled

MATH 1324 satisfies three hours of the College Core mathematics requirements. It is required of all students pursuing degrees from the College of Engineering (except Interior Design). It should be taken immediately after completion of MATH 1423.

## V. Required Prerequisites

MATH 1423: Calculus II

## VI. Learning Outcomes

- To develop understanding of modeling in three dimensions.
- To learn to compute and apply partial derivatives.
- To develop an understanding of how partial differentiation and multiple integration is used to solve problems arising in the physical sciences and engineering.
- To learn to communicate the solutions of technical problems to other.
- To develop improved collaborative skills.

## VII. Assessment Strategy

For the purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of Calculus to physical science and engineering.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and receive credit accordingly.
- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII. Course Format

Instruction: Primary instruction is to be in a lecture format with the course meeting three times per week for one hour each meeting. At least once per week the students should be allowed to work for at least 30 minutes in class, in groups of two or three, on an application problem chosen from the text by the instructor.

Web supplement. Course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail utility (an active utility)
- Course discussion list (an active utility)
- Student course grades (an active utility)

**Classroom Hours** (4 hours per week) **Class:** 3
**Recitation:** 1

## IX. Topics to be Covered

A. Vectors, curves, and surfaces in space
   1. Lines and planes in space
   2. Curves and motion in space
      Investigation: Does a pitched baseball really curve?

3. Curvature and acceleration
4. Cylinders and quadratic surfaces
5. Cylindrical and spherical coordinates

B. Partial differentiation
1. Introduction
2. Functions of several variables
3. Limits and continuity
4. Partial derivatives
5. Multivariable optimization problems
6. Increments and linear Approximation
7. The Multivariable chain rule
8. Directional derivatives and the gradient vector

C. Multiple integrals
1. Double integrals
   Investigation: Midpoint sums approximating double integrals
2. Double integrals over more general regions
3. Area and volume by double integration
4. Double integrals in polar coordinates
5. Triple integrals
6. Integration in cylindrical and spherical coordinates
7. Surface area
8. Change of variables in multiple integrals

D. Vector calculus
1. Vector fields
2. Line integrals
3. The fundamental theorem and independence of path
4. Green's Theorem
5. Surface integrals
   Investigation: Surface integrals and rocket nose cones
6. The Divergence Theorem
7. Stokes' Theorem

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

Graphing calculator and Computer Algebra system (MAPLE recommended). Students should be given minimal instruction in the use of these technologies and urged to use the technology to draw lots of three-dimensional graphs.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on "real-world" applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

James Stewart, *Calculus, Early Transcendentals,* 8th edition, CENGAGE Learning 2016. Library of Congress Control Number: 2014951195,
ISBN: 978 – 1 – 305 – 27237 – 8

B. Alternative Textbooks
Edwards, C. Henry, and David E. Penney, *Calculus, Early Transcendentals*, 7th Edition, Pearson, 2008.
ISBN-10:0131569899

C. Supplemental Print Materials

As available from publisher.

D. Supplemental Online Materials

As available from publisher.

**Course Title: MATH 2313: Probability and Statistics**

**Semester Credit Hours: 3 (3, 1)**

## I. Course Overview

This course provides a foundation to probability and statistics with applications required for certain majors in the College of Computer Engineering and Science and the College of Engineering. Topics include: basic combinatorics, random variables, probability distributions, Bayesian influence, hypothesis testing, confidence intervals, and linear regression.

## II PMU Competencies

Students will develop knowledge and cognitive skills through an understanding of basic concepts in probability and be able to solve problems arising in computer science and engineering that involve probability and statistical concepts. Students will use class and lab team exercises to communicate their findings with each other and with the instructor orally and in writing. Team exercises in solving problems will also reinforce development of global connections with other cultures and practice in conflict management.

## III Detailed Course Description

This course begins with foundations of probability, including; sample spaces, probability distributions, and discrete and continuous random variables. Basic Statistics are computed such as the mean, variance, covariance, and correlation coefficient. Also, the study of joint distributions and independence is introduced. Limit Theorems such as the law of large numbers and the central limit theorem (CLT) are then discussed. Regression analysis is also visited, such as linear models and least squares estimation. The course concludes with hypothesis testing, null hypothesis, test statistics, type I and II errors, t-tests, computational methods, simulation, and bootstrapping.

## IV Requirements Filled

- In the College of Computer Engineering and Science MATH 2313 is a required course for students majoring in Computer Science, Computer Engineering, and Software Engineering.
- In the College of Engineering and Science, MATH 2313 is a required course for students majoring in Civil Engineering.

## V Required Prerequisites

MATH 1422: Calculus I

## VI Course Learning Outcomes

After successfully completing the course, students will be able to:

- Understand basic concepts in probability including combinatorics, independence, conditional probability and Bayes' rule.
- Solve basic problems that involve discrete and continuous probability distributions.
- Use statistical concepts such as means, variances, and various types of graphs to analyse datasets using computational software.
- Understand confidence intervals and perform statistical inference such as hypothesis testing and regression.

## VII Assessment Strategy

For purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of the mathematics to computer science.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work

and receive credit accordingly.
- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII Course Format

Students will meet three hours each week for lecture/class activities and one hour each week in lab. Lecture classes will consist of both lecture and informal team activities. Lab exercises will reinforce topics covered in class and allow time for a formal team project.

**Classroom Hours** (4 hours per week) Class: 3
Recitation: 1

## IX Topics to be covered

A. Foundations of probability

1. Outcomes, events, and probability
2. Conditional probability and independence
3. Discrete random variables
4. Continuous random variables

B. Basic Statistics

1. Expectation and variance
2. Joint distributions and independence
3. Covariance and correlation

C. Limit theorems

1. The law of large numbers
2. The central limit theorem

D. Regression

1. Basic statistical models
2. The method of least squares

E. Hypothesis testing

1. Confidence intervals for the mean
2. More on confidence intervals
3. Testing hypotheses
4. The t-test

F. Computational methods

1. Simulation
2. The bootstrap

G. Review

1. Understanding concepts, definitions, and results

**X Laboratory Exercises**

This course does not require a separate lab other than the recitation section.

**XI. Technology Component**

This course has no technology component other than use of students' personal laptop computers as appropriate.

**XII. Special Projects/Activities**

Special projects and activities can include team presentations which focus on "real-world" applications.

**XIII Textbook(s) and/or other Required Material**

**Dekking,** F.M., et al, *A Modern Introduction to Probability and Statistics. Understanding Why and How?* (L.E. Series: Springer Texts in Statistics), Springer, 2007.
ISBN-10: 1852338962
ISBN-13: 978-185233896

**Course Title: MATH 2331: Linear Algebra**

**Semester Credit Hours: 3 (3, 1)**

**I. Course Overview**

Linear Algebra covers topics from linear algebra including vector spaces, linear transformations and matrices, matrix operations, and eigenvectors and eigenvalues. Students acquire mathematical knowledge and skills with matrices, linear systems, and vector spaces necessary for further study in engineering. The prerequisite for MATH 2331 is MATH 1324, Calculus III, or concurrent enrollment therein. The course will be taught in the lecture format, one hour per class, three classes per week.

**II. PMU Competencies and Learning Outcomes**

Students of MATH 2331 will develop the quantitative skills with matrices and linear systems needed to be successful in subsequent courses in engineering. These skills will enhance their ability to analyze and solve and communicate their solutions to fellow professionals using the language of mathematics. Students will continue to use the Web-based course supplement to access course materials and communicate with classmates and the instructor. They will enhance teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

**III. Detailed Course Description**

MATH 2331 covers topics of matrix algebra and linear spaces. Matrix topics include systems of linear equations, row echelon form, matrix algebra, elementary matrices, determinants, and Cramer's Rule. Vector space topics include subspaces, linear dependence and independence, basis and dimension, row and column spaces. Linear transformations are discussed in detail including matrix representations and similarity. The course concludes with a discussion of orthogonality and eigenvalues and eigenvectors. The major emphasis is on applications to problems from the physical sciences and engineering.

**IV. Requirements Fulfilled**

MATH 2331 satisfies three hours of the College Core mathematics requirements. It is required of all students pursuing degrees from the College of Engineering (except Interior Design). It should be taken immediately after completion of, or concurrent with, MATH 1324.

## V. Required Prerequisites

Completion of, or concurrent enrollment in, MATH 1324: Calculus III

## VI. Learning Outcomes

- To develop understanding of vector spaces in three and higher dimensions.
- Learn to use and manipulate matrices.
- To develop an understanding of how matrix algebra and vector space concepts are used to solve problems arising in the physical sciences and engineering.
- To learn to communicate the solutions of technical problems to other.
- To develop improved collaborative skills.

## VII. Assessment Strategy

For the purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of linear algebra to physical science and engineering.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and receive credit accordingly.
- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII. Course Format

Instruction: Primary instruction is a lecture format, with the course meeting three times per week for one hour each meeting. At least once per week, the students should be allowed to work in class for at least 30 minutes in groups of two or three on an application problem chosen from the text by the instructor.

Web supplement: Course home page on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail (an active utility)
- Course discussion list (an active utility)
- Student course grades (an active utility)

**Classroom Hours** (4 hours per week) **Class:** 3

**Recitation:** 1

## IX. Topics to be Covered

A. Matrices and linear systems
   1. Systems of linear equations
   2. Row echelon form
   3. Matrix algebra
   4. Elementary matrices

B. Determinants
   1. Properties of determinants
   2. Cramer's Rule (briefly)

C. Vector spaces
   1. Examples
   2. Subspaces
   3. Linear independence
   4. Basis and dimension
   5. Change of basis
   6. Row and column space

D. Linear transformations
   1. Examples
   2. Matrix representations
   3. Similarity

E. Orthogonality
   1. Scalar product
   2. Orthogonal Subspaces
   3. Least squares problems

F. Eigenvalues
   1. Eigenvalues and eigenvectors
   2. Systems of linear differential equations
   3. Diagonalization

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

This course has no technology component other than use of students' personal laptop computers as appropriate.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on "real-world" applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Leon, Steven, *Linear Algebra with Applications*, 8th Edition, Pearson, 2010.
ISBN-10: 0136009298

B. Alternative Textbooks

None

C. Supplemental Print Materials

As available from publisher.

D. Supplemental Online Materials

As available from publisher.

**Course Title: MATH 2332 Ordinary Differential Equations**

**Semester Credit Hours: 3 (3, 1)**

## I. Course Overview

Ordinary Differential Equations covers topics involving single variable differential equations. These include methods for solving first and second order differential equations, Laplace Transforms, and Fourier Series and Transforms. Students acquire mathematical knowledge and skills to model and solve problems arising from engineering. The prerequisite for MATH 2332 is MATH 2331: Linear Algebra. The course will be taught in the lecture format, one hour per class, three classes per week.

## II. PMU Competencies and Learning Outcomes

Students of MATH 2332 will develop the skills needed to model problems arising in the physical sciences and engineering. These skills will enhance their ability to analyze and solve problems in engineering and communicate their solutions to fellow professionals using the language of mathematics. Students will continue to use the Web-based course supplement to access course materials and communicate with classmates and the instructor. They will enhance teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

## III. Detailed Course Description

MATH 2332 develops the basic methods for solving first order differential equations. These include separation of variables, exact differential equations, and integrating factors. Problems arising from the physical science and engineering involving such equations are modeled and solved. Higher order linear differential equations, both homogeneous and non-homogeneous, are discussed using the methods of undetermined coefficients and variation of parameters. Laplace Transforms are covered in some detail including transformations of derivatives and integrals, unit step functions, and Dirac's Delta function. Differentiation and integration of transforms are covered along with convolution and integral equations. These are applied to solutions of differential equations and systems of differential equations. MATH 2332 concludes with a brief discussion of Fourier Series approximations to periodic, even, and odd functions. The major emphasis is on modeling and solving problems arising in the physical sciences and engineering.

## IV. Requirements Fulfilled

MATH 2332 satisfies three hours of the College Core mathematics requirements. It is required of all students pursuing degrees from the College of Engineering (except Interior Design). It should be taken immediately after completion of MATH 2331: Linear Algebra.

## V. Required Prerequisites

MATH 1324: Calculus III

## VI. Learning Outcomes

- To develop skills in modeling problems arising from the physical sciences and engineering.
- To learn to use the basic methods from differential equations to solve problems arising from the physical sciences and engineering.
- To develop an understanding of the use of Laplace Transforms to solve problems arising in the physical sciences and engineering.
- To develop an understanding of the use of approximation techniques to analyze problems arising in the physical sciences and engineering.
- To learn to communicate the solutions of technical problems to others.
- To develop improved collaborative skills.

## VII. Assessment Strategy

For the purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of ordinary differential equations to physical science and engineering.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and receive credit accordingly.
- Weekly structured cooperative learning activities to provide practice in "real-world" problem-solving skills.
- Three class-length in-class tests to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.
- Team projects or presentations can be used as part of the special projects and activities.

The final grades and team projects or presentations will be included in the student's portfolio for use in the final assessment capstone course. The intent here is to document the student's maturation as he proceeds through the curriculum.

Students' final grades will be based on 10% credit for the quizzes, 10% for cooperative learning exercises, 45% for the tests, 30% for the final exam, and 5% for team projects or presentations.

## VIII. Course Format

Instruction: Primary instruction is in a lecture format with the course meeting three times per week for one hour each meeting. At least once per week, the students should be allowed to work in class for at least 30 minutes in groups of two or three on an application problem chosen from the text by the instructor.

Web supplement: Course home page on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail (an active utility)
- Course discussion list (an active utility)
- Student course grades (an active utility)

**Classroom Hours** (4 hours per week) **Class:** 3
**Recitation:** 1

## IX. Topics to be Covered

A. First order differential equations
   1. Basic concepts
   2. Direction fields
   3. Separable differential equations
   4. Modeling: separable equations
   5. Exact differential equations, integrating factors
   6. Linear differential equations
   7. Modeling: electric circuits

B. Linear second order differential equations
   1. Homogeneous linear equations of second order
   2. Second order homogeneous equations with constant coefficients
   3. Complex exponential function
   4. Euler-Cauchy equation

5. Non-homogeneous equations
6. Solution by undetermined coefficients
7. Solution by variation of parameters
8. Higher order differential equations
9. Higher order homogeneous equations with constant coefficients
10. Higher order non-homogeneous equations

C. Laplace Transforms
1. Inverse transforms, linearity, and shifting
2. Transforms of derivatives and integrals
3. Step functions, second shifting, and Dirac's Delta Function
4. Differentiation and integration of transforms
5. Convolution
6. Partial fractions
7. General formulas
8. Table of Laplace Transforms

D. Fourier Series and integrals
1. Periodic functions and trigonometric series
2. Fourier series
3. Functions of Period p=2L
4. Even and odd functions
5. Fourier integrals (optional if time permits)
6. Fourier cosine and sine transforms (optional if time permits)
7. Fourier transform (optional if time permits)

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

This course has no technology component other than use of students' personal laptop computers as appropriate.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on "real-world" applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Dennis G. Zill, A First Course in Differential Equations with Modeling Applications, Metric Version, 10th Edition, by Cengage Learning.

ISBN: 978-1-305-97061-8

B. Alternative Textbooks

None

C. Supplemental Print Materials

As available from publisher.

D. Supplemental Online Materials

As available from publisher.

**Course Title: MATH 3433: Differential Equations and Linear Algebra**

**Semester Credit Hours: 4 (4,1)**

## I. Course Overview

MATH 3433 covers topics involving single variable differential equations. These include methods for solving first and second order differential equations, and Laplace transforms. Students acquire mathematical knowledge and skills to model and solve problems arising from engineering. MATH 3433 also covers topics of matrix algebra and linear spaces. Linear transformations are discussed in detail including matrix representations and similarity. The course concludes with a discussion of linear systems of differential equations. The major emphasis is on modeling and solving problems arising in the computer sciences and computer engineering.

## II. PMU Competencies and Learning Outcomes

Students of MATH 3433 will develop the skills needed to model problems arising in the physical sciences and engineering. These skills will enhance their ability to analyze and solve problems in engineering and communicate their solutions to fellow professionals using the language of mathematics. Students will continue to use the Web-based course supplement to access course materials and communicate with classmates and the instructor. They will enhance teamwork and leadership skills by working in groups to achieve the solutions to designated exercises.

## III. Detailed Course Description

MATH 3433 develops the basic methods for solving first order differential equations. These include separation of variables, exact differential equations, and integrating factors. Problems arising from the computer science and engineering involving such equations are modeled and solved. Second order linear differential equations, both homogeneous and non-homogeneous, are discussed using the methods of undetermined coefficients and variation of parameters. Laplace transforms are covered in some detail including transformations of derivatives and integrals. Matrix topics include systems of linear equations, row echelon form, matrix algebra, elementary matrices, and determinants. Vector space topics include subspaces, linear combinations and independence, basis and dimension, row and column spaces. Eigenvalues and eigenvectors, and powers of matrices are discussed in details. The course concludes with a discussion of linear systems of differential equations. This includes discussion of first-order systems, matrices and linear systems of ODE, and the eigenvalue method for linear systems. The major emphasis is on modeling and solving problems arising in the computer sciences and computer engineering.

## IV. Requirements Fulfilled

MATH 3433 satisfies four hours of the College Core mathematics requirements. It is a required course for students majoring in Computer Science, Computer Engineering, and Software Engineering. It should be taken immediately after completion of MATH 1324: Calculus III.

## V. Required Prerequisites

MATH 1324: Calculus III

## VI. Learning Outcomes

Students will be able to:

- To develop skills in modeling problems arising from the computer sciences and computer engineering.
- To use the basic methods from differential equations to solve problems arising from the computer sciences and computer engineering.

- To develop an understanding of the use of Laplace Transforms to solve problems arising in the computer sciences and computer engineering.
- To develop understanding of vector spaces in three and higher dimensions.
- To develop an understanding of how matrix algebra and vector space concepts are used to solve problems arising in the computer sciences and computer engineering.
- To develop an understanding of how matrix algebra and eigenvalues are used to solve differential equations problems arising in the computer sciences and computer engineering.
- To learn to communicate the solutions of technical problems to others.
- To develop improved collaborative skills

## VII. Assessment Strategy

For the purpose of final course grades (summative assessment), students should be assessed via their performance on in-class quizzes and exams that focus on the applications of ODE and linear algebra to physical science and engineering.

- Weekly 15-minute, in-class quizzes over assigned homework to motivate students to do the work and earn credit accordingly.
- Weekly cooperative learning group exercises to provide practice in team problem-solving skills.
- Three class-length in-class exams to assess students' accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess students' accumulative mastery of course material.

Feedback from the instructor (formative assessment) should come via the students' reflective notebooks.

- At the end of each week the instructor collects the students' notebooks, reads the students' reflections and chosen problems for that week, and enters appropriate written responses into the notebooks.

Final grades and the student and instructor observations from reflective notebooks will be included in the student's portfolio for use in the final assessment capstone course. The intent is to document the student's maturation has he proceeds through the curriculum.

## VIII. Course Format

Instruction: Primary instruction is a lecture format, with the course meeting three times per week for one hour each meeting. At least once per week, the students should be allowed to work in class for at least 30 minutes in groups of two or three on an application problem chosen from the text by the instructor.

Web supplement: Course home page on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Keys to quizzes and exams (after students have completed them)
- Course calendar (an active utility)
- Course e-mail (an active utility)
- Course discussion list (an active utility)
- Student course grades (an active utility)

**Classroom Hours** (5 hours per week) **Class:** 4
**Recitation:** 1

## IX. Topics to be Covered

A. First-Order Differential Equations

1. Differential Equations and Mathematical Models
2. Integrals as General and Particular Solutions
3. Separable Equations and Applications
4. Linear First-Order Equations
5. Substitution Methods and Exact Equations

B. Linear Systems and Matrices

1. Introduction to Linear Systems
2. Matrices and Gaussian Elimination
3. Reduced Row-Echelon Matrices
4. Matrix Operations
5. Inverses of Matrices
6. Determinants

C. Vector Spaces

1. The Vector Space R3
2. The Vector Space Rn and Subspaces
3. Linear Combinations and Independence of Vectors
4. Bases and Dimension for Vector Spaces

D. Higher-Order Linear Differential Equations

1. Introduction: Second-Order Linear Equations
2. General Solutions of Linear Equations
3. Homogeneous Equations with Constant Coefficients
4. Mechanical Vibrations
5. Nonhomogeneous Equations and Undetermined Coefficients

E. Eigenvalues and Eigenvectors

1. Introduction to Eigenvalues
2. Diagonalization of Matrices
3. Applications Involving Powers of Matrices

F. Laplace Transform Methods

1. Laplace Transforms and Inverse Transforms
2. Transformation of Initial Value Problems
3. Translation and Partial Fractions

G. Linear Systems of Differential Equations

1. First-Order Systems and Applications
2. Matrices and Linear Systems
3. The Eigenvalue Method for Linear Systems
5. Multiple Eigenvalue Solutions

## X. Laboratory Exercises

This course does not require a separate lab other than the recitation section.

## XI. Technology Component

This course has no technology component other than use of students' personal laptop computers as appropriate.

## XII. Special Projects/Activities

Special projects and activities can include team presentations which focus on "real-world" applications.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Henry Edwards and David E. Penney, *Differential Equations and Linear Algebra*, 3rd Edition, C., ISBN-13: 9780136054252 Pearson Higher Education.

B. Alternative Textbooks
None

C. Supplemental Print Materials

As available from publisher.

D. Supplemental Online Materials
As available from publisher.

# D. COLLEGE CORE CURRICULUM

## Natural and Physical Sciences

| | |
|---|---|
| BIOL1411: | Introductory Biology |
| CHEM 1411: | Introductory Chemistry |
| CHEM 1421: | Chemistry for Engineers I |
| CHEM 1422: | Chemistry for Engineers II |
| GEOL 1411: | Introductory Physical Geology |
| PHYS 1411: | Introductory Physics |
| PHYS 1421: | Physics for Engineers I |
| PHYS 1422: | Physics for Engineers II |

**COURSE TITLE: BIOL 1411: Introductory Biology**

**Semester Credit Hours: 4 (3, 3)**

### I. Course Overview

The objective of BIOL 1411 is to provide students with a foundation in basic biological principles. Students will gain familiarity with the biological world from both a taxonomic perspective (plant, animal, microbes) and process-based perspective (biochemistry, cell biology, physiology, ecology, behavior). Additionally, students will learn to integrate biological material into the broader world around them, and develop critical thinking and problem solving skills involving quantitative data from the natural sciences. This course is in the format of a three-credit lecture session and a mandatory, separately scheduled one-credit laboratory that accompanies it.

### II. PMU Competencies and Learning Outcomes

Students of BIOL 1411 successfully graduating from this course will understand the Scientific Method, and will receive training in contemporary methodologies in the biological sciences. They will learn to generate data both individually, as well as in a cooperative effort in a small team setting. Students will learn to organize and critically analyze their data, using statistical and graphing tools where appropriate. Finally, students of BIOL 1411 will learn to communicate their conclusions in writing in a discipline-appropriate format.

### III. Detailed Course Description

Topics covered in this course include cell biology, genetics, physiology, ecology, diversity of living

organisms, evolution, interrelationships of structure and function, self- regulation, and capture and use of energy. A brief survey of plants and animals will be included, as well as especially physiological aspects of human anatomy and physiology.

## IV. Requirements Fulfilled

This course is a College Core course and serves in partial fulfillment of the eight-credit science requirement. BIOL 1411 is a recommended elective for all students and required of all students contemplating basic science training.

## V. Required Prerequisites

BIOL 1411 does not have a prerequisite. However, successful completion of an introductory course in biology, geology chemistry or physics at the high school level will be helpful. This course should be taken as early as possible because of the organizational, analytical and communicative skills that it develops.

## VI. Learning Outcomes

- To learn the Scientific Method and how to use the Scientific Method to test hypotheses.
- To learn the basic principles of biology as they apply to the existence of a diverse array of living organisms.
- To develop an understanding of Cellular and Molecular Biology.
- To develop an understanding of the natural biological world.
- To learn how plants, animals and microbes co-exist and share common principles with respect to energy acquisition and use, reproduction and evolution.
- To learn how to create a hypothesis and then test it.
- To learn how to organize, analyze data, and then present logical, compelling scientific arguments.

## VII. Assessment Strategy

Assessment for this course will consist of a combination of examinations based on lecture materials, examinations based on laboratory materials, and grades provided on submitted written materials, primarily from the laboratory exercises. Specific assessment will include:

- A series of four written tests testing the detailed knowledge of short sections of the course (each exam worth 12.5% of the final grade for a total of 50%)
- A final, comprehensive written exam (25% of the final grade)
- Laboratory grade forming 25% of the course.

Because understanding of biological principles is best achieved when accompanied by their implementation in a lab setting, significant emphasis will be placed on the lab experience, including lab attendance. Students should be aware that one of the most common reasons for low achievement in this course is failure to regularly attend and participate in the laboratory section of the course.

This science course will teach students how to work both individually and in a small team setting. The comprehensive exams will encourage students to integrate what they have learned from individual lectures or experiments into a more comprehensive understanding of the subject matter, and as such will begin at an early stage in the student's university education to build the skills and understanding that will be necessary for the capstone course in their discipline.

## VIII. Course Format

The course will consist of a combination of lecture presentations and a mandatory, separate laboratory class.

Attendance in both lecture and laboratory is mandatory. Lectures will consist primarily of presentation and discussion of material outlined below. Occasional films and Web-based

presentations will be made. Laboratories will consist of an initial presentation/demonstration by the laboratory instructor, followed by laboratory exercises completed in small groups of three to four students.

A key feature will be the creation of data, the analysis of that data, and the communication of the findings in the form of a series of written laboratory reports.

Web supplement: The course homepage (using suitable commercial Web tool) will include:

- Course syllabus
- Course assignments
- Keys to quizzes and exams
- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours** (6 hours per week) **Class:** 3
**Lab:** 3

## IX. Topics to Be Covered

A. Introduction / the study of life
B. The Scientific Method
C. Molecules of cells
D. Cell structure and function
E. Membrane structure and function
F. Cell division, replication and energetics
G. DNA and RNA structure and replication
H. Patterns of gene inheritance
I. Evolution
J. Diversity of organisms
K. Ecology
L. Microbiology
M. Structure and function of plants - Overview
N. Structure and function of animals - Overview
O. Human anatomy – Overview
P. Human physiology – Overview

## X. Laboratory Exercises

The laboratory component of this course will consist of a weekly series of three-hour laboratory exercises. The topics to be covered, in order, are:

A. Introduction and science lab safety
B. Scientific Method
C. Microscopy and cell structure
D. Cell function
E. Mitosis and meiosis
F. DNA isolation
G. Mendelian genetics
H. Human genetics
I. Taxonomy
J. Plant biology
K. Animal behavior
L. Basic mammalian anatomy
M. Cardiovascular system
N. Reproductive system and development

## XI. Technology Component

A. In Class

Faculty and laboratory instructors will use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis. Laboratories will use computerized projection equipment and data recording and analyzing equipment, either as demonstrations or as part of small team laboratory exercises.

B. Outside of Class

Faculty will provide e-mail and/or Web site interaction regarding the course material, and will post materials on a dedicated course Web site. Students will be able to ask questions, observe and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

## XII. Special Projects/Activities

This course does not require a special project.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Urry, Lisa A. and Michael L. Cain, *Campbell Biology*, Pearson; 11th edition (October 29, 2016), ISBN: 978-0134093413

B. Alternative Textbooks

Audesirk, Teresa, Gerald Audesirk, and Bruce Byers, *Life on Earth*, 5th Edition, Upper Saddle River, New Jersey: Prentice Hall, 2003.

ISBN 0321598466

Sadaya, David E. and David M. Hillis, Life: The Science of Biology, W. H. Freeman; 11th edition (December 1, 2016) ISBN: 978-1319010164

C. Supplemental Print Materials

1. Mader, Sylvia, *Laboratory Manual to Accompany Inquiry Into Life,* Tenth Edition, New York, New York: McGraw Hill, 2002. ISBN: 0072437367
2. Other supplemental print materials as provided by the publisher.

D. Supplemental Online Materials

1. Other supplemental online materials as provided by the publisher.
2. Instructors will develop a list of suitable, contemporary Web sites that are appropriate for the topics and level of detail that they will teach.

**COURSE TITLE: CHEM 1411: Introductory Chemistry**

**Semester Credit Hours: 4 (3, 3)**

## I. Course Overview

The objective of CHEM 1411 is to provide students with a foundation in basic chemical principles. Students will be introduced to chemistry at a basic, fundamental level. They will gain familiarity with chemical equations and reactions, and will be given the tools necessary to solve chemical problems that they might encounter on a daily basis. An important component will be to understand the impact of chemistry on all aspects of humans and human civilization. Students will learn to integrate chemical understanding the broader world around them, and develop critical thinking and problem solving skills involving quantitative data from the natural sciences. This course is in the format of a three-credit lecture session and a mandatory, separately scheduled, one-credit laboratory that accompanies it.

## II. PMU Competencies and Learning Outcomes

Students of CHEM 1411 successfully graduating from this course will understand the Scientific Method, and will receive training in contemporary methodologies in the chemical sciences. They will learn to generate data both individually, as well as in a cooperative effort in a small team setting. Students will learn to organize and critically analyze their data, using statistical and graphing tools where appropriate. Finally, students of CHEM 1411 will learn to communicate their conclusions in writing in a discipline-appropriate format.

## III. Detailed Course Description

Topics covered in this course include a basic introduction to matter and energy and how they are interrelated. Elements, atoms and modern atomic theory will form the base for understanding how chemical components interact through chemical reactions. Students will learn how chemical reactions are described and how they are governed. Finally, the properties of different physical phases of matter (gases, liquids and solids) will be investigated.

## IV. Requirements Fulfilled

This course is a College Core course and serves in partial fulfillment of the eight-credit science requirement. CHEM 1310 is a recommended elective for all students and required of all students contemplating basic science training.

## V. Required Prerequisites

PRPM 0011: Introductory Algebra.

## VI. Learning Outcomes

- To learn the basic principles of chemistry as they apply to energy, matter, and other aspects of the physical world that surrounds us.
- To develop an understanding of chemical processes, and the interdependence of chemistry with both physics and mathematics.
- To develop fundamental laboratory skills.
- To learn to use chemical terms correctly.
- To learn how chemical processes are dynamic and ongoing, and influence daily events in societies around the world.

- To learn the basic properties of solids, liquids, and gases.
- To learn the Scientific Method and how to use the Scientific Method to create and test hypotheses.
- To learn how to organize, analyze data, and then present logical, compelling scientific arguments.

## VII. Assessment Strategy

Assessment for this course will consist of a combination of examinations based on lecture materials, examinations based on laboratory materials, and grades provided on submitted written materials, primarily from the laboratory exercises. Specific assessment will include:

- A series of four written tests testing the detailed knowledge of short sections of the course (each exam worth 12.5% of the final grade for a total of 50%)
- A final, comprehensive written exam (25% of the final grade)
- Laboratory grade forming 25% of the course.

Because understanding of chemistry is best achieved when accompanied by their implementation in a lab setting, significant emphasis will be placed on the lab experience, including lab attendance. Students should be aware that one of the most common reasons for low achievement in this course is failure to regularly attend and participate in the laboratory section of the course.

This science course will teach students how to work both individually and in a small team setting. The comprehensive exams will encourage students to integrate what they have learned from individual lectures or experiments into a more comprehensive understanding of the subject matter, and as such will begin at an early stage in the student's university education to build the skills and understanding that will be necessary for the capstone course in their discipline.

## VIII. Course Format

The course will consist of a combination of lecture presentations and a mandatory, separate laboratory class.

Attendance in both lecture and laboratory is mandatory. Lectures will consist primarily of presentation and discussion of material outlined below.

Occasional films and Web-based presentations will be made. Laboratories will consist of an initial presentation/demonstration by the laboratory instructor, followed by laboratory exercises completed in small groups of two to three students. A key feature will be the creation of data, the analysis of that data, and the communication of the findings in the form of a series of written laboratory reports.

Web supplement: The course homepage (using suitable commercial Web tools) will include:

- Course syllabus
- Course assignments
- Keys to quizzes and exams
- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours** (6 hours per week) **Class:** 3
**Lab:** 3

## IX. Topics to Be Covered

A. Introduction to chemistry
B. The Scientific Method
C. Introduction, measurements and calculations
D. Matter (solids, liquids, gases) and energy
E. Elements and atoms

F. Modern Atomic Theory
G. Chemical bonding
H. Elements, ions and nomenclature
I. Chemical reactions
J. Reactions in aqueous solutions
K. Acids and Bases
L. Chemical composition
M. Balancing chemical reactions
N. Gases
    1. Pressure
    2. Volume
    3. Temperature
O. Nuclear chemistry

## X. Laboratory Exercises

The laboratory component of this course will consist of a series of weekly three-hour laboratory exercises. The topics to be covered, in order, are:

A. Introduction and science lab safety
B. Scientific Method, measurements and the metric system
C. Physical and chemical properties of substances
D. Chemical reactions and equations
E. Periodic table exercise, nomenclature practice
F. Mixtures, physical separation and solubility
G. Chemical changes and reactions
H. Indicators, acids and bases
I. Hydrates, percent composition, and formulas
J. Stoichiometry of chemical reactions

## XI. Technology Component

A. <u>In Class</u>

Faculty and laboratory instructors will use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis. Laboratories will use computerized projection equipment and data recording and analyzing equipment, either as demonstrations or as part of small team laboratory exercises.

B. <u>Outside of Class</u>

Faculty will provide e-mail and/or Web site interaction regarding the course material, and will post materials on a dedicated course Web site. Students will be able to ask questions, observe and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

## XII. Special Projects/Activities

This course does not require a special project.

## XIII. Textbooks and Teaching Aids

A. <u>Required Textbook</u>

Tro, Nivaldo, J., *Introductory Chemistry* (6th edition), Pearson College Division, 2017. ISBN: 0134302389

B. <u>Alternative Textbooks</u>

Most introductory chemistry textbooks would be adequate, though some confusion might arise

from small differences in order of presentation.

C. Supplemental Print Materials

Other supplemental print materials as provided by the publisher.

D. Supplemental Online Materials

1. Other supplemental online materials as provided by the publisher.
2. Instructors will develop a list of suitable, contemporary Web sites that are appropriate for the topics and level of detail that they will teach.

**COURSE TITLE: CHEM 1421: Chemistry for Engineers I**

**Semester Credit Hours: 4 (3, 3)**

## I. Course Overview

The objective of CHEM 1421 is to create a substantial base for a two-semester chemistry sequence to provide the additional chemistry required by engineering students prior to specialized courses in chemical engineering applications. This course is not to be taken by non-engineering students. The approach, like that of the following semester CHEM 1422, will be largely conceptual leading to an understanding of chemistry and chemical processes. Students in this course will gain familiarity with the chemical/atomic structure of ions, molecules and atoms and how they react. Emphasis will be on a quantitative approach involving chemical reactions and their control. This course is in the format of a three-credit lecture session and a mandatory, separately scheduled, one-credit laboratory that accompanies it.

## II. PMU Competencies and Learning Outcomes

Students of CHEM 1421 successfully graduating from this course will receive training in contemporary methodologies in chemistry forming a suitable base for the additional chemistry required of engineers. They will learn to generate data both individually, as well as in a cooperative effort in a small team setting. Students will learn to organize and critically analyze their data, using statistical and graphing tools where appropriate. Finally, students of CHEM 1421 will learn to communicate their conclusions in writing in the form of a scientific journal article.

## III. Detailed Course Description

Topics covered in this course create a base in chemistry that will be subsequently used in CHEM 1422. Beginning with an introduction to chemistry, this course will delve into atomic structure, ions and molecules. Students will learn to quantify chemical reactions, and how reactions occur in gases, liquids and solids. The nature of chemical bonding and the forces controlling it will be considered, as will molecular geometry as it relates to chemical structure. Each topic will build upon the growing base formed by previously learned material.

## IV. Requirements Fulfilled

CHEM 1412 satisfies the first semester of the two-semester chemistry requirement for engineering

students.

## V. Required Prerequisites

PRPM 0022: Pre-Calculus.

## VI. Learning Outcomes

- To appreciate atomic structure, and the periodic interrelationships of elements.
- To achieve an understanding of how chemical bonds form, are broken, and the implications for chemical reactions.
- To learn the chemical properties of gases, liquids and solids.
- To understand how the chemical nature of substances and their interactions underlies many engineering applications.
- To learn scientific skills, how to organize and analyze chemical data, and then present logical, compelling scientific arguments based on these data.
- To understand the complementary nature of topics in chemistry, and how each new piece of information builds on forming a conceptual base.

## VII. Assessment Strategy

Assessment for this course will consist of a combination of examinations based on lecture materials, examinations based on laboratory materials, and grades provided on submitted written materials, primarily from the laboratory exercises. Specific assessment will include:

- A series of four written tests testing the detailed knowledge of short sections of the course (each exam worth 12.5% of the final grade for a total of 50%)
- A final, comprehensive written exam (25% of the final grade)
- Laboratory grade forming 25% of the course.

Because understanding of chemistry is best achieved when accompanied by their implementation in a lab setting, significant emphasis will be placed on the lab experience, including lab attendance. Students should be aware that one of the most common reasons for low achievement in this course is failure to regularly attend and participate in the laboratory section of the course.

This science course will teach students how to work both individually and in a small team setting. The comprehensive exams will encourage students to integrate what they have learned from individual lectures or experiments into a more comprehensive understanding of the subject matter, and as such will begin at an early stage in the student's university education to build the skills and understanding that will be necessary for the capstone course in their discipline.

## VIII. Course Format

The course will consist of a combination of lecture presentations and a mandatory, separate laboratory class.

Attendance in both lecture and laboratory is mandatory. Lectures will consist primarily of presentation and discussion of material outlined below. Occasional films and Web-based presentations will be made. Laboratories will consist of an initial presentation/demonstration by the laboratory instructor, followed by laboratory exercises completed in small groups of two to three students. A key feature will be the creation of data, the analysis of that data, and the communication of the findings in the form of a series of written laboratory reports.

Web supplement: The course homepage (using suitable commercial Web tools) will include:

- Course syllabus
- Course assignments
- Keys to quizzes and exams

- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours** (6 hours per week) **Class:** 3
**Lab:** 3

## IX. Topics to Be Covered

A. Introduction to chemistry
B. Ions, molecules and atoms
C. Quantifying chemical relationships and reactions
D. Aqueous reactions/solutions chemistry
E. Gas behavior and properties
F. Thermochemistry
G. Atomic structure
H. Quantum theory
I. Periodic relationship of elements
J. General concepts of chemical bonding
K. Molecular geometry and hybridization

## X. Laboratory Exercises

The laboratory component of this course will consist of a weekly series of three-hour laboratory exercises. The topics to be covered, in order, are:

A. Orientation and chemistry lab safety
B. Unknown identifications using substance properties
C. Quantitative separation of mixture components
D. Solubility of salts
E. Chemical reaction classifications
F. Empirical formula determinations
G. Reactions in chemical solutions
H. Enthalpy changes in chemical systems
I. R – ideal gas constant
J. Molecular mass of volatile compounds
K. Diffusion in gases
L. Chemical synthesis
M. Molecular geometry

## XI. Technology Component

A. <u>In Class</u>

Faculty and laboratory instructors will use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis. Laboratories will use computerized projection equipment and data recording and analyzing equipment, either as demonstrations or as part of small team laboratory exercises.

B. <u>Outside of Class</u>

Faculty will provide e-mail and/or Web site interaction regarding the course material, and will post materials on a dedicated course Web site. Students will be able to ask questions, observe and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

## XII. Special Projects/Activities

This course does not require a special project.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Brown, Larry and Tom Holme, *Chemistry for Engineering Students,* 3rd edition, Brooks Cole, 2014
ISBN: 1285199022

B. Alternative Textbooks

None

C. Supplemental Print Materials

Other supplemental print materials as provided by the publisher .

D. Supplemental Online Materials

1. Other supplemental online materials as provided by the publisher.
2. Instructors will develop a list of suitable, contemporary Web sites that are appropriate for the topics and level of detail that they will teach.

**COURSE TITLE: CHEM 1422: Chemistry for Engineers II**

**Semester Credit Hours: 4 (3, 3)**

## I. Course Overview

The objective of CHEM 1422 is to build upon the base provided in the prerequisite CHEM 1421, and to provide the additional chemistry required by engineering students prior to specialized courses in chemical engineering applications. This course is not to be taken by non-engineering students. The approach, like that of the CHEM 1421, will be largely conceptual leading to an understanding of chemistry and chemical processes. Students in this course will gain familiarity with the physical chemistry of liquids and solids, the nature of equilibrium, acids and bases, and thermodynamics and electrochemistry. This course is in the format of a three-credit lecture session and a mandatory, separately scheduled one-credit laboratory.

## II. PMU Competencies and Learning Outcomes

Students of CHEM 1422 successfully graduating from this course will receive training in contemporary methodologies in chemistry forming a suitable base for the additional chemistry required of engineers. They will learn to generate data both individually, as well as in a cooperative effort in a small team setting. Students will learn to organize and critically analyze their data, using statistical and graphing tools where appropriate. Finally, students of CHEM 1422 will learn to communicate their conclusions in writing in the form of a scientific journal article.

## III. Detailed Course Description

Topics covered in this course build upon the base received in CHEM 1421: Chemistry for Engineers I, and will begin with a discussion of the tools of chemistry. As in CHEM 1421, each topic builds upon the growing base formed by previously learned material

## IV. Requirements Fulfilled

CHEM 1422 satisfies the first semester of the two-semester chemistry requirement for engineering students.

## V. Required Prerequisites

MATH 1422: Calculus I
CHEM 1421: Chemistry for Engineers I

## VI. Learning Outcomes

- To understand how intermolecular forces result in the properties of liquids and solids.
- To investigate the kinetics of chemical reactions and to apply the general concepts involved in chemical equilibrium.
- To learn how acids and bases interact and the implications of pH to chemical reactions.
- To understand the laws of thermodynamics and their involvement in chemical reactions, including those with engineering applications.
- To learn scientific skills, how to organize and analyze chemical data, and then present logical, compelling scientific arguments based on these data.
- To understand the complementary nature of topics in chemistry, and how each new piece of information builds on forming a conceptual base.

## VII. Assessment Strategy

Assessment for this course will consist of a combination of examinations based on lecture materials, examinations based on laboratory materials, and grades provided on submitted written materials, primarily from the laboratory exercises. Specific assessment will include:

- A series of four written tests testing the detailed knowledge of short sections of the course (each exam worth 12.5% of the final grade for a total of 50%)
- A final, comprehensive written exam (25% of the final grade)
- Laboratory grade forming 25% of the course.

Because understanding of chemistry is best achieved when accompanied by their implementation in a lab setting, significant emphasis will be placed on the lab experience, including lab attendance. Students should be aware that one of the most common reasons for low achievement in this course is failure to regularly attend and participate in the laboratory section of the course.

This science course will teach students how to work both individually and in a small team setting. The comprehensive exams will encourage students to integrate what they have learned from individual lectures or experiments into a more comprehensive understanding of the subject matter, and as such will begin at an early stage in the student's university education to build the skills and understanding that will be necessary for the capstone course in their discipline.

## VIII. Course Format

The course will consist of a combination of lecture presentations and a mandatory, separate laboratory class.

Attendance in both lecture and laboratory is mandatory. Lectures will consist primarily of presentation and discussion of material outlined below. Occasional films and Web-based presentations will be made. Laboratories will consist of an initial presentation/demonstration by the laboratory instructor, followed by laboratory exercises completed in small groups of two to three students. A key feature will be the creation of data, the analysis of that data, and the communication of the findings in the form of a series of written laboratory reports.

Web supplement: The course homepage (using suitable commercial Web tools) will include:

- Course syllabus
- Course assignments
- Keys to quizzes and exams
- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours** (6 hours per week) **Class:** 3
**Lab:** 3

## IX. Topics to Be Covered

A. Intermolecular forces
B. Liquids and solids
C. Physical properties of solutions
D. Chemical kinetics and reaction speed
E. General concepts in chemical equilibria
F. Acids and bases
G. Acid-base solubility equilibria
H. Thermodynamics, entropy, free energy and equilibria
I. Electrochemistry
J. Nuclear chemistry
K. Metals and solid-state metals

## X. Laboratory Exercises

The laboratory component of this course will consist of a weekly series of three-hour laboratory exercises. The topics to be covered, in order, are:

A. Orientation and chemistry lab safety
B. Stoichiometry
C. Enthalpy and substance phase changes
D. Colligative properties of solutions
E. Titration and neutralization reactions
F. Analysis of an acid
G. Chemical reaction rates
H. Equilibrium constant determination
I. Acid-base properties of salt solutions
J. Solubility product constant determination
K. Chromatography for mixture separation
L. Identification of unknowns: Cation
M. Identification of unknowns: Anion
N. Chemical synthesis
O. Titration: oxidation and reduction
P. Electrochemistry and electrochemical cells

## XI. Technology Component

A. In Class

Faculty and laboratory instructors will use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis. Laboratories will use computerized projection equipment and data recording and analyzing equipment, either as demonstrations or as part of small team laboratory exercises.

B. Outside of Class

Faculty will provide e-mail and/or Web site interaction regarding the course material, and will post materials on a dedicated course Web site. Students will be able to ask questions, observe and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

## XII. Special Projects/Activities

This course does not require a special project.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Brown, Larry and Tom Holme, Chemistry for Engineering Students, 3rd edition, Brooks Cole, 2014 ISBN: 1285199022.

B. Alternative Textbooks

None

C. Supplemental Print Materials

Other supplemental print materials as provided by the publisher.

D. Supplemental Online Materials

1. Other supplemental online materials as provided by the publisher.
2. Instructors will develop a list of suitable, contemporary Web sites that are appropriate for the topics and level of detail that they will teach.

**Course Title: GEOL 1411: Introductory Physical Geology**

**Semester Credit Hours: 4 (3, 3)**

## I. Course Overview

The objective of GEOL 1411 is to provide students a foundation in the scientific method, geologic processes that shape the earth, and methodologies used in the geological sciences. Students will gain familiarity with topics such as the earth's composition and the geologic processes at work in the world. An important component will be an understanding of the interactions between humans, human civilization, and geologic processes. Additionally, students will learn about geologic hazards and how they can be detected and monitored. Students will learn to integrate their knowledge of geology into the broader world around them, and develop critical thinking and problem-solving skills involving quantitative data. This course consists of a three-credit lecture session and a mandatory, separately scheduled one-credit laboratory.

## II. PMU Competencies and Learning Outcomes

Students who successfully complete this course will understand the Scientific Method and the methodologies in used in geological sciences. They will learn to generate data individually, as well as in a cooperative effort in a small team setting. Students will learn to organize and critically analyze their data, using statistical and graphing tools where appropriate. Finally, students of GEOL 1411 will learn to communicate their conclusions in writing, using a discipline-appropriate format.

## III. Detailed Course Description

Topics covered in this course include minerals and the three types of rocks and how these rocks are created. The course will also cover the various mechanisms that cause erosion, transportation, deposition of sediment, and mass wasting; the nature and occurrence of groundwater; and the unique geology of deserts and shorelines. Plate tectonics, earthquakes, volcanism, and the interior of the earth will be investigated as well. A final chapter on global climate change will also be covered, with an emphasis on using geologic processes to evaluate climate change in the geologic past. While world geology will be the covered, emphasis will be placed on Middle Eastern geology where appropriate.

## IV. Requirements Fulfilled

This course is a College Core course and serves in partial fulfillment of the eight-credit science requirement. GEOL 1411 is a recommended elective for all students and required of all students contemplating basic science training.

## V. Required Prerequisites

PRPM 0011: Introductory Algebra.

## VI. Learning Outcomes

- To learn the Scientific Method, and how to create a hypothesis and test it using the Scientific Method.
- To learn the basic principles of geology.
- To develop an understanding of geologic processes.
- To learn how geologic processes are dynamic and ongoing, and influence daily events in societies around the world.
- To learn how to organize and analyze data, and to present logical, compelling scientific arguments.

## VII. Assessment Strategy

Assessment for this course will consist of a combination of examinations based on lecture materials, examinations based on laboratory materials, and grades provided on submitted written materials, primarily from the laboratory exercises. Specific assessment will include:

- A series of four written tests testing the detailed knowledge of short sections of the course (each exam worth 12.5% of the final grade for a total of 50%)
- A final, comprehensive written exam (25% of the final grade)
- Laboratory grade forming 25% of the course.

This science course will teach students how to work both individually and in a small team setting. The comprehensive exams will encourage students to integrate what they have learned from individual lectures or experiments into a more comprehensive understanding of the subject matter, and as such will begin at an early stage in the student's university education to build the skills and understanding that will be necessary for the capstone course in their discipline.

## VIII. Course Format

The course will consist of a combination of lecture presentations and a mandatory, separate laboratory class.

Attendance in both lecture and laboratory is mandatory. Lectures will consist primarily of presentation and discussion of material outlined below. Occasional films and Web-based presentations will be made. Laboratories will consist of an initial presentation/demonstration by the laboratory instructor, followed by laboratory exercises completed in small groups of two to three students. A key feature will be the creation of data, the analysis of that data, and the communication of the findings in the form of a series of written laboratory reports.

Web supplement: The course homepage (using suitable commercial Web tools) will include:

- Course syllabus
- Course assignments
- Keys to quizzes and exams
- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours** (6 hours per week) **Class:** 3
**Lab:** 3

## IX. Topics to Be Covered

A. Introduction to physical geology
B. The Scientific Method and plate tectonics
C. Minerals
D. Igneous rocks
E. Volcanoes
F. Sedimentary rocks
G. Weathering and soils
H. Metamorphic rocks
I. Geologic time
J. Crustal deformation
K. Earthquakes and Earth's interior
L. Mass wasting
M. Running water
N. Groundwater

O. Glaciers
P. Deserts
Q. Shorelines
R. Global climate change

## X. Laboratory Exercises

A. Introduction and science lab safety
B. Plate tectonics
C. Minerals
D. Igneous rocks and radon
E. Sedimentary rocks
F. Metamorphic rocks
G. Geologic time
H. Maps and air photos
I. Rock deformation and geologic structures
J. Stream processes
K. Groundwater
L. Glaciers and deserts
M. Shorelines and ocean floors

## XI. Technology Component

A. In Class

Faculty and laboratory instructors will use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis. Laboratories will use computerized projection equipment and data recording and analyzing equipment, either as demonstrations or as part of small team laboratory exercises.

B. Outside of Class

Faculty will provide e-mail and/or Web site interaction regarding the course material, and will post materials on a dedicated course Web site. Students will be able to ask questions, observe and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

## XII. Special Projects/Activities

This course does not require a special project.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Tarbuck, Edward, Fredrick Lutgens, and Dennis Tasa, *Earth, An Introduction to Physical Geology,* 10th Edition, Prentice Hall, 2010.
ISBN 9780321663047

B. Alternative Textbooks

Most introductory geology textbooks would be adequate, though some confusion might arise from small differences in order of presentation.

C. Supplemental Print Materials

1. Busch, Richard, and Dennis Tasa, *Laboratory Manual in Physical Geology*, 9th Edition, Prentice Hall, 2011.
ISBN 9780321689573

D. Supplemental Online Materials

1. Other supplemental online materials as provided by the publisher for students to use in studying and understanding the material.
2. Instructors will develop a list of suitable, contemporary Web sites that are appropriate for the topics and level of det

**Course Title: PHYS 1411: Introductory Physics**

**Semester Credit Hours: 4 (3, 3)**

## I. Course Overview

The objective of PHYS 1411 is to investigate the fundamental principles that underlie the behavior of the universe. The approach will be largely a conceptual one that leads to an understanding of physics rather than just the ability to solve mathematical problems that are examples of physics. Students will gain familiarity with the forces and laws of nature that govern the physical world, from the sub-atomic to astronomical levels. Importantly, students will be guided through concepts in physics that ultimately let them recognize important, practical applications in the everyday world of fundamental physical principles. This course is in the format of a three-credit lecture session and a mandatory, separately scheduled one-credit laboratory that accompanies it. Fluid mechanics, thermodynamics, optics, sound, and basic electronics will be covered briefly in this course.

## II. PMU Competencies and Learning Outcomes

Students of PHYS 1411 successfully graduating from this course will understand the Scientific Method, and will receive training in contemporary methodologies in physics. They will learn to generate data both individually, as well as in a cooperative effort in a small team setting. Students will learn to organize and critically analyze their data, using statistical and graphing tools where appropriate. Finally, students of PHYS 1411 will learn to communicate their conclusions in writing in a discipline-appropriate format.

## III. Detailed Course Description

Topics covered in this course begin with consideration of classic Newtonian mechanics, including energy, work, position, velocity and acceleration. Lectures and labs will then focus on fluids, heat, light and optics, and sound, with an emphasis of practical implications of each of these concepts. Electricity and magnetism and their use in modern society will then be investigated. A brief survey of astronomy will indicate how physical principles apply in the cosmos as well as in our own homes. The course will conclude with a discussion of nuclear physics and energy production.

## IV. Requirements Fulfilled

This course is a College Core course and serves in partial fulfillment of the eight-credit science requirement. PHYS 1411 is a recommended elective for all students and required of all students contemplating basic science training.

## V. Required Prerequisites

PRPM 0011: Introductory Algebra.

## VI. Learning Outcomes

- To learn the basic principles of physics as they apply to the physical world that surrounds us.
- To develop an understanding of energy, work, efficiency, and other concepts in the natural world.
- To learn how physics influences everyday events in our societies.
- To learn how to create a hypothesis, and then test it.
- To learn the Scientific Method, and how to use the Scientific Method to test hypotheses.
- To learn how to organize, analyze data, and then present logical, compelling scientific arguments.

## VII. Assessment Strategy

Assessment for this course will consist of a combination of examinations based on lecture materials, examinations based on laboratory materials, and grades provided on submitted written materials, primarily from the laboratory exercises. Specific assessment will include:

- A series of four written tests testing the detailed knowledge of short sections of the course (each exam worth 12.5% of the final grade for a total of 50%)
- A final, comprehensive written exam (25% of the final grade)
- Laboratory grade forming 25% of the course.

This science course will teach students how to work both individually and in a small team setting. The comprehensive exams will encourage students to integrate what they have learned from individual lectures or experiments into a more comprehensive understanding of the subject matter, and as such will begin at an early stage in the student's university education to build the skills and understanding that will be necessary for the capstone course in their discipline.

## VIII. Course Format

The course will consist of a combination of lecture presentations and a mandatory, separate laboratory class.

Attendance in both lecture and laboratory is mandatory. Lectures will consist primarily of presentation and discussion of material outlined below. Occasional films and Web-based presentations will be made. Laboratories will consist of an initial presentation/demonstration by the laboratory instructor, followed by laboratory exercises completed in small groups of two to three students. A key feature will be the creation of data, the analysis of that data, and the communication of the findings in the form of a series of written laboratory reports.
Web supplement: The course homepage (using suitable commercial Web tools) will include:

- Course syllabus
- Course assignments
- Keys to quizzes and exams
- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours** (6 hours per week) **Class:** 3
**Lab:** 3

## IX. Topics to Be Covered

A. Introduction to physics
B. Newtonian mechanics
C. Position, velocity, and acceleration
D. Newton's laws of motion and units
E. Work, kinetic energy, and potential energy
F. Conservation of energy and efficiency in simple machines

G. Fluid mechanics: work and energy
H. Thermodynamics: work and energy
I. Conservation of energy related to thermodynamic systems
J. Light and optics, properties of light and wave motion
K. Laws of reflection and refraction, lenses and mirrors
L. Sound, properties of sound waves
M. Intensity and frequency of sound
N. Electricity
O. Units of electrical measurement, Ohm's law
P. Natural magnetism and electromagnetic devices
Q. History of astronomy, structure and origin of the Solar System
R. Atomic Physics
S. Nuclear equations, nuclear decay
T. Sub-atomic particles and their properties

## X. Laboratory Exercises

The laboratory component of this course will consist of a weekly series of three-hour laboratory exercises. The topics to be covered, in order, are:

A. Introduction and science lab safety
B. Scientific Method, quantitative reasoning
C. Metric system, measurement and calibration
D. Vectors and operation with vectors, refraction, mirrors and lenses
E. Force and motion
F. Center of gravity
G. Simple machines
H. Hydrostatic and Archimedes balance
I. Oscilloscope, circuits, wiring
J. Ohm's law, resistivity, diodes
K. KVL, KCL analysis for series and parallel circuit
L. Magnetism with a laboratory on radioactive half-life
N. Astronomy and astronomical observation

## XI. Technology Component

A. <u>In Class</u>

Faculty and laboratory instructors will use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis. Laboratories will use computerized projection equipment and data recording and analyzing equipment, either as demonstrations or as part of small team laboratory exercises.

B. <u>Outside of Class</u>

Faculty will provide e-mail and/or Web site interaction regarding the course material, and will post materials on a dedicated course Web site. Students will be able to ask questions, observe and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

C. <u>Web supplement</u>

The course homepage on the University's BLACKBOARD system includes the following.

- Course syllabus
- Course assignments
- Course e-mail utility
- Course discussion list
- Student course grades

## XII. Special Projects/Activities

This course does not require a special project.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Hewitt, Paul, *Conceptual Physics*, 9th Edition, San Francisco, California: Benjamin Cummings, 2002. ISBN: 0321052021

B. Alternative Textbooks

Griffith, W. Thomas and Juliet Brosing, The Physics of Everyday Phenomena,

McGraw-Hill Education; 8 edition (March 27, 2014) ISBN-13: 978-0073513904.

C. Supplemental Print Materials

Other supplemental print materials as provided by the publisher.

D. Supplemental Online Materials

1. Other supplemental online materials as provided by the publisher.
2. Instructors will develop a list of suitable, contemporary Web sites that are appropriate for the topics and level of detail that they will teach.

**Course Title: PHYS 1421: Physics for Engineers I**

**Semester Credit Hours: 4 (3, 3)**

## I. Course Overview

The objective of PHYS 1421 is to create a base for a two-semester physics sequence to provide the additional physics required by engineering students prior to specialized courses in engineering physics applications. This course is not to be taken by non-engineering students. The approach, like that of the following semester PHYS 1422, will be largely a conceptual leading to an understanding of physics rather than just the ability to solve mathematical problems that are examples of physics. Students in this course will gain familiarity with single particle kinematics and dynamics, multi-particle systems, and rotational motion. This course will also concentrate on the applied physics for engineers. This course is in the format of a three-credit lecture session and a mandatory, separately scheduled one-credit laboratory that accompanies it.

## II. PMU Competencies and Learning Outcomes

Students successfully graduating from this course will receive training in contemporary methodologies in physics forming a suitable base for the additional physics required of engineers. They will learn to generate data both individually, as well as in a cooperative effort in a small team setting. Students will learn to organize and critically analyze their data, using statistical and graphing tools where appropriate. Finally, students will learn to communicate their conclusions in writing in the form of a scientific journal article.

## III. Detailed Course Description

Topics covered in this course create a base in physics that will be subsequently used in PHYS 1422. Beginning with a discussion of the tools of physics, this course moves on to discuss motion and acceleration, Newton's Laws of physics, friction and the types of motions and their characteristics.

Momentum is investigated, along with the key forces of inertia, torque and angular momentum. In this course, each topic builds upon the growing base formed by previously learned material.

## IV. Requirements Fulfilled

PHYS 1421 satisfies the first semester of the two-semester physics requirement for engineering students.

## V. Required Prerequisites

MATH 1422: Calculus I.

## VI. Learning Outcomes

- To achieve a foundation for continuing studies in physics concepts and practices.
- To understand the relationship of mathematical representations to their associated physical principles and concepts.
- To learn how create a hypothesis and then test it.
- To learn the basic principles of Newtonian physics especially as they apply to engineering applications.
- To learn scientific skills, how to organize and analyze physical data, and then present logical, compelling scientific arguments based on these data.
- To understand the complementary nature of topics in physics, and how each new piece of information builds on a forming conceptual base.

## VII. Assessment Strategy

Assessment for this course will consist of a combination of examinations based on lecture materials, examinations based on laboratory materials, and grades provided on submitted written materials, primarily from the laboratory exercises. Specific assessment will include:

- A series of four written tests testing the detailed knowledge of short sections of the course (each exam worth 12.5% of the final grade for a total of 50%)
- A final, comprehensive written exam (25% of the final grade)
- Laboratory grade forming 25% of the course

This science course will teach students how to work both individually and in a small team setting. The comprehensive exams will encourage students to integrate what they have learned from individual lectures or experiments into a more comprehensive understanding of the subject matter, and as such will begin at an early stage in the student's university education to build the skills and understanding that will be necessary for the capstone course in their discipline.

## VIII. Course Format

The course will consist of a combination of lecture presentations and a mandatory, separate laboratory class.

Attendance in both lecture and laboratory is mandatory. Lectures will consist primarily of presentation and discussion of material outlined below Occasional films and Web-based presentations will be made. Laboratories will consist of an initial presentation/demonstration by the laboratory instructor, followed by laboratory exercises completed in small groups of two to three students. A key feature will be the creation of data, the analysis of that data, and the communication of the findings in the form of a series of written laboratory reports.

Web supplement: The course homepage (using suitable commercial Web tools) will include:

- Course syllabus

- Course assignments
- Keys to quizzes and exams
- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours** (6 hours per week) **Class:** 3
**Lab:** 3

## IX. Topics to Be Covered

A. Tools of physics
B. Speed, velocity, acceleration and motion
C. Vectors and scalars
D. Newton's Laws
E. Friction
F. Motion with constant acceleration, projectile and circular motion
G. Work, kinetic and potential energy, conservation of energy
H. Linear momentum, conservation of momentum, rotational kinematics
I. Inertia, torque, angular momentum
J. Gravity
K. Static Equilibrium and Elasticity.

## X. Laboratory Exercises

The laboratory component of this course will consist of a weekly series of three-hour laboratory exercises. The topics to be covered, in order, are:

A. Errors in measurement, accuracy, precision
B. Acceleration due to gravity
C. Projectile motion
D. Newton's Second Law
E. Centripetal force
F. Energy conservation, force and potential energy
G. Momentum conservation
H. The ballistic pendulum
I. Moment of inertia
J. Simple harmonic motion

## XI. Technology Component

A. <u>In Class</u>

Faculty and laboratory instructors will use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis. Laboratories will use computerized projection equipment and data recording and analyzing equipment, either as demonstrations or as part of small team laboratory exercises.

B. <u>Outside of Class</u>

Faculty will provide e-mail and/or Web site interaction regarding the course material, and will post materials on a dedicated course Web site. Students will be able to ask questions, observe and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

C. <u>Web supplement</u>

The course homepage on the University's BLACKBOARD system includes the following.

- Course syllabus

- Course assignments
- Course e-mail utility
- Course discussion list
- Student course grades

## XII. Special Projects/Activities

This course does not require a special project.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Tipler, Paul, and Gene Mosca, *Physics for Scientists and Engineers*, 6th Edition, W.H. Freeman, 2007.
ISBN 0716789647

B. Alternative Textbooks

None

C. Supplemental Print Materials

Other supplemental print materials as provided by the publisher.

D. Supplemental Online Materials

1. Other supplemental online materials as provided by the publisher.

2. Instructors will develop a list of suitable, contemporary Web sites that are appropriate for the topics and level of detail that they will teach.

**Course Title: PHYS 1422: Physics for Engineers II**

**Semester Credit Hours: 4 (3, 3)**

## I. Course Overview

The objective of the course is to build upon the base offered in PHYS 1421, and provide the additional physics required by engineering students prior to specialized courses in engineering physics applications. This course is not to be taken by non-engineering students. The approach, like that of the prerequisite PHYS 1421, will be largely a conceptual leading to an understanding of physics rather than just the ability to solve mathematical problems that are examples of physics. Students in this course will gain familiarity with electricity (both DC and AC circuits), magnetism, light, and physical optics. This course is in the format of a three-credit lecture session and a mandatory, separately scheduled one-credit laboratory that accompanies it.

## II. PMU Competencies and Learning Outcomes

Students successfully completing this course will receive training in contemporary methodologies in physics forming a suitable base for the additional physics required of engineers. They will learn to generate data both individually, as well as in a cooperative effort in a small team setting. Students will learn to organize and critically analyze their data, using statistical and graphing tools where appropriate. Finally, students will learn to communicate their conclusions in writing in the form of a scientific journal article.

## III. Detailed Course Description

Topics covered in this course build upon the base received in PHYS 1421, and will begin with electricity (charge, field, potential), capacitors and DC circuits. Magnetism and electromagnetic induction will then be discussed. The course concludes with light and physical optics. As in PHYS 1421, each topic builds upon the growing base formed by previously learned material.

## IV. Requirements Fulfilled

PHYS 1422 satisfies the second semester of the two-semester physics requirement for engineering students.

## V. Required Prerequisites

PHYS 1421: Physics I

MATH 1423: Calculus II

## VI. Learning Outcomes

- To achieve a foundation for continuing studies in physics concepts and practices.
- To understand the relationship of mathematical representations to their associated physical principles and concepts.
- To learn the basic principles of electricity, magnetism, light and modern physics, especially as they apply to engineering applications.
- To learn scientific skills, how to organize and analyze physical data, and then present logical, compelling scientific arguments based on these data.
- To understand the complementary nature of topics in physics, and how each new piece of information builds on a forming conceptual base.

## VII. Assessment Strategy

Assessment for this course will consist of a combination of examinations based on lecture materials, examinations based on laboratory materials, and grades provided on submitted written materials, primarily from the laboratory exercises. Specific assessment will include:

- A series of four written tests testing the detailed knowledge of short sections of the course (each exam worth 12.5% of the final grade for a total of 50%)
- A final, comprehensive written exam (25% of the final grade)
- Laboratory grade forming 25% of the course.

This science course will teach students how to work both individually and in a small team setting. The comprehensive exams will encourage students to integrate what they have learned from individual lectures or experiments into a more comprehensive understanding of the subject matter, and as such will begin at an early stage in the student's university education to build the skills and understanding that will be necessary for the capstone course in their discipline.

## VIII. Course Format

The course will consist of a combination of lecture presentations and a mandatory, separate laboratory class.

Attendance in both lecture and laboratory is mandatory. Lectures will consist primarily of presentation and discussion of material outlined below. Occasional films and Web-based presentations will be made. Laboratories will consist of an initial presentation/demonstration by the laboratory instructor, followed by laboratory exercises completed in small groups of two to three students. A key feature will be the creation of data, the analysis of that data, and the communication of the findings in the form of a series of written laboratory reports.

Web supplement: The course homepage (using suitable commercial Web tools) will include:

- Course syllabus
- Course assignments
- Keys to quizzes and exams
- Course e-mail utility
- Course discussion list
- Student course grades

**Classroom Hours** (6 hours per week) **Class:** 3
**Lab:** 3

## IX. Topics to Be Covered

A. Electric charge
B. Electric fields
   1. Coulomb's Law
   2. Point charges
   3. Dipoles
   4. Gauss' Law
C. Electric potential
D. Capacitors, DC circuits, RC circuits, Ampere's law
E. Magnetism
F. Electromagnetic induction, inductance, AC circuits, Maxwell equations
G. Light, images, interference, diffraction
H Geometrical and physical optics, lasers

## X. Laboratory Exercises

The laboratory component of this course will consist of a weekly series of three-hour laboratory exercises. The topics to be covered, in order, are:

A. Using a mulitimeter
B. Electric Fields and Electric Potential
C. Circuit and, wiring
D. Ohm's Law, resistivity, diodes

E. DC motors
F. Magnetism and induction
G. AC motors
H. Geometrical optics
I. Diffraction and interference
J. Images and lenses

## XI. Technology Component

A. In Class

Faculty and laboratory instructors will use state-of-the-art multi-media equipment to both project their materials and incorporate appropriate Web sites into their lectures in a real time basis. Laboratories will use computerized projection equipment and data recording and analyzing equipment, either as demonstrations or as part of small team laboratory exercises.

B. Outside of Class

Faculty will provide e-mail and/or Web site interaction regarding the course material, and will post materials on a dedicated course Web site. Students will be able to ask questions, observe and respond to the answers of other students, and independently follow up their studies by accessing appropriate Web sites from a provided list.

C. Web supplement

The course homepage on the University's BLACKBOARD system includes the following.

- Course syllabus
- Course assignments
- Course e-mail utility
- Course discussion list
- Student course grades

## XII. Special Projects/Activities

This course does not require a special project.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Tipler, Paul, and Gene Mosca, *Physics for Scientists and Engineers*, 6th Edition, W.H. Freeman, 2007.
ISBN: 0716789647

B. Alternative Textbooks

None

C. Supplemental Print Materials

Other supplemental print materials as provided by the publisher.

D. Supplemental Online Materials

1. Other supplemental online materials as provided by the publisher.
2. Instructors will develop a list of suitable, contemporary Web sites that are appropriate for the topics and level of detail that they will teach.

# D. COLLEGE CORE CURRICULUM

## Social and Behavioral Sciences

| | | |
|---|---|---|
| ECON | 1311: | Introduction to Macroeconomics |
| ECON | 1312: | Introduction to Microeconomics |
| GEGR | 1311: | World Regional Geography |
| HIST | 1311: | World Civilizations, 1600 – Present |
| PSYC | 1311: | Introduction to Psychology |
| FREN | 1311: | Introduction to French Language |
| SUST | 1311: | Introduction to Sustainability |
| PHED | 1111: | Active Living Lifestyle |
| PHED | 1112: | Healthy Behaviors and Management |

**Course Title: ECON 1311: Introduction to Macroeconomics**

**Semester Credit Hours: 3 (3, 0)**

### I. Course Overview

The course studies needs and resources; national income; money and banking; employment; fiscal and monetary policies; contemporary problems; economic growth, and international trade. ECON 1311 may be taken before or after ECON 1312, or only one of the courses may be taken.

### II. PMU Competencies and Learning Outcomes

It is imperative that students be aware of fundamental macroeconomic issues affecting business. Students will learn to express macroeconomic relationships and to predict consequences of changes in the relevant variables.

- Critical thinking and problem solving are developed as students analyze assigned questions, exercises, problems and cases.
- Oral, written and listening skills are developed as students are encouraged to participate in class, to do written homework assignments and to interact with other classmates.
- Teamwork is promoted as students are encouraged to work as part of a group in their case analysis.
- Modern information technology is utilized through the Internet as a learning resource and spreadsheets as tools in classroom preparation and homework assignments.

### III. Detailed Course Description

Macroeconomics focuses on economy-wide problems such as inflation, unemployment, and economic growth, including: forecasting business cycles, interest rates and exchange rates; causes of trade disequilibrium; consequences of fiscal unbalances; short- and long-term effects of monetary policy; and the globalization of financial markets. These topics are integrated into a theoretical framework that relies on international factors. Examples are used to enhance knowledge of the world economy and skills in solving practical problems. Lectures are complemented with group projects and interactive computer-based exercises.

### IV. Requirements Fulfilled

ECON 1311 satisfies three hours of the six-hour College Core Curriculum requirement in Social and Behavioral Sciences. Whether or not it is a required course is determined by each College's core

requirements.

## V. Required Prerequisites

N/A

## VI. Learning Outcomes

Students will be able

- Outline the role scarcity plays in defining economic choices and outline an understanding of Gross Domestic Product (GDP) and the fundamental macroeconomic problems of recession, economic growth, unemployment, inflation and international trade.
- Outline an understanding of employing the aggregate-demand and aggregate-supply model to analyze national economic conditions and macroeconomic policy options.
- Outline an understanding of the uses and limitations of fiscal and monetary policy as a tool for stabilizing and managing the economy and outline the functions of a nation's central bank.
- Develop problem solving abilities as students analyze assigned questions, exercises, problems, and cases.
- Develop oral, written, and listening skills as students participate in class discussion, engage in homework assignments, and interact with classmates.
- Demonstrate the ability to access, criticize and appraise real macroeconomic issues and problems pertaining to local and international cases.

## VII. Assessment Strategy

| | |
|---|---|
| Class Participation | 10% |
| Beginning Homework / Assignment | 5% |
| Exam 1 | 20% |
| Exam 2 | 20% |
| Term Project | 20% |
| Ending Homework / Assignment | 5% |
| Final Exam | 20% |

## VIII. Course Format

The course consists of lectures, individual assignments and group projects. Assignments are due approximately every second or third week. Students are expected to attend *all* classes, read the assigned material before class, and spend an *average* of two hours *per week* outside of class for every hour of lecture. These are *minimum* expectations.

## IX. Topics to Be Covered

A. INTRODUCTION TO MACROECONOMICS
   1. Short-run, long-run and their origins
   2. Economic growth
   3. Business cycles
   4. Economic data

B. ECONOMIC ISSUES
   1. The economic problem - scarcity
   2. Economic analysis tools
   3. Fundamental economic questions

C. THE OPEN ECONOMY
   1. Individual exchange

2. Absolute advantage
3. Comparative advantage
4. Benefits and costs of international trade

D. MEASURING ECONOMIC ACTIVITY
1. Economic flows and stocks
2. The circular flow
3. Basic economic identities for consumption and production

E. AGGREGATE SUPPLY AND AGGREGATE DEMAND
1. Aggregate supply
2. Aggregate demand
3. Long run and short run
4. Equilibrium

F. EXPENDITURES MULTIPLIERS
1. Consumption and saving with fixed prices
2. Aggregate planned expenditures
3. The multiplier process
4. Multiplier and prices

G. GOVERNMENT BUDGET
1. Revenues and expenditures
2. Surpluses and deficits
3. Debt financing mechanisms
4. National and global impact

H. MONEY MARKET
1. Nature and concept
2. Money supply
3. Money demand
4. Inflation
5. Financial intermediaries

I. LABOR MARKET
1. Nature and concept
2. Inflation and unemployment
3. Demand pull
4. Cost push

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have an electronic account on the University's BLACKBOARD system to communicate via e-mail. Students are also expected to check their BLACKBOARD account regularly to keep up-to-date with announcements, supplemental material, assignments and calendar entries. In addition, students should be familiar with the use of the internet.

## XII. Special Projects/Activities

None

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Parkin, Michael, *Economics*, 12th Edition, Prentice Hall, 2016.
ISBN-13: 978-1-292-09450-2
ISBN-10: 1-292-09450-8

B. Alternative Textbooks
Mankiw, N. Gregory, *Principles of Macroeconomics*," 6th Edition, Thomson South-Western, 2011.

C. Supplemental Print Materials
None

D. Supplemental Online Materials
1. Macroeconomic data http://people.stern.nyu.edu/nroubini/WEBLINKS.HTM
2. Economic glossary http://pages.stern.nyu.edu/~nroubini/bci/bci.html
3. Recent Macroeconomic Controversies and Policy Debates http://pages.stern.nyu.edu/~nroubini/POLICY.HTM
4. European Monetary Union and the Euro http://pages.stern.nyu.edu/~nroubini/Emu/Emu.htm

**Course Title: ECON 1312: Introduction to Microeconomics**

**Semester Credit Hours: 3 (3, 0)**

## I. Course Overview

The course studies opportunity costs, resource allocation, consumer and producer behavior, production, costs, markets, market structures, and the role of government in a market economy. ECON 1312 may be taken before or after ECON 1311, or only one of the courses may be taken.

## II. PMU Competencies and Learning Outcomes

It is imperative that students are familiar with microeconomic tools for market analysis. Students are provided with a logical framework for critical thinking and problem solving by introducing students to the fundamental concepts and tools used to enhance decision-making.

- Critical thinking and problem solving are developed as students analyze assigned questions, exercises, problems and cases.
- Oral, written and listening skills are developed as students are encouraged to participate in class, to do written homework assignments and to interact with other classmates.
- Teamwork is promoted as students are encouraged to work as part of a group in their case analysis.
- Modern information technology is utilized through the Internet as a learning resource and spreadsheets as tools in classroom preparation and homework assignments.

## III. Detailed Course Description

Microeconomics focuses on smaller scale economic problems faced by consumers, producers, firms, and governments. Microeconomics analyzes the behavior of markets for particular goods and services. Its focus is on one market at a time. In order to analyze markets, the behavior of both buyers and sellers are examined. The theory of consumer decision making, production costs, and decisions concerning how much to consume and produce are studied. The course focuses on three basic types of economic questions: (1) What types of goods should be produced? (2) In what proportions should the goods be produced? And (3) to whom should the goods be distributed? The goal is to be able to think systematically and clearly about the various kinds of market structures and to understand some of their strengths and limitations.

## IV. Requirements Fulfilled

ECON 1312 satisfies three hours of the six-hour College Core Curriculum requirement in Social and Behavioral Sciences. Whether or not it is a required course is determined by each college's core requirements.

## V. Required Prerequisites

N/A

## VI. Learning Outcomes

- Outline the role scarcity plays in defining economic choices and the meaning of market demand and supply, equilibrium and elasticity.
- Outline an understanding of how consumers maximize their utility, the production function, the law of diminishing returns, and how the various measures of cost are related.
- Outline an understanding of the market characteristics of perfect competition, monopoly, oligopoly and monopolistic competition and how the markets differ in terms of profits, pricing, and how they affect consumers.
- Develop problem solving abilities as students analyze assigned questions, exercises, problems, and cases.
- Develop oral, written, and listening skills as students participate in class discussion, engage in homework assignments, and interact with classmates.
- Demonstrate the ability to access, criticize and appraise real microeconomic issues and problems pertaining to local and international cases.

## VII. Assessment Strategy

| | |
|---|---|
| Class Participation | 10% |
| Beginning Homework / Assignment | 5% |
| Exam 1 | 20% |
| Exam 2 | 20% |
| Term Project | 20% |
| Ending Homework / Assignment | 5% |
| Final Exam | 20% |

## VIII. Course Format

The course consists of lectures, individual assignments and group projects. Assignments are due approximately every second or third week. Students are expected to attend *all* classes, read the assigned material before class, and spend an *average* of two hours *per week* outside of class for every hour of lecture. These are *minimum* expectations.

## IX. Topics to Be Covered

A. Introduction to microeconomics
   1. Economic theory
   2. Functional relationships
   3. Marginal analysis
   4. Equilibrium
   5. Scarcity
   6. Opportunity costs

B. Consumer's choices
   1. Utility analysis
   2. Behavioral predictions
   3. Consumer demand

C. Demand, supply, and elasticity
   1. Market demand curve
   2. Price elasticity of demand
   3. Cross-price elasticity of demand
   4. Income elasticity of demand

5. Price elasticity of supply

D. Production and Cost
   1. Production
   2. Short-run cost of production
   3. Long-run cost of production
   4. Producer supply

E. Market structure
   1. Perfect competition
   2. Monopoly
   3. Monopolistic competition
   4. Oligopoly
   5. Externalities
   6. Public goods and renewable resources

F. Factor markets, inequality, and uncertainty
   1. Market for production factors
   2. Economic inequality
   3. Uncertainty and information

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have an electronic account on the University's BLACKBOARD system to communicate via e-mail. Students are also expected to check their BLACKBOARD account regularly to keep up-to-date with announcements, supplemental material, assignments and calendar entries. In addition, students should be familiar with the use of the internet.

## XII. Special Projects/Activities

None

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Parkin, Michael, *Economics,* 12th Global Edition, Pearson, 2016.
ISBN-13: 978-1-292-09450-2
ISBN-10: 1-292-09450-8

B. Alternative Textbook

Mankiw, N. Gregory, *Principles of Microeconomics*," 6th Edition, Thomson South-Western, 2011.

C. Supplemental Print Materials

Backhouse, Roger, *The Penguin History of Economics*, Penguin Books, 2002
ISBN-13: 9780140260427.
Heilbroner, L. Robert, *The Worldly Philosophers: The Lives, Times And Ideas Of The Great economic Thinkers*, 7th Edition, Touchstone, 1999.
ISBN: 0-684-86214-x

D. Supplemental Online Materials

None

**COURSE TITLE: GEGR 1311: World Regional Geography**

**Semester Credit Hours: 3 (3, 0)**

## I. Course Overview

The course is primarily a survey of physical and cultural patterns of the world. It presents a broad overview of geographical concepts such as landforms, climate, language, economies, and political structures. The course involves extensive use and interpretation of maps and graphs within a geographic context. It also examines the process and consequences of globalization made possible by modern communication technology.

## II. PMU Competencies and Learning Outcomes

Geography requires analytical thinking, not just memorization. The course provides a logical framework for critical thinking and problem solving by introducing students to the fundamental concepts and tools used to enhance decision-making. Students will learn to recognize the importance of specific concepts and how they fit together. The student will be able understand the consequences of changes in relevant variables. Course exercises will require students to work as a team to analyze a problem, write and orally present a report. Students will work in groups on projects and assignments and use the Internet to retrieve relevant information and data needed to address the projects and assignments. Several exercises involve map work and Internet research will be required. This course supports the PMU competency of "Globally Connected" as it covers the widely varying nature of all parts of Planet Earth.

## III. Detailed Course Description

An increasingly interconnected world means that knowledge about places beyond one's own country is essential for those who wish to work in a national or global theater. This knowledge is often important also for understanding one's immediate surroundings. GEGR 1311 is intended to introduce students to the people, places, and problems of the world's regions. The course emphasizes environmental geography, population and settlement, cultural coherence and diversity, geopolitics, and economic and social development. Lectures are complemented with group projects and interactive computer-based exercises.

## IV. Requirements Fulfilled

GEGR 1311 satisfies three hours of the six-hour College Core Curriculum requirement in Social and Behavioral Sciences. Whether or not it is a required course is determined by each college's core requirements.

## V. Required Prerequisites

This course does not have a prerequisite.

## VI. Learning Outcomes

Student will be able to:

- Use the basic terminology, concepts, and analytic models of geography.
- Demonstrate knowledge of the importance of maps, map projections, map scale, the design of maps.

- Identify and analyze critically current world problems such as population increase, food and water supply, environmental pollution, cultural and political conflict and urbanism.
- Demonstrate the ability of using geographical knowledge and critical thinking skills to understand the importance of globalization and global connectivity.
- Communicate geographical concepts, themes and data effectively using a multi-media presentation.

## VII. Assessment Strategy

All of these assessment strategies will be linked to strategies used in the PMU Assessment Capstone Series.

| | Assessment Task | Weight |
|---|---|---|
| 1 | Assignment 1 written (individual) | 10% |
| 2 | Assignment 2 written (individual) | 15% |
| 3 | Assignment 3 written (collaborative) | 15% |
| 4 | Assignment 4 presentation | 15% |
| 5 | Participation/attendance | 10% |
| 6 | Midterm examination | 15% |
| 7 | Final examination | 20% |
| **Total** | | **100%** |

## VIII. Course Format

Students are expected to attend all classes, read the assigned material before class, and spend an average of two hours per week outside of class for every hour of lecture. These are minimum expectations. The class consists of lectures, group assignments and projects. Assignments alternate among lectures, group assignments and projects. Assignments and projects will involve a combination of group and individual work.

A list of the number of hours for each type of instruction follows:

**Classroom Hours** (3 hours per week) **Class:** 3

**Lab:** 0

## IX. Topics to be Covered

A. Introduction to Geography
   1. Basic principles of physical geography
   2. Basic principles of human geography.
   3. Geographic techniques
   4. Geographic themes—regions, …. add more
   5. Maps
   6. Globalization
   7. Population and settlement and environmental impact
   8. Urbanization
   9. Cultural coherence and diversity
   10. Geopolitical framework
   11. Cooperation
   12. Economic and social development

13. Economic development
14. Unevenness of economic development
15. Indicators of economic and social development

B. Landforms, Climate, and Vegetation

C. North America
   1. Landform regions
   2. Climates and vegetation
   3. Environmental modification and problems
   4. Population and settlement
   5. Cultural coherence and diversity
   6. Geopolitical framework
   7. Borders
   8. Economic and social development

D. Latin America and the Caribbean
   1. Environmental geography
   2. Climate
   3. Environmental degradation
   4. Population and settlement
   5. Cultural coherence and diversity
   6. Geopolitical framework
   7. Commercial development
   8. Economic and social development
   9. Colonialism/post-colonialism

E. Sub-Saharan Africa
   1. Environmental geography
   2. Population and settlement
   3. Cultural coherence and diversity
   4. Geopolitical framework
   5. Economic and social development

F. Southwest Asia and North Africa
   1. Environmental geography
   2. Population and settlement
   3. Cultural coherence and diversity
   4. Geopolitical framework
   5. Economic and social development

G. Europe
   1. Environmental geography
   2. Population and settlement
   3. Cultural coherence and diversity
   4. Geopolitical framework
   5. Economic and social development

H. Russia and its neighbors
   1. Environmental geography
   2. Population and settlement
   3. Cultural coherence and diversity
   4. Geopolitical framework

5. Economic and social development

I. Central Asia
   1. Environmental geography
   2. Population and settlement
   3. Cultural coherence and diversity
   4. Geopolitical framework
   5. Economic and social development

J. South Asia
   1. Environmental geography
   2. Population and settlement
   3. Cultural coherence and diversity
   4. Geopolitical framework
   5. Economic and social development

K. Australia, New Zealand, and the South Pacific

L. Economic integration
   1. Common market: Expansion of economic alliance
   2. Transition and turmoil in Eastern Europe
   3. Adjustment in post-Soviet Era: Loss of markets, privatization, increased connection to west
   4. Emergence of regional disparities
   5. Attributes of areas where progress is greatest

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have a computer account on the BLACKBOARD or some other server to communicate via e-mail. Students should immediately sign up for the online discussion group for the class. Students are also expected to become familiar with the use of the Internet.

All assignments and projects are submitted online. Assignments focus on guided collaborative learning, media-assisted instruction, research projects, and laboratory and computer exercises. Students should check with their instructor in order to obtain the specific methods to be used in the course.

Office hours are available via audio and video for discussion of class materials. Even without a video camera, students can use the audio on their computers to discuss class issues.

## XII. Special Projects/Activities

A. Assignment 1

Present an analysis and PowerPoint presentation, including maps, of Middle East geographical features to a history class. The presentation should include both specific and general information and be presented in an informative manner that might include maps, charts, short video, and visual aids. Generally, a presentation of this type might be from 30-45 minutes in length. Class members should receive a typed list of important facts concerning the topic. This list is to have between 20-30 facts. Information learned from this will be included on the final exam. Be creative and interesting. Include in the analysis the following items:

- Landscape and climate

- Economic and cultural patterns
- Influences of the past
- Major nations
- Outlook for the future

B. Assignment 2

Make an inventory of the student's possessions. Categorize them into the categories, such as clothing, electronics, and accessories, furniture, and jewelry. Map the places where the student's possessions were made. Develop a report on what the student found out about the origin of the things the student's possessions. Were they made in one part of the world? Where? What does the student's list say about a global economy? The presentation should include both specific and general information and be presented in an informative manner that might include maps, charts, short video, and visual aids. Generally, a presentation of this type might be from 20-30 minutes in length. Class members should receive a typed list of important facts concerning the topic. Information learned from this will be included on the final exam. Be creative and interesting.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Marston, Sallie A., Paul L. Knox, Diana M. Liverman, and Vincent L Del Casino, *World Regions in Global Context: People, Places, and Environments,* 6th Edition, Pearson 2016.

B. Alternative Textbooks

None

C. Supplemental Print Materials

None

D. Supplemental Online Materials

1. GIS and Cartography Data
   http://www.ccdmd.qc.ca/en/gis/

**COURSE TITLE: HIST 1311: World Civilizations 1500 - Present**

**Semester Credit Hours: 3 (3, 0)**

## I. Course Overview

This course is a survey of the development of the major civilizations of the world from 1500 to the present. HIST 1311 stresses the dynamic nature and expansion of the West, the interpenetration of cultures in the modern era, and the resurgence of non-Western independence in the 20th century.

## II. PMU Competencies and Learning Outcomes

The study of history requires analytical thinking. The course provides a logical framework for critical thinking and problem solving by introducing students to the historical concepts and understanding needed to develop global awareness. Students will learn to recognize the importance of specific concepts and how they fit together. Through critical reading and listening, students will be able to extrapolate from history interrelated concepts that will allow them to comprehend the causes and consequences of change. Course exercises will require students to work as a team to analyze a problem. Students will work in groups on projects and assignments and use the Internet to retrieve relevant information and data needed to address the projects and assignments. This course support supports the two PMU competencies of "Globally Connected and Conflict Resolution". It will expose students to cultures that are both familiar and unfamiliar to them. In examining the cultures of the world, students and the instructor will have ample opportunities to discuss conflicts between these cultures, what the results of the conflicts were and what might have been done to avoid conflict.

## III. Detailed Course Description

This course serves as an introduction to world history from 1500 to present. It examines the path from "then" to "now" not as a sequence of facts and details, but rather, a series of interrelated cultures and societies. This course promotes critical thinking about the major themes across this time frame such as industrialization, imperialism, and globalization and provides the tools to understand the underlying internal and external factors driving those trends. The course also serves to compare the experiences of people and civilizations with one another across time.

## IV. Requirements Fulfilled

HIST 1311 satisfies three hours of the six-hour College Core Curriculum requirement in Social and Behavioral Sciences. Whether or not it is a required course is determined by each college's core requirements.

## V. Required Prerequisites

This course does not have a prerequisite.

## VI. Learning Outcomes

The course will help students recognize not only each civilization's distinctive features, but also their commonalities and interconnections, and ways in which those commonalities and interconnections have changed over time.

Students will be able to:

- Demonstrate knowledge of the basic terminology, concepts, and analytic models of the profession of a historian.

- Compare the experiences of people and civilizations with one another across time and understand the importance of globalization and global connectivity in the context of these experiences.
- Demonstrate the application of analytical and critical thinking skills conducting historical research and present their findings in a research paper.
- Analyze how to use historical concepts to grasp human behavior and understand how conflicts between cultures or nations arise and how they can be solved.
- Present through the usage of a technology an important historical event (1500 – present).

## VII. Assessment Strategy

**Summary of assessment**

| | Assessment Task | Weight |
|---|---|---|
| 1 | Introductory Group Project | 15% |
| 2 | Proposal of Research paper | 10% |
| 3 | Complete Research Paper | 20% |
| 4 | Presentation of Research Paper | 15% |
| 5 | Final Exam | 15% |
| 6 | Mid Term Exam | 15% |
| 7 | Class attendance and participation | 10% |
| **Total** | | **100%** |

## VIII. Course Format

Students are expected to attend all classes, read the assigned material before class, and spend an average of two hours per week outside of class for every hour of lecture. These are minimum expectations. The class consists of lectures, group assignments and projects. Assignments alternate among lectures, group assignments and projects. Assignments are due approximately every second or third week.

**Classroom Hours** (3 hours per week) **Class:** 3
**Lab:** 0

## IX. Topics to be Covered

A. The World from 1500 to 1900.
B. "Internationalism, 1900-1939."
C. Science and Technology, 1919-1945.
D. Economic Consequences of War and Peace, 1919-1945
E. Bi-polar world, 1945-1953
F. Perpetual crisis, 1950-1964
G. Border crossings, 1946-1975
H. Breakdown of the bipolar world, 1969-1981
I. Reconfigurations of power, 1981-1991
J. Global society in the new millennium

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have a computer account on the University's BLACKBOARD system to communicate via e-mail. Students are expected to become familiar with the use of the Internet.

All assignments and projects are submitted online. Assignments focus on guided collaborative learning, media-assisted instruction, research projects, and laboratory and computer exercises. Students should check with their instructor in order to obtain the specific methods to be used in the course.

## XII. Special Projects/Activities

None.

## XIII. Textbooks and Teaching Aids

A. Required Textbook

Richard W. Bulliet et al. *The Earth and its Peoples: A Global History* (7th edition). Boston: Cengage, 2019.

B. Alternative Textbooks

Craig, Albert M. et. al., *The Heritage of World Civilizations*, Vol. 2, 9th edition, New York: Prentice Hall, 2011.

C. Supplemental Print Materials

None

E. Supplemental Online Materials

1. East Asian history resource "Asia for Educators"
   http://afe.easia.columbia.edu
2. The Asia for Educators website
   http://afe.easia.columbia.edu
3. The Avalon Project
   http://avalon.law.yale.edu/default.asp
4. The Cold War International History Project
   https://www.wilsoncenter.org/program/cold-war-international-history-project
5. The Wilson Center Digital Archive
   http://digitalarchive.wilsoncenter.org
6. Documents in World History
   http://www2.uncp.edu/home/rwb/World_History_Documents.pdf
7. Visual Sourcebook for Chinese Civilization
   http://depts.washington.edu/chinaciv/
8. General History Resource
   http://uweb.cas.usf.edu/ssphs/genhist.html
9. Global History Sourcebook
   http://www.fordham.edu/halsall/global/globalsbook.html
10. Islamic History Sourcebook
    http://www.fordham.edu/halsall/islam/islamsbook.html
11. 20th Century
    http://www.fsmitha.com/h2/index.html

12. Historical Documents

http://www.edteck.com/dbq/basic/world_%20links.htm
http://www.bbc.co.uk/programmes/p00548jd#broadcasts
http://www.bbc.co.uk/programmes/b00sl6jb
http://www.bbc.co.uk/ahistoryoftheworld/objects/TqaoVXmFRAepy6jBV2Figw
http://www.bbc.co.uk/programmes/b00v72x8
http://www.bbc.co.uk/ahistoryoftheworld/about/british-museum-objects/

**COURSE TITLE: PSYC 1311: Introduction to Psychology**

**Semester Credit Hours: 3 (3,0)**

## I. Course Overview

This course is an introduction to fundamentals of psychology including an overview of the concepts and methods of such areas as perception, learning, motivation, memory, development, personality, abnormal, and social psychology.

## II. PMU Competencies and Learning Outcomes

The study of psychology requires analytical thinking. The course provides a logical framework for critical thinking and problem solving by introducing students to psychological concepts and understanding required to develop individual awareness. Students will learn to recognize the importance of specific concepts and how they fit together. Through critical reading and listening, the student will be able to determine from those interrelated concepts and comprehend the causes and consequences of individual change. Course exercises will require students to work as a team to analyze a problem, write and orally present a report. Students will work in groups on projects and assignments and use the Internet to retrieve relevant information and data needed to address the projects and assignments.

## III. Detailed Course Description

This course is a broad introduction to psychology, including the basic subject matter, the approaches to gathering and evaluating information and the methods that psychological knowledge is applied to the understanding and improvement of individual and community life. Topics covered include behavior, cognition, emotions, sensation and perception, intelligence and memory. It also covers areas including social psychology, stress and health, abnormal psychology, and the treatment of psychological disorders.

## IV. Requirements Fulfilled

PSYC 1311 satisfies three hours of the six-hour College Core Curriculum requirement in Social and Behavioral Sciences. Whether or not it is a required course is determined by each college's core requirements.

## V. Required Prerequisites

This course does not have a prerequisite.

## VI. Learning Outcomes

Psychology by definition is designed to help the student in understand other people as well as to understand himself or herself. As such, it supports the PMU competency by providing students with insight into empathy and other tools necessary to avoid conflict.

Students will be able to:

- Define and describe psychology, the scientific method and the terminology used in the field of psychological research.
- Define specific psychological disorders, recognize their main symptoms and explain causes.
- Analyze how the study of psychology is relevant in various aspects of life.
- Evaluate ethical considerations regarding research on humans.
- Demonstrate the ability to formulate a hypothesis that can be empirically tested and present it to an audience with the support of technology.

## VII. Assessment Strategies

| | Assessment Task | Weight |
|---|---|---|
| 1 | Assignment 1 Dream Log (Individual Written Report) | 5% |
| 2 | Assignment 2 Developmental Differences across the Lifespan (Project and Group PowerPoint Presentation ) | 15% |
| 3 | Assignment 3 Psychological disorders (Group PowerPoint Presentation ) or Web Quest | 10% |
| 4 | Assignment 4 Analyzing my Personality (Individual Written Report) | 10% |
| 5 | Assignment 5 Research Project | 20% |
| 6 | Midterm exam | 15% |
| 7 | Final term exam | 15% |
| 8 | Attendance and Participation | 10% |
| | **Total** | **100%** |

## VIII. Course format

Students are expected to attend all classes, read the assigned material before class, and spend an average of two hours per week outside of class for every hour of lecture. These are minimum expectations. The class consists of lectures, group assignments and projects. Assignments alternate among lectures, group assignments and projects, and online discussions. Assignments are due approximately every second or third week.

A list of the number of hours for each type of instruction follows:

**Classroom Hours** (3 hours per week) **Class:** 3

**Lab:** 0

## IX. Topics to be Covered

1. Mind, Behavior, and Psychological Science
2. Biopsychology, Neuroscience, and Human Nature
3. Sensation and Perception
4. Learning and Human Nature
5. Memory
6. Thinking and Human Intelligence
7. Development over the Lifespan
8. States of Consciousness
9. Motivation and Emotion
10. Personality Theories of the Whole Person
11. Social Psychology
12. Psychological Disorders
13. Therapies for Psychological Disorders
14. Stress, Health, and Well-Being

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have a computer account on the BLACKBOARD or some other server to communicate via e-mail. Students are also expected to become familiar with the use of the Internet.

All assignments and projects are submitted online. Assignments focus on guided collaborative learning, media-assisted instruction, research projects, and laboratory and computer exercises. Students should check with their instructor in order to obtain the specific methods to be used in the course.

## XII. Special Projects

The following two group assignments are required to complete the course.

A. Assignment 1

Students must understand developmental differences across the lifespan. Students must prepare a project that will give them an opportunity to apply information literacy skills. Based on research in scholarly journals, a report that compares one aspect of development in three different stages of the lifespan has to be developed. The project must include a developmental concept (e.g. friendship, attachment, nutrition, exercise, memory, cognition, social interaction, family violence, moral development, sibling relationships, grief, bereavement, birth order, or the impact of war, disaster, violence, or poverty) and stages of development.

The presentation should include both specific and general information and be presented in an informative manner that might include maps, charts, short video, and visual aids. Class members will receive a typed list of important facts concerning the topic. Information learned from this will be included on the final exam. Be creative and interesting.

B. Assignment 2

Students will identify a topic of interest, and summarize and integrate recent articles from the primary research literature. The topic of interest will be reduced to a meaningful question or hypothesis that can be empirically tested. Then, students will design an appropriate experiment for evaluating the hypothesis and statistically analyze and interpret data that are based on the design. The presentation should include both specific and general information and be presented in an informative manner that might include maps, charts, short video, and visual aids. Generally, a presentation of this type might be from 30-45 minutes in length. Class members should receive a typed list of important facts concerning the topic. Information learned from this will be included on the final exam. Be creative and interesting.

## XIII. Textbooks and Teaching aids

A. Required Textbook

Zimbardo, Philip, Robert L. Johnson, and Vivian McCann Hamilton, *Psychology: Core Concepts*, 7th Edition, Pearson, 2012.

B. Alternative Textbooks

None

**Course Title: FREN 1311: Introduction to French Language**

**Semester Credit Hours: 3 (3, 0)**

## I. Course Overview

This course introduces students to the pronunciation, basic comprehension, and communication of French language through active class use of simple vocabulary, grammar, and syntax. It stresses oral proficiency, pronunciation, listening comprehension and grammatical accuracy. In addition, the students will acquire an initial understanding of cultural backgrounds of French-speaking countries.

## II. PMU Competencies and Learning Outcomes

This course supports the PMU competency of "Globally Connected" as it provides an opportunity to learn one more international language that will facilitate the students' ability to interact and communicate with more than 220 million speakers and 72 million partial speakers of French worldwide.

The four basic skills of language, speaking, listening, writing, and reading will be developed. The course will serve as an introduction to the French language to our students. In addition, students will be exposed to some aspects of the French culture.

## III. Detailed Course Description

FREN 1311 is an introduction to acquiring oral skills in French. The principal aim of the course is to develop basic oral communication. In addition, the course will focus in the development of oral comprehension. The writing and reading skills will also be included. By the end of the course, students will be able to ask and answer a variety of questions using grammatically correct sentences. Culture will also be an essential component of this course, and it will incorporate culture into the teaching by practicing some of the French traditions during the lessons

## IV. Requirements Fulfilled

FREN 1311 satisfies three hours of Core Curriculum requirement in Humanities, Social and Behavioral Sciences. Whether or not it is a required course is determined by each college's core requirements.

## V. Required Prerequisites:

None

## VI. Learning Outcomes:

Students will be able to:

- Pronounce French with an understandable, near-native French accent.
- Listen and speak conversations in French by using learned patterns.
- Write basic sentences and short paragraphs in French using materials studied during the semester.
- Show comprehension of reading passages by responding to content specific questions.
- Demonstrate proficiency in the present, past tenses and imperfect in French.
- Demonstrate the knowledge of vocabulary to engage in simple conversation about daily activities

## VII. Assessment Strategy:

Students will be evaluated by their reading comprehension, grammar and sentence construction, listening, speaking, writing and class participation. Active listening is central to every communication course, these skills will be evaluated through tests based on participation in class

drills, listening to stories read in class, class discussions, and oral communication with instructor and classmates. Oral work (speaking) will be evaluated on the basis of competence in pronunciation and proficiency in structured and unstructured situations. Structured situations include oral responses to textbook exercises, class drills involving individual responses and four prepared oral presentations with spontaneous interaction with classmates in follow-up discussion of each personal presentation and of those of their classmates. Unstructured situations include impromptu questioning in class, interaction with classmates and instructor on specified topics, including group practice and free discussion of French texts. Students usually participate in an oral exam on the last day of the term. Reading will be evaluated through comprehension of paragraphs written in French with follow-up questions. Writing of French original phrases, grammatical exercises, sentence structures and vocabulary to organize and express thoughts in daily homework entries, original short essays, quizzes, and exams, will determine students' progress in writing. In total, students will write four short original essays practicing specific grammatical structures. Class participation will be evaluated on the frequency of the student's voluntary response in class and the quality of oral and written preparation of assigned class exercises. Homework is evaluated by the accuracy, timeliness and completeness of submitted homework units.

| | Assessment Task | Weight |
|---|---|---|
| 1 | Quizzes | 15% |
| 2 | Homework | 15% |
| 3 | Chapter Tests | 15% |
| 4 | Mid-Term Exam | 15% |
| 5 | Presentation | 10% |
| 6 | Final Exam | 15% |
| 7 | Attendance, Preparation & Active Class Participation | 15% |
| | **Total** | **100%** |

## VIII. Course Format:

Students will attend three-one-hour lecture/discussion sessions per week. The course homepage (using BLACKBOARD) contains the following:

- Course syllabus
- Course assignments
- Course calendar
- Course e-mail utility
- Course discussion list

**Classroom Hours** (3 hours per week) **Class**: 3
**Lab:** 0

## IX. Topics to be Covered

These topics are covered during instructor lectures, homework assignments, choral drill and interactive work with the instructor and classmates in the classroom (pair work), work with the audio files in the language lab and at home, and work with video files in the Language Lab.

- Greetings
- Introduce yourself in French
- Pronunciation
- Nouns – gender, number
- Articles
- Pronouns
- Verb ÊTRE, AVOIR
- Adjectives

- Numbers
- Telling time
- Negation
- Question sentences
- Possessive adjectives
- Verb AIMER + infinitive
- Verb VENIR
- Contractions of **de**
- Verb FAIRE
- Reflexive verbs
- Verb ALLER
- Subject pronoun **on**
- Verbs POUVOIR, VOULOIR, SAVOIR
- Prepositions of location
- Interrogative words
- Verb PRENDRE
- Il faut and verb DEVOIR
- Demonstrative adjectives
- Partitive articles
- Verbs COURIR, SORTIR, DORMIR
- Placement of adjectives
- Verbs ending with –IR
- Verb ending with -RE and METTRE
- Direct object pronouns
- Indirect object pronouns
- Verb CONNAÎTRE
- Expressions with AVOIR
- Passé composé with AVOIR
- Passé composé with ÊTRE
- Passé compose of reflexive verbs
- Negative expressions
- Verbs VOIR, CROIRE
- Verbs DIRE, LIRE, ÉCRIRE
- Imparfait
- Passé compose vs. Imparfait

Cultural Contexts:

- Geography of the French-speaking world
- Levels of formality
- The café
- Monetary systems
- Global importance of the French language
- French cultural icons

**X. Laboratory Exercises:**

Language Lab TBD

**XI. Technology Component:**

Technology will be an integral part of the course as students use word processing, e-mail, and as the University's BLACKBOARD system to research, write, peer review, revise, and submit their paper.

**XII. Special Projects/Activities**

**TBD**

## XIII. Textbooks and Teaching Aids

Parmentier, Michel A., and Diane Potvin. En bons termes. 9th ed.

Toronto: Pearson, 2014.

Parmentier, Michel A., Diane Potvin, and Andrée Potvin. En bons

termes : Cahier de laboratoire. 9th ed. Toronto: Pearson, 2014.

Alternative Textbooks

Capretz, Pierre J., Béatrice Abetti, Marie-Odile Germain, and Laurence Wylie. *French in Action: The Capretz Method Part 1*. 2nd ed. New Haven and London: Yale University Press, 1997.

Parmentier, Michel A., and Diane Potvin. *En bons termes*. 7th ed. Toronto: Prentice-Hall Canada, 2007.

Parmentier, Michel A., Diane Potvin, and A. Mister. *En bons termes: Cahier de laboratoire*. 7th ed. Toronto: Prentice-Hall Canada, 2007.

Bragger, Jeannette D. and Rice, Donald, B. (2000). *Allons-y*, 5th edition, Heinle & Heinle.

C. Supplemental Print Materials

Students are encouraged to invest in a French-English, English-French dictionary, although these are available in the library and in the Language Lab.

D. Supplemental Online Materials

https://www.livelingua.com/
http://www.learnalanguage.com/
http://www.openculture.com/freelanguagelessons
http://www.surfacelanguages.com/
https://www.internetpolyglot.com/
http://hs2.dliflc.edu/
https://streema.com/tv/
https://www.fluentu.com/

**Course Title: SUST 1311: Introduction to Sustainability**

**Semester Credit Hours: 3 (3, 0)**

## I. Course Overview

This course is an introduction to fundamental of sustainability including an overview of the concepts of such area to develop student's understanding of the interconnectedness of human and natural systems. SUST 1311 provides students the ability to freely explore how sustainability ideas can supplement existing values. It also provides the students the skills to develop a scientific and social literacy, information management, interpersonal expression, critical thinking and the skills for identifying and solving problems objectively.

## II. PMU Competencies & Learning Outcomes

The study of sustainability requires analytical thinking. The course provides a logical framework for critical thinking and problem solving by introducing students to different aspects and concepts of sustainability and understanding required to develop individual awareness. Students will learn to recognize the importance of specific concepts and how they fit together. Through critical reading and listening, the student will be able to identify the key characteristics of human and natural systems as they pertain to sustainability and, identify measurable collective and individual actions, and analyze sustainability from a multidisciplinary perspective and understand main doctrines of diversity.

## III. Detailed Course Description

This course familiarizes students to the theory, principles, and practices of sustainability. It will include discussions on sustaining ecological and environmental wellbeing, creating economic prosperity, and safeguarding social justice.

## IV. Requirements Fulfilled

SUST 1311 satisfies three hours of the Social Science Elective of College Core Curriculum requirement

## V. Required Prerequisites

This course does not have a prerequisite

## VI. Learning Outcomes

Students will be able

- Define and understand the concept of sustainability.
- Identify the key characteristics of human and natural systems as they pertain to sustainability.
- Communicate how the key characteristics of human and natural systems interact with one another.
- Identify measurable collective and individual actions.
- Analyze sustainability from a multidisciplinary perspective and understand main doctrines of diversity.

## VII. Assessment Strategy

| | Assessment Task | Weight |
|---|---|---|
| 1 | Quizzes | 10% |
| 2 | Assignments | 20% |

| | | |
|---|---|---|
| 3 | Mid-Term Exam 1 | 20% |
| 4 | Mid-Term Exam 2 | 20% |
| 6 | Final Exam | 30% |
| | **Total** | **100%** |

## VIII. Course Format

Students will attend three one-hour lecture/discussion sessions per week.

The course homepage on the University's BLACKBOARD system should contain the following:

- Course syllabus
- Course assignments
- Course calendar
- Course e-mail utility
- Course discussion list
- Peer review utility

**Classroom Hours** (3 hours per week) **Class:** 3

**Lab: 0**

## IX. Topics to Be Covered

A. An introduction to the concept of sustainability (its roots, and history of development) and global Sustainable Development Goals (SDGs).
B. Understanding the natural systems, the water cycle, the nutrient cycle…
C. Detailed look at the indicators of Human Fingerprint on the Earth and how human activity can affect the climate change.
D. The reasons and consequences of pollution and the different technologies for treatment of waste water and solid waste.
E. Sustainable food, agriculture and water security
F. Analysis of the sustainability problems caused by transportation and the strategies to achieve sustainable transport
G. Introduction to the Renewable Energy sources. The advantages and the problems of using Renewable Energy
H. Identification of the available tools for sustainability assessment which is the key element for advancing sustainable development
I. Description of the elements of green building standards and models and an explanation how each reduces resources uses
J. The tools that we can use to attain sustainability such as policy, law, communication, marketing, research advocacy, and international treaties.
K. A summary about the recent actions that have been taken to achieve sustainable development and the perspectives

## X. Laboratory Exercises

This course does not require a separate lab.

## XI. Technology Component

Students are expected to have a computer account on the University's BLACKBOARD system to communicate. Students should immediately sign up for the online discussion group for the class. Students are also expected to become familiar with the use of the Internet & library resources. All assignments and projects are submitted online. Assignments focus on guided collaborative learning, media-assisted instruction, research projects, and laboratory and computer exercises. Students should check with their instructor in order to obtain the specific methods to be used in the course.

**XII. Special Projects/ Activities**

TBD

**XIII. Textbooks and Teaching Aids**

A. Required Textbook

Robert Brinkmann, *Introduction to Sustainability*, 1st edition, Wiley-Blackwell, 2016,

ISBN-13: 978-1118487259

ISBN-10: 1118487257

B. Alternative Textbook

Margaret Robertson, *Sustainability Principles and Practice*, 2nd edition, Routledge, 2017,

ISBN-10: 9781138650244

ISBN-13: 978-1138650244

C. Supplemental Print Materials

None

D. Supplemental online Materials

www.chemistryworld.com/sustainability

**Course Title: PHED 1111: Active Living Lifestyle**

**Semester Credit Hours: 1 (1,0)**

**I. Course Overview**

Physical Education I Core course begins with an overview of the difference between health, wellness, and fitness providing practical strategies for developing and maintaining a healthy lifestyle. Students, through lectures, practical experience and self-evaluation will address personal wellness in the areas of fitness, nutrition, life choices, and self-management.

**II. PMU Competencies and Learning Outcomes**

The study of Physical Education I provides opportunities to facilitate learning concerning personal fitness and wellness. However, the course will also advance broader learning outcomes such as: Lifelong learning, assessment, and self-reflection of one's self and others in order to foster physical, cognitive, social, and emotional well-being. Content knowledge, discovery, and critical thinking. As well as understanding fundamental concepts of physical activity and health, and applicable critical thinking in order to solve problems from personal, scholarly, and professional perspectives.

**III. Detailed Course Description**

The course serves to assist the student in self-empowerment by developing and promoting healthy eating, attitudes of physical activity and behaviors for themselves and others. The

teaching methodology for the course provides student-centered learning through collaborative enquiry. Physical Education I covers basic topics involving the benefits of physical activity, nutritional guidelines for healthy eating, the various components of health and wellness, and the value of developing healthy lifestyle habits. Students enrolled in PHED 1111 will acquire the knowledge and skills that will allow them to make informed decisions about healthy lifestyle choices, physical wellness, and physical fitness habitual development.

## IV. Requirements Fulfilled

PHED 1111 satisfies PMU Core Curriculum requirement in Humanities and Social Sciences. Whether or not it is a required course is determined by each college's core requirements.

## V. Required Prerequisites

None.

## VI. Learning Outcomes

Students will be able to:

- Recall elements of healthy behavior and nutrition and recognize unhealthy actions, bad food, and their effects.
- Develop an awareness of current health issues in Saudi Arabia.
- Explore various theories/methods relating to healthy behavioral changes.
- Assess and implement personal nutritional and fitness needs.
- Develop, and communicate to others, healthy alternatives in the management of stress.

## VII. Assessment Strategy

The following is the grading itemization and evaluation criteria for PHED 1111. All assessment strategies will be linked to strategies used in the PMU Assessment Capstone Series:

A. Attendance and Participation (30% of grade)

2% will be deducted for each absence and/or more than three late arrivals to class. All students are required to attend class regardless of the ability to participate or not.

B. Individual mini-tasks (15% of grade)

Students will complete various tasks on blackboard throughout the term based on lecture material, this will assist in midterm and final exam preparation.

C. Practical Study (15% of grade)
Students will complete and are expected to participate in PHED II's wellness sport day.

D. Examinations (40% of grade)
Two examinations will be given. Midterm will be worth 20% and a Final worth 20%. No make-up exams will be administered unless a doctor's note for the absence is provided. If a make-up exam is required, it must be written the following day. Subject to discussion during office hours or appointment.

***Important**: please note that ALL assignments must be completed on an individual basis only. You may collaborate for ideas and thoughts however you must submit your own written work evident of no plagiarism and dishonesty. You may however use a source to cite where you retrieved the information you discovered. No copying fellow peers and previous work by other students will be tolerated.

****Assignments/Tasks** that are submitted late will be deducted at 10% per day to a maximum of 3 days, after 3 days the assignment will no longer be accepted.

## VIII. Course format

Students are expected to attend all classes (lecture and practical). The classes will consist of lectures and practical health and wellness based curriculum, discussion, blackboard assignments, active participation, and online discussions.

**Classroom Hours** (in class and online): **1-2 hours per week**

## IX. Topics to be Covered

Theory and practical classes will attempt to illustrate the importance of a healthy lifestyle as it relates to career choice and everyday living (please note some of these topics may be covered in PHED II Core in greater detail). Lecture areas will include:

A. Section I
   1. Lifestyles for Health, Wellness, and Fitness
   2. Determinants and Planning for Behavior Change

B. Section II
   1. An Introduction to Physical Activity
   2. Preparation, Health Benefits, and Principles of Activity

C. Section III
   1. The Physical Activity Pyramid

D. Section IV
   1. Special Topics and Considerations
   2. Anatomy and Functional Movements

E. Section V
   1. Nutrition

## X. Laboratory Exercises

This course does not require a separate lab, however various classes outside of classroom time will consist of a practical component in the sports center.

## XI. Technology Component

Students are expected to have a computer account on BLACKBOARD or some other server to communicate via e-mail. Students should immediately sign into blackboard and gain familiarity with the course. Students are also expected to become familiar with the use of the internet. If an online discussion group is set up to discuss the topics of the course outside of the classroom, students are required to actively participate in this online discussion forum.

## XII. Special Projects/Activities

None

## XIII. Textbooks and Teaching aids

A. Required Textbook

Corbin, C., Welk, Corbin, W., Welk, K., *Concepts of Fitness & Wellness*, 11th Edition, McGraw-Hill Education, 2016.
ISBN 978-1-259-25221-1

**Course Title: PHED 1112: Healthy Behaviors and Management**

**Semester Credit Hours: 1 (1,0)**

## I. Course Overview

Physical Education (Health and Wellness) covers basic topics involving questionable exercises in physical activity, caring for one's back and neck, evaluating fitness products, and the examination of destructive health behaviors.

## II. PMU Competencies and Learning Outcomes

Students of PHED 1112 will acquire the knowledge and skills that will allow them to evaluate fitness products and health gyms, and make informed decisions concerning destructive lifestyle habits. In the process they will evaluate their exercise habits as well as their current lifestyle habits. They will spend time reading the course textbook and exploring the internet for relevant resources.

## III. Detailed Course Description

The course begins with an overview of exercises considered unhealthy. This is followed by an examination of how to care for one's back, neck, and posture. Destructive health behaviors are discussed requiring students to complete a major assignment. The students are also required to evaluate fitness products advertised in the media, and learn about stress management techniques. The teaching methodology for the course provides student-centered learning through collaborative enquiry.

## IV. Requirements Fulfilled

The course is a required University Core course for all students during their undergraduate study.

## V. Required Prerequisites

None.

## VI. Learning Outcomes

Students will be able to:

- Recognize and define destructive health behaviors.
- Identify questionable exercises and adopt healthier alternatives.
- Develop the ability to critically evaluate fitness products advertised in the media and make personal informed choices
- Apply advanced stress management techniques building on what was learned in PHED I.
- Assess trends in the health care and fitness industry and communicate them to others.

## VII. Assessment Strategy

Assessment here focuses on the student's ability to understand key principles relevant to health and wellness. This is based on information taken from the written assignment, the exam, the student's lab reports and their weekly questionnaires.

- Students will complete one written assignment as well as five lab reports.
- There is one exam.

| | Assessment Task | Weight |
|---|---|---|

| | | |
|---|---|---|
| 1. | **Assignment Health and wellness**<br>Complete a paper on the impact of health and wellness on one's everyday life | **30%** |
| 2. | **Exam** | **20%** |
| 3. | **Lab reports**<br>Descriptions of the physical education classes (X 5) | **25%** |
| 4. | **Participation**<br>Students must participate in at least 5/7 sports classes | **25%** |
| | **Total** | **100%** |

## VIII. Course Format

For the first half of the semester this course meets in a seminar format, one hour per class, one class per week. In classes students will be required to take notes. In the second half of the semester the course meets at the PMU sports facilities, one hour per class, one class per week.
BLACKBOARD

- Course syllabus
- Course assignments
- Links to related Web sites (See "Supplemental Online Materials.")
- Course calendar (an active utility)
- Course e-mail utility (an active utility)
- Students' course grades (an active utility)

## IX. Topics to Be Covered

1. Performance Benefits of Physical Activity (Chapter 12)
2. Nutrition and Body Composition (Chapter 13)
3. Posture, Questionable Exercises, and Care of the Back and Neck (Chapter 11)
4. Evaluating Fitness Products (Chapter 23)
5. Use and Abuse of Tobacco (Chapter 18)
6. Use and Abuse of Alcohol (Chapter 19)
7. Cancer, Diabetes, and Other Health Threats (Chapter 22)
8. Stress and Health (Chapter 16)
9. Stress Management (Chapter 17)
10. Self-Management and Self-Planning Skills for Healthy Behaviors (Chapter 2)

## X. Laboratory Exercises

During the semester students will attend practical sports classes at the PMU sports facilities.

## XI. Technology Component

Students will need access to BLACKBOARD. It is imperative that students use the Internet to enrich their knowledge in this field and to develop better research skills.

## XII. Textbooks and Teaching Aids

A. Required Textbook

Corbin, C., Welk, Corbin, W., Welk, K., *Concepts of Fitness & Wellness*, 11th Edition, McGraw-Hill Education, 2016. ISBN 978-1-259-25221-1

# APPENDIX

**Measuring Degrees of Success**

## MEASURING DEGREES OF SUCCESS

### A. CREATING AND USING ASSESSMENT PROTOCOLS

The following is the process of assessing student learning outcomes. It is based on proven approaches that have been successfully implemented at universities internationally. However, the protocols used in assessing student learning at the PMU are created using standards and expectations developed by the university faculty in close cooperation with the staff of the Professional Development Center and the Learning Resources Center.

#### 1. The Goals of Assessment

Learning assessment is designed to help students achieve two goals:

- To develop the skills of learning on their own.
- To take advantage of the lessons that experience and self-reflection can teach.

Assessment protocols are designed to become part of this process. The creation of protocols brings faculty together to discuss and determine their expectations for student performance. In this process, faculty learn from each other about different levels of behavior. Faculty also grow to better understand the student behavior that they observe. Ultimately, students benefit from the protocols, because they understand the expectations that faculty have of them.

#### 2. A Guide to Learning Not Grading

Assessment protocols are not a grading system. They are a guide. Assessment protocols are a technique for achieving agreement within the learning community of student performance expectations.

Obviously, students will master the learning criteria in varying degrees. Moreover, each of the assessment courses, including the Assessment Capstone Series, will require different levels of mastery. The one semester course taken in the sophomore year will require less mastery than the two semester course taken in the junior year. And, the three semester hour assessment capstone will be most demanding.

#### 3. The Protocol System

The protocols below are presented as examples of factors that faculty take into consideration as they evaluate students' success in mastering PMU learning outcomes and competencies.

These protocols provide a number of guides for learning assessment.

- Expectation – the desired learning outcome and competency.
- Indicators – behaviors associated with the abilities students are expected to demonstrate.
- Criteria – qualities of student performance.
- Standards – behaviors associated with various levels of performance.

### B. COMMUNICATION

#### 1. Expectation

The student will be able to communicate effectively in both English and Arabic in professional and social situations.

**2. Indicators of Success**

1. Determines the nature and extent of information needs.
2. Accesses needed information.
3. Critically evaluates the quality of information in relation to need.
4. Prepares effective written and oral communications.
5. Delivers effective oral communication.
6. Adheres to ethical practices in the use and communication of information.

**3. Communication Indicator 1**

Determines the nature and extent of information needs.

**Achievement criteria:**

- Scope of content.
- Reliability of content and sources.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Requires extensive assistance to identify an appropriate range of potential reliable content. | With minimal assistance, identifies a comprehensive range of potential reliable content; seeks expert consultation as needed. | Independently identifies an excellent and creative range of potential content; seeks expert consultation for new ideas. |

**4. Communication Indicator 2**

Accesses needed information.

**Achievement criteria:**

- Effectiveness and efficiency of access and retrieval strategies.
- Comprehensiveness of information in relation to need.

| Standards of Performance |
|---|

| Beginning | Intermediate | Advanced |
|---|---|---|
| Requires extensive assistance to implement information search and retrieval strategies; information obtained is minimal in relation to need. | With minimal assistance, implements appropriate information and retrieval strategies; information obtained is comprehensive in relation to need. | Independently implements skillful, highly effective information search and retrieval strategies; information obtained is comprehensive and creative in relation to need. |

5. **Communication Indicator 3**

Critically evaluates the quality of information in relation to need.

**Achievement criteria:**

- Reliability
- Relevance
- Breadth and depth

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Requires extensive assistance to evaluate content and to identify gaps in breadth and depth; is slow to recognize the need for critical evaluation. | With minimal assistance, identifies content appropriate to the need; has little difficulty identifying and overcoming gaps in breadth and depth. | Independently identifies high quality content appropriate to the need; discovers creative and unusual material; easily identifies and overcomes gaps in breadth and depth. |

6. **Communication Indicator 4**

Prepares effective written and oral communications.

**Achievement criteria:**

- Relevance of communication to purpose.
- Organization of content.
- Quality of communication skills.
- Sensitivity to audience needs and interests.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Requires extensive assistance to develop a purposeful communication; has difficulty focusing and organizing content; exhibits poor writing skills; exhibits little sensitivity to audience needs and interests; is unable to develop an oral presentation. | With minimal assistance, develops a purposeful communication; achieves good focus and organization of content; exhibits good writing skills; exhibits appropriate sensitivity to audience needs and interests; develops an effective oral presentation. | Independently develops a purposeful communication; achieves excellent focus and organization of content; exhibits excellent writing skills; exhibits high sensitivity to audience needs and interests; develops an excellent oral presentation. |

7. **Communication Indicator 5**

Delivers an effective oral communication.

**Achievement criteria:**

- Quality of oral communication.
- Effectiveness of presentation strategy.
- Ability to adjust content as needed during delivery.
- Audience reaction.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Exhibits poor oral communication skills; is unable to present material effectively; does not recognize and adjust to listeners' reactions; gets poor audience reaction. | Exhibits good oral communication skills; delivers an effective presentation; recognizes and adjusts to listener's reactions; gets mostly positive audience reaction. | Exhibits excellent oral communication skills; delivers an excellent presentation; recognizes and adjusts to listener's reactions; develops good rapport with audience; gets enthusiastic and positive audience reaction. |

8. **Communication Indicator 6**

Adheres to ethical practices in the use and communication of information.

**Achievement criteria:**

- Knowledge of and adherence to ethical practices.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Is aware of major ethical practice principles related to information use; understands the concept of plagiarism and the importance of acknowledging the work of others. | Explains and consistently applies ethical practice principles in information use. | Consistently applies ethical practice principles in information use; demonstrates a sophisticated understanding of the ethics of using information in a range of contexts. |

## C. TECHNOLOGICAL COMPETENCE

### 1. Expectation

The student will be able to use modern information technologies to acquire information, communicate, solve problems and produce intended results.

### 2. Indicators of Success

a. Uses IT tools for productivity, communication, research, problem-solving and decision-making.

b. Recognizes the implications and ethical issues associated with the widespread use of IT.

### 3. Technological Indicator 1

Uses IT tools for productivity, communication, research, problem-solving and decision-making.

**Achievement criteria:**

- Effectiveness and efficiency of IT skills.
- Consistency in performance.
- Range and depth of knowledge.
- Independence in performance.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| With assistance, demonstrates understanding of and utilizes the essential features of information technology tools; with assistance, produces acceptable information technology products. | Produces good information technology products, most of which meet a professional standard; makes informed decisions in the use of information technology tools; utilizes mid-level to advanced features of information technology tools. | Produces excellent information technology products, all of which meet a professional standard; utilizes a wide range and the advanced features of information technology tools. |

4. **Technological Indicator 2**

Recognizes the implications and ethical issues associated with the widespread use of IT.

**Achievement criteria:**

- Awareness of and critical response to legal and ethical IT issues.
- Awareness of the potential impact of widespread IT use.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Has a growing awareness about a range of legal and ethical issues associated with the use of information technology use; expresses opinions concerning the impact of these issues on individuals and society; is familiar with ethical principles related to the use of information technology. | Is well informed about a range of legal and ethical issues associated with information technology use; expresses well informed opinions concerning the impact of these issues on individuals and society; is consistently ethical in the use of information technology. | Is well informed about a wide range of ethical issues associated with the use of information technology; publicly advocates well reasoned opinions concerning the impact of these issues on individuals and society; expresses well reasoned opinions about the interrelationships among the social, economic, and political factors that arise from widespread use of information technology. |

## D. CRITICAL THINKING AND PROBLEM SOLVING

1. **Expectation**

The student will be able to reason logically and creatively, make informed and responsible decisions and solve problems.

2. **Indicators of Success**

1. Gathers and processes information for decision making.
2. Develops and reasonably defends arguments, positions and decisions.
3. Clarifies problems and develops effective solutions.
4. Executes plans and evaluates results effectively.

3. **Critical Thinking Indicator 1**

Gathers and processes information for decision making.

**Achievement criteria:**

- Selects information relevant to purpose.
- Accurately interprets information and evidence.
- Identifies salient arguments and different points of view.
- Recognizes assumptions and perspectives.
- Evaluates the logic, validity and relevance of data.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| With assistance, identifies a limited range of information suited to purpose; interprets information accurately but simply; identifies some arguments, assumptions and perspectives; conducts minimal evaluation of material. | Identifies a good range of information suited to purpose; accurately interprets information; identifies salient arguments, assumptions, perspectives and alternative points of view; conducts well-reasoned and comprehensive evaluations of material selected for use. | Identifies a comprehensive range of information suited to purpose; relates and synthesizes information from multiple sources; accurately interprets information; recognizes subtle patterns and meanings; draws insightful, logical, and creative conclusions; conducts excellent evaluation of material selected for use. |

4. **Critical Thinking Indicator 2**

   Develops and reasonably defends arguments, positions and decisions.

   **Achievement criteria:**

   - Analyzes and evaluates information and alternative points of view.
   - Draws well-reasoned conclusions.
   - Justifies results by explaining assumptions and reasons for choices.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| With assistance, recognizes the differences and varied perspectives in information sources; draws some reasonable conclusions; provides limited explanation for arguments, positions, and decisions. | Recognizes the differences and varied perspectives in information sources; draws well reasoned conclusions; provides good explanation for arguments, positions, and decisions. | Recognizes the differences and varied perspectives in information sources; is sensitive to implicit assumptions and subtle bias; draws well reasoned, insightful conclusions; provides excellent explanations for arguments, positions, and decisions. |

5. **Critical Thinking Indicator 3**

Clarifies problems and develops effective solutions.

**Achievement criteria:**

- Identifies and clearly describes the problem.
- Develops and evaluates suitable alternative solutions.
- Proposes an appropriate solution.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| With assistance, describes a problem; explains what can be done about it; identifies several possible solutions; proposes a solution; inadequately defends the appropriateness of the solution. | Clearly and concisely states a problem; seeks input from others; explains what should be done and why; proposes several suitable solutions; presents logical pros and cons for each; proposes an appropriate solution and offers good reasons for choice. | Clearly and concisely states a problem; seeks input from others; insightfully explains what should be done and why; proposes several appropriate and creative solutions; presents logical pros and cons for each; proposes the most appropriate solution and offers excellent reasons for choice. |

6. **Critical Thinking Indicator 4**

Executes plans and evaluates results effectively.

**Achievement criteria:**

- Determines needed resources.*
- Identifies, organizes and schedules critical tasks.
- Follows-through, adapts and persists to problem resolution.
- Evaluates results.

**Resources could include decisions, permissions, people, and material.*

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| With assistance, identifies most needed resources; organizes and sequences critical tasks; poorly executes some tasks; achieves inadequate results; recognizes and explains some but not all strengths and deficiencies of the intended solution. | Identifies and acquires needed resources; logically sequences critical tasks; adjusts implementation as needed; executes most tasks effectively and on schedule; explains the strengths and deficiencies of the solution; makes suggestions for future improvement and problem prevention. | Identifies and achieves all needed resources; organizes and implements critical tasks very well; makes timely and creative adjustments; provides excellent explanations of the strengths and deficiencies of the solution; makes excellent suggestions for improvement and future problem prevention. |

## E. PROFESSIONAL COMPETENCE

### 1. Expectation

The student will be able to perform professional responsibilities effectively in both local and international contexts.

### 2. Indicators of Success

1. Maintains a good work ethic.
2. Sustains positive relations with supervisors, co-workers and clients.
3. Performs professional tasks effectively and efficiently in local and international contexts.
4. Improves and increases professional competence over time.
5. Demonstrates integrity and ethical behavior.

### 3. Professional Indicator 1

Maintains a good work ethic.

**Achievement criteria:**

- Adheres to rules and procedures.
- Takes responsibility as necessary to produce expected results.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| With guidance, can adhere to rules and procedures; rarely works extra to meet deadlines; sometimes accepts extra work assignments. | Adheres to rules and procedures; works as needed to meet deadlines; volunteers extra work to complete assignments. | Adheres to rules and procedures; completes assignments by or before deadlines; volunteers work that promotes employer's success. |

4. **Professional Indicator 2**

Sustains positive relations with supervisors, co-workers and clients.

**Achievement criteria:**

- Maintains positive interpersonal relations.
- Supports and promotes employer's vision and goals.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Has difficulty maintaining positive working relationships; sees job primarily in terms of personal benefits. | Maintains positive working relationships; supports employer's goals; sees job as helping employer meet goals and in terms of personal benefit and professional opportunity. | Maintains excellent working relationships; supports and promotes employer's goals; accepts and volunteers work that promotes employer's success; sees job in terms of personal benefit and future professional opportunity. |

5. **Professional Indicator 3**

Performs professional tasks effectively and efficiently in local and international contexts.

**Achievement criteria:**

- Quality of professional performance.
- Organizational skills and time management.
- Attention to quality.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Has difficulty performing at a professional level; is uncomfortable outside a local context; needs to improve time management and organization; rarely recognizes inferior quality. | Consistently performs at a professional level; is increasingly effective in both local and international contexts; organizes and manages time effectively; usually recognizes quality problems and corrects them. | Consistently performs at a high professional level; is very effective in both local and international contexts; organizes and manages time very effectively, produces excellent results; often suggests ways to improve quality. |

6. **Professional Indicator 4**

Improves and increases professional competence over time.

**Achievement criteria:**

- Keeps professional knowledge and skills current.
- Maintains an active program of professional development.

- Improves performance through disciplined reflection and self-assessment.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Knowledge and skills are not always current; needs encouragement to engage in professional development activities; rarely reflects on personal performance to identify ways to improve. | Knowledge and skills are current; maintains a regular professional development program; regularly reflects on personal performance and finds ways to improve performance. | Knowledge and skills are at the leading edge; maintains an aggressive professional development program; frequently reflects on personal performance and regularly improves performance. |

7. **Professional Indicator 5**

Demonstrates integrity and ethical behavior.

**Achievement criteria:**

- Knowledge of and commitment to practice ethical principles in personal and professional life.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Is honest and behaves with integrity; sometimes is unaware of professional ethical expectations. | Is honest and trustworthy; understands and meets personal and professional ethical expectations; is recognized and respected by others for principled behavior. | Is honest and trustworthy, understands and always meets personal and professional ethical expectations; is recognized and respected by others as a role model for principled behavior; promotes ethical behavior of others. |

## F. TEAMWORK

### 1. Expectation

The student will be able to work effectively with others to accomplish tasks and achieve group goals.

### 2. Indicators of Success

1. Cooperates and assumes responsibility for individual contributions and group results.
2. Uses effective interpersonal and group process skills.
3. Facilitates consensus through negotiation and compromise.

### 3. Teamwork Indicator 1

Cooperates and assumes responsibility for individual contributions and group results.

**Achievement criteria:**

- Sensitivity to others' needs interests and concerns.
- Openness to ideas and suggestions.
- Willingness to accept responsibility and take accountability for results.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| May disagree with others' opinions but tolerates their expression; rarely responds to others' ideas and suggestions; seldom produces results. | Listens and responds to others' ideas in a positive and constructive manner; contributes useful ideas and suggestions and makes appropriate adjustments based on feedback; offers to take responsibility; produces good results, willingly accepts accountability for outcome. | Consistently listens and responds to others' ideas in a positive and constructive manner; frequently offers excellent ideas and suggestions and makes appropriate adjustments based on feedback; guides the group toward ideas and suggestions with greatest potential; often takes responsibility; produces excellent results and always accepts accountability for outcome. |

4. **Teamwork Indicator 2**

Uses effective interpersonal and group process skills.

**Achievement criteria:**

- Understands and accepts the strengths and limitations of group members.
- Makes constructive contributions to group discussions and debates.
- Appropriately responds to others' confusion, anger, and distress.
- Suggests ways to improve the efficiency and effectiveness of the group.

| **Standards of Performance** | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Has difficulty identifying the potential of group members; rarely makes constructive contributions to discussions or debates; responds poorly to others' frustrations; rarely offers suggestions that could improve group process. | Identifies and acknowledges the potential of each group member; makes constructive contributions to discussions and debates; responds appropriately to others' frustrations; suggests ways to improve group process. | Identifies and publicly praises the contributions and potential of each group member; frequently makes constructive contributions to discussions and debates; empathizes and skillfully supports others through frustrating experiences; takes action that improves group process. |

**5. Teamwork Indicator 3**

Facilitates consensus through negotiation and compromise.

**Achievement criteria:**

- Offers useful and creative ideas that improve group goals and process.
- Offers and accepts feedback that moves the group toward agreement.
- Promotes modifications or alternatives that foster consensus.
- Acknowledges and supports others' contributions.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Occasionally suggests ideas that contribute to agreement; has difficulty building forward from others' ideas; offers weak or negative feedback; sometimes acknowledges others' contributions. | Assists the group to focus on the goal; offers good ideas that contribute to agreement and improve group performance; offers and readily accepts constructive feedback; supports alternatives and modifications that foster consensus; usually acknowledges and supports others' contributions. | Assists the group to focus on the goal; offers excellent ideas that contribute to agreement and improve group performance; encourages and easily accepts feedback from others; facilitates group analysis and acceptance of better ideas; summarizes agreements to foster consensus; frequently acknowledges and supports others' contributions. |

## G. LEADERSHIP

### 1. Expectation

The student will be able to function as an informed, effective and responsible leader in family, community and the nation.

### 2. Indicators of Success

1. Offers vision and purpose that inspires others' confidence and following.
2. Effectively plans and organizes projects.
3. Effectively delegates responsibility and coordinates group work.
4. Produces quality results.

### 3. Leadership Indicator 1

Offers vision and purpose that inspires others' confidence and following.

**Achievement criteria:**

- Communicates visionary and appropriate goals.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Rarely convinces others to participate in a project he/she proposes; has difficulty sustaining others' commitment and participation over the project's duration. | Convinces others to participate in a project he/she proposes; usually sustains their commitment and participation over the project's duration. | Easily convinces other to participate in a project he/she proposes; sustains their commitment and enthusiastic participation over the project's duration. |

4. **Leadership Indicator 2**

Effectively plans and organizes projects.

**Achievement criteria:**

- Determines and sequences tasks required to meet objectives.
- Develops timelines and schedules that satisfy deadlines.
- Acquires needed resources. *

**Resources include policies, agreements permissions, financing, personnel and materials.*

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| With assistance, identifies and sequences project tasks; has difficulty plotting realistic timelines; identifies some, but not all required resources. | Identifies and sequences project tasks; plots realistic timelines; identifies and procures all needed resources. | Identifies and sequences project tasks; plots realistic timelines that include contingency strategies; identifies and procures all needed resources. |

5. **Leadership Indicator 3**

Effectively delegates responsibility and coordinates group work.

**Achievement criteria:**

- Communicates goals effectively.
- Respect for individual abilities in the delegation of tasks.
- Motivates, sustains morale and positive interpersonal relations.
- Monitors progress and takes corrective action as needed.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Communicates unclear goals; has difficulty delegating tasks to the most qualified individuals; has difficulty identifying problems and taking corrective action; does not consistently sustain productivity and morale of workers. | Usually communicates clear goals; delegates tasks to the most qualified individuals; resolves conflicts; sometimes prevents problems and takes timely corrective action; sustains worker productivity and morale over time. | Communicates clear goals; delegates tasks to the most qualified workers; prevents most conflicts and resolves them quickly if they arise; prevents most problems and takes timely corrective action; sustains worker productivity and morale over time. |

6. **Leadership Indicator 4**

Produces quality results.

**Achievement criteria:**

- Motivates and supports quality performance from others.
- Effectively supervises and monitors work.
- Adjusts to context.
- Meets or exceeds quality expectations and standards.

| Standards of Performance | | |
|---|---|---|
| **Beginning** | **Intermediate** | **Advanced** |
| Has difficulty communicating quality expectations; provides erratic supervisory oversight; is uncomfortable outside a local context; produces poor quality results. | Communicates expectations consistent with recognized quality standards; generally provides effective supervisory oversight; regularly monitors output for adherence to quality expectations; takes corrective action as needed; usually produces results that meet quality expectations. | Communicates quality expectations that exceed recognized quality standards; effectively motivates others to better performance; is very effective in both local and international contexts; provides effective and supportive supervisory oversight; closely monitors output and frequently encourages quality improvement; usually produces results that exceed quality expectations. |