

Hope University College
Faculty of Information Sciences
Department of Information Systems



Revised Curriculum
Version II

April, 2014
Addis Ababa

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1. Introduction

Information Systems is one the BSC Programs of Hope University College that was accredited by Higher Education Relevance and Quality Agency (HERQA) in August 2003 E.C. Due to the very fact that curricula are dynamic by their nature; the first version of this curriculum has been revised in the process of reaccreditation and the updates have been incorporated in this second version.

2. Program Rationale

Information is increasingly becoming a key strategic resource for effective and sustainable development of any type of organization in our contemporary society. Recent advancements and applications of information systems and communication technologies have transformed the structure of international and national economies leading to new methods and practices in business systems and academic institutions. Schools of information systems (IS) and technologies (IT). Developing countries have long recognized this fact and introduced information systems into their educational curricula.

Hope University College, as one of Higher Learning Institutions which aspires to contribute to the renewal and transformation of society through knowledge and value-based education by producing graduates who can make a difference in the national economy, has launched Information Systems program among others.

3. Departmental Vision, Mission and Objectives

3.1 Vision Statement

The vision of the Department of Information Systems of Hope University College is to be a lead institution in offering state-of-the-art knowledge that integrates information systems with business and thus prepares highly skilled and qualified graduates who can accomplish various tasks in the field.

3.2 Mission Statement

The mission of the Department is the integration of computing resources to support the operations, analysis, decision-making and planning functions in business organizations.

3.3 Objectives

The general objective of the IS program is to equip graduates with the theories and practices of modern business information systems and services at the national, regional and international levels. The program will enable students to design and develop information systems for business-oriented applications such as accounting systems, payroll systems, enterprise resource planning systems, and so forth. Students majoring in this field of study will understand and model both business processes as well as information processes. Students are required to manage software design and database design.

The specific objectives of the IS program are to:

- Foster an understanding of the theoretical and empirical bases of Information Systems as a discipline;
- Develop expert knowledge of IT-based information systems engineering/development and management;
- Instill knowledge of the economic, social, and strategic values of information;
- Make students understand and be able to use the analysis, design and management techniques within various user-oriented information systems.
- Enable students design and develop information systems for business oriented application;
- Provide a sound basis for further research in Information Systems.

4. Graduate Profile

All HOPE UNIVERSITY COLLEGE graduates shall exhibit the following profiles:

4.1 General Profile

Integrity and Personal Accountability: appreciating and internalizing high integrity and taking responsibility for one's actions at work and in society.

Self-regulation: instilling attitudes for self-development through lifetime learning, initiative taking and self-correction.

Intellectuality: working scientifically, using analytical skills, to develop and carry out research that is valuable to the country's needs and development; writing and presenting one's findings in clear and coherent manner and by so doing contributing to knowledge.

Competence: capacity to apply the knowledge transmitted and adds value in one's role within organizations.

Leadership: playing a leading role in organizations and making a difference with team work, respect for people, exceptional integrity, motivation and commitment.

4.2 Professional Profile

4.2.1 General Knowhow

The graduates of the program will have knowledge in the following foundational areas of IS:

- Theoretical background in the functioning of computers and application of computers to business and other disciplines;
- Theories, principles, processes and techniques of organization, storage, retrieval, dissemination and utilization of all forms of information;
- Understanding computers and communication systems, including basic systems analysis and design, network design, database development, implementation and management;
- Knowledge of basic principles of IS-based business information processing;
- Knowledge of organizational behavior and business principles;

- Theories, practices and principles of information systems analysis, design, development and management;
- Exposure to various types of academic and business information resources, systems and services;
- Principles and various approaches of computer programming and algorithm development to solve real-world problems;
- Theories, practices and principles of business process engineering for a creative manner to solve information-related problems of businesses and organizations.

4.2.2 Specific Knowhow

The graduates shall have the competencies to

- Design, implement and evaluate various information systems and multimedia resources including the internet;
- Manage business information systems and services (organization and retrieval of business information);
- Manage and actively participate in information system development projects;
- Analyze, design, develop, manage and evaluate business information systems from different perspectives;
- Provide information system/technology consultancy services;
- Solve problems in business enterprises through application of information communication technology and development of decision support information systems;
- Plan and execute projects related to information systems development, resources and services.
- Manage and write computer programs using different technologies to solve information-related problems like storage, retrieval and management of information.

4.2.3 Transferable Skills

Graduates will be equipped with transferable skills to:

- Work in teams in information systems projects and systems development;
- Have good communication skills with business people;
- Have self-management skills.

4.2.4 Attitudinal and Values Competency

The graduates will

- Appreciate professionalism in their area of work.
- Be passionate about their professional engagement.
- Have a positive and responsive attitude towards the value of information resources.

- Have personal confidence in doing their jobs.
- Be self-critical and endeavor constantly to reform themselves to create a difference in their professional roles.
- Work with others exhibiting high respect, cooperative spirit and a serving attitude.
- Take initiatives and prepare themselves for both employment and self-employment.

4.3 Program Profile

In the Department of Information Systems at HOPE UNIVERSITY COLLEGE, students learn problem-solving, critical thinking, communication and team skills, which prepare them for leadership positions in the information systems field. Students gain familiarity with modeling business process workflows, systems integration, and project management. The program prepares students for professional careers in the rapidly expanding field of computer based business systems.

Typical areas of employment or self-employment for graduates include: Data Base Analyst, Systems Analyst, Manager of Information Systems, Hardware or Software Sales Representative, Technical Writer, Systems Consultant, Information Analyst.

5. Teaching Philosophy and Methodology

5.1 Teaching Philosophy

Based on the mission of HOPE UNIVERSITY COLLEGE and the outcomes of the discussions with relevant stakeholders the following elements constitute the philosophy of the curriculum:

- Excellence in applying scientific knowledge in a professional setting.
- Continual interaction between the faculty, students and professional learning environments to enable competence.
- Integration of theory and practice to train excellent professionals.
- Ongoing contact with the private and public sectors and other stakeholders to develop a curriculum that is relevant, competitive and value-adding.
- The development of competencies as an indispensable outcomes of the curriculum.
- The reinforcement of teaching with coaching to effect holistic student development.

5.2 Teaching Methodology

Competency based education, which is a student-centered methodology, emphasizes theory alongside skills, workplace interface and personal development. In this interaction, there shall be classroom lectures, laboratory activities, application exercises in the private sector. Students will also engage in presentations, group projects, which reflect actual situations in business or industry.

Competency based education stresses the interrelationship of several learning dimensions in which the students combine knowledge, skills, motivation and attitude to create effective learning processes and to meet the standards of Hope University College.

The educational program will be characterized by increasing complexity. Knowledge, skills, attitude and competencies will be tested at several levels during all semesters. The following five complexity-dimensions are distinguished:

- Level of self-management of the student
- Level of professional cases to be dealt with
- The level of knowledge (and required analytical skills) to understand a specific subject
- The number of instruments, tools and methods needed to approach the subject

The department acknowledges these dimensions and challenges the students in their process towards professional maturity. Therefore, the curriculum has the integrative elements between theory and practice, between the different disciplines that are taught (a multi-disciplinary approach), and between the constituting parts of a competency. Furthermore, the curriculum has integrative elements between linguistic, calculative, analytic, synthetic, technical and ethical tools to explore available knowledge and develop an intellectual maturity for better judgement, leadership and knowledge.

6. Assessment Methods

6.1 Student Assessment

A student's achievement level for a course shall be assessed principally by examinations to gauge content competence and by assignments, laboratory tests and projects to assess knowledge. Ongoing assessment by way of tests shall help in identifying a student's ability and for helping a student catch up.

6.1.1 The Grading System

The grading system criterion is referenced with a five scale assessment ranging from A to F as presented below:

| | | | | | | | | | | |
|-------|----------|----------------|----------------|---------|----------------|----------------|---------|----------------|---------|----------|
| Score | [86,100] | [80,86) | [76,80) | [70,76) | [66,70) | [60,66) | [50,60) | [47,50) | [37,47) | Below 37 |
| Grade | A | A ⁻ | B ⁺ | B | B ⁻ | C ⁺ | C | C ⁻ | D | F |
| Value | 4.00 | 3.75 | 3.50 | 3.00 | 2.75 | 2.50 | 2.00 | 1.75 | 1.50 | 0.00 |

6.2 Program Assessment

To guarantee the quality and standard of the program the Department:

- Provides on-the-job training upgrading the academic qualification of the staff as needed.
- Gathers feedback from students, employers and graduates as deemed necessary and uses the feedback to improve the curriculum.

- Has prepared and has in place rules governing delivery and assessment of courses.
- Performs regular evaluation of the program based on the current trends in the field and the country's skilled manpower need
- Periodically acquires appropriate textbooks/references, laboratory equipment, software applications and so forth.
- Prepares a course syllabus for all courses offered in the department in order to standardize the course content.
- Carries out regular evaluation of staff

7. Admission Requirements of the Department

A candidate will be eligible for admission if he/she fulfills the minimum admission requirement

- ✓ Set by the Ministry of Education for the year
- ✓ Advance standing
- ✓ Transfer from an accredited higher institution for degree program
- ✓ TVET graduates who are certified by COC agency, have two years of service and entrance examination of the University College

8. Duration of Study

The duration of study for the Degree of Bachelor of Science in Information Systems is four years for regular program and five years for extension.

9. Degree Nomenclature

The degree offered after successful completion of the program is called:

- In English – “Degree of Bachelor of Science in Information Systems”
- In Amharic – “ የ ሳይንስ ባችለር ዲግሪ በኢንፎርሜሽን ሲስተምስ ”

10. Graduation Requirements

Graduating students shall be awarded the “Bachelor of Science Degree in Information Systems” if they fulfill the following requirements:

- An attainment of a minimum of 144 credit hours
- An attainment of a minimum Cumulative Grade Point Average of 2.00
- An attainment of a minimum Cumulative Grade Point Average of 2.00 in major courses
- An absence of F, NG, and I in any course grading.

11. Course Coding

All the Information Systems course start with the prefix INSY representing INformationSYstems followed by three digits.

- The first digit represent the year in which the course is delivered.
- The middle digit signifies the categorization of courses in the program. The following categories together with their codes are identified to cluster the courses:

0: Basics Courses

1: Programming

2: Database and IR

3: Systems

4: Hardware, Networking and Operating Systems

5: Special

The last digit indicates the semester in which the course is offered:

- An odd last digit shows that the course is offered in the first semester
- An even last digit shows that the course is offered in the second semester.

Remark:

- The supportive courses take their code numbers from the owner departments.
- The above rule of course coding does not bind cross-cutting courses.

12. Quality Assurance

The university college shall have a section for Quality Assurance as an internal audit of the academic program. The director of this section shall ensure quality by monitoring and evaluating academic programs and achievements on a regular basis using set benchmarks for academic excellence.

- 12.1 The internal scheme of performance audit shall enable constant renewal and relevance in the university college. The audit will review the actual outcomes of the content and pedagogy of disciplines by departments, courses, programs and also student competencies.
- 12.2 Though the established goals, objectives and desired outcomes of the university college will be important benchmarks of the audit, the evaluation efforts, being focused on value-adding features, may point to the revisiting of certain objectives and activities of the curriculum.
- 12.3 In this way the university college will be made aware of what it needs to change and make the necessary adjustments to stay abreast of the latest developments of knowledge. In the end the curriculum is intended to develop graduates who demonstrate proficiency in general knowledge, communication, critical thinking, contextual competence, aesthetic sensibility, professional identity and ethics, leadership capacity, scholarly concern for improvement and motivation for continued learning.
- 12.4 The curriculum anticipates a qualitative change in the mental and spiritual capacities of students. In this regard, every attempt will be made to

transform the capacities of students to a level that would make them change makers. The evaluation will track these outcomes and assess the qualitative changes gained in each student.

- 12.5 Considering the danger of internal evaluation from the standpoint of defensive pretensions by all concerned, internal evaluations will be counterbalanced by external ones (including HERQA, employers and donors). These would be openly discussed for subsequent adjustments.

The department shall do a review of the program after four years of implementing this curriculum by collecting feedback from employers and graduates of the program. This review will help to maintain the quality of the program in line with the demand of the employers and the country at large. Methods of quality assurance of the program will include but not be limited to:

- Comprehensive examinations and colleague assessment of examination papers and teaching methods;
- Periodic workshops (with stakeholders, teachers and graduates);
- Assessments by using survey project works (research), internships, and link programs;
- Graduates' evaluation of the program, establishing a graduate alumni organization as a mechanism to implement such evaluations and follow their career paths;
- Standardization of course offerings through preparation of general course outlines, exam contents, and external audit;
- Annual assessment of the program by the teaching staff;
- Working closely with the relevant professional associations to assess graduates' performance.

13. Resource Requirements

13.1 Teaching Staff

To the extent that the quality of education to be provided is primarily dependent on the skill and excellence of its staff members, Hope University College shall engage outstanding faculty members from within country and abroad in teaching.

13.2 ICT Laboratory

HOPE UNIVERSITY COLLEGE shall avail adequate computer terminals for students and faculty to enable online learning and reading, sharing knowledge and experiences and working with various software that contributes to one's professional development. In such laboratories one shall also get assistance in digital connections and systems use.

13.3 Library Facilities

Students will have access to a spacious and well-stocked library. Computers will be available in the library to provide students with the facility for writing and with internet connectivity for access to e-books and online learning solutions. Students shall use a computerized catalog for instant access to the resources in the library.

13.4 Tutorial Service for a Course Taught

13.4.1 The faculty member of a course is the TUTOR of his/her students.

13.4.2 To enable tutoring the faculty member shall designate office hours and inform his students of the same. The faculty member is expected to be in their office during the hours designated.

13.5 Guidance and Counseling

13.5.1 The office of student life shall provide guidance in a number of areas that contribute to the character development of students focusing on themes such as interpersonal relations, personal acceptance and care, life goals, survival skills, work ethics, relations with the opposite gender, community responsibility, right assertiveness, handling grievance and personal crisis, tolerance, reconciliation, time management, self-assessment, etc. in an open ended and non-judgmental manner.

13.5.2 The office of student life shall avail a counseling service to those students that exhibit emotional burden, are at a loss, have a hard time focusing on their studies and responsibilities and show difficulty in relating to others. If the mental state of a student requires professional help the student shall be told to seek professional help at his expense. Severe cases shall be allowed to take a semester or a year off.

13.5.3 As counseling revolves around trust a female counselor shall be available for women and a male counselor for men. Peer counseling as well as peer discussions will also be advanced to facilitate the growth and discovery processes in a non-judgmental way.

13.5.4 All counseling communications will be confidential.

13.5.5 The university college shall do its best to reduce impersonality and the kind of atomization that comes from large crowds. While the architecture of the university college is designed to help in this regard by giving ample opportunities for students to interact with one another, every effort shall be made to provide a sense of community that encourages belongingness, involvement and high spirits.

13.5.6 Common problems shall be addressed by the university college and remedies sought as quickly as possible so that unaddressed problems do not cause more harm than what exists.

14. Class Size

To enable manageable faculty attention to students, convenience of learning and the continuous assessment that shall be applied, the optimal class size of the university college shall be:

- 25 to 35 students for courses in a regular class,
- 50 to 70 students for lecture type courses,
- 15 to 25 students for workshops and laboratories.

15. Program Structure

The Information Systems program is designed to be completed within eight semesters. Each semester shall have 16 class weeks excluding exam administration and other administrative tasks.

There shall be one internship program two and a half months before the end of the third academic year. During this period students will have a chance to work in an actual work setting using their competencies.

The courses in the program are major, supportive and cross-cutting courses. The major courses are compulsory and shall be 100 credit hours for one to graduate.

The major, supportive and general courses are presented below.

15.1 List of Courses

Table 1: List of Major Courses.

| Course No. | Course Title | Cr Hrs | Lect. Hrs | Lab Hrs* | Prerequisite |
|-------------------|--|---------------|------------------|-----------------|------------------------------------|
| INSY 201 | Introduction to Information Communication Technology | 4 | 3 | 2 | None |
| INSY 212 | Fundamentals of Programming | 4 | 3 | 2 | INSY 201 |
| INSY 242 | Computer Architecture and Organization | 4 | 4 | 0 | INSY 201 |
| INSY 311 | Object Oriented Programming | 4 | 3 | 2 | INSY 212 |
| INSY 312 | Internet Programming I | 3 | 2 | 2 | INSY 212 |
| INSY 313 | Data structure and Algorithm Analysis | 3 | 2 | 2 | INSY 212 |
| INSY 322 | Fundamentals of Database Management Systems | 3 | 2 | 2 | INSY 201 |
| INSY 331 | Structured System Analysis and Design | 3 | 3 | 0 | INSY 201 |
| INSY 340 | Operating Systems | 4 | 3 | 2 | INSY 313 |
| INSY 411 | Internet Programming II | 3 | 2 | 2 | INSY 312 |
| INSY 412 | Visual Programming | 4 | 2 | 4 | INSY 311 |
| INSY 421 | Advanced Database Management Systems | 3 | 2 | 2 | INSY 322 |
| INSY 423 | Introduction to Information Storage and Retrieval | 3 | 3 | 0 | INSY 322 and INSY 313 |
| INSY 531 | Multi Media Systems | 3 | 2 | 2 | INSY 313 |
| INSY 433 | Object Oriented System Analysis and Design | 3 | 3 | 0 | INSY 331 and INSY 311 |
| INSY 434 | Introduction to Artificial Intelligence | 3 | 2 | 2 | INSY 313 and MATH 203 |
| INSY 532 | Business Process Management | 3 | 3 | 0 | MAEN 422 |
| INSY 441 | Data Communication and Computer Network | 4 | 4 | 0 | INSY 201 |
| INSY 442 | Systems and Network Administration | 3 | 2 | 2 | INSY 441 and INSY 340 |
| INSY 452 | Information Systems Project Management | 3 | 3 | 0 | INSY 331 |
| INSY 502 | Information and Society | 3 | 3 | 0 | INSY 201 |
| INSY 432 | Management of Information Systems and Services | 3 | 3 | 0 | MAEN 422 |
| INSY 534 | Decision Support Systems | 3 | 3 | 0 | STAT 301and INSY 201 |
| INSY 444 | Computer Maintenance and Technical Support | 3 | 2 | 2 | INSY 201 |
| INSY 551 | Internship | 3 | 0 | 6 | Completing 3 rd year |
| INSY 555 | Senior Project I | 3 | 0 | 6 | INSY 421, INSY 433, INSY 411 |
| INSY 552 | Senior Project II | 3 | 0 | 6 | INSY 555 |
| INSY 553 | E-Commerce | 3 | 3 | 0 | INSY 411 |
| INSY 554 | Information Assurance and Security | 3 | 3 | 0 | INSY 442 and INSY 421 |
| | Total | 94 | 70 | 48 | |

Remark*: 1 Credit hour is equivalent to 1 lecture hour or 2 hours of laboratory sessions.

Table 2: List of Major Elective Courses

Students are supposed to select two courses out of the following list.

| Course No. | Course Title | Cr Hrs | Lect. Hrs | Lab Hrs | Prerequisite |
|--------------|--|----------|--------------|--------------|--------------|
| INSY 504 | Selected Topics in information Systems | 3 | 3 | 0 | |
| INSY 521 | Data Mining and Warehouse | 3 | 2 | 2 | INSY 322 |
| INSY 522 | Knowledge Management | 3 | 3 | 0 | INSY 201 |
| INSY 536 | Expert System | 3 | 2 | 2 | INSY 434 |
| INTE 541 | UNIX system administration and support | 3 | 2 | 2 | INSY 340 |
| Total | | 6 | 4/5/6 | 0/2/4 | |

Table 3: List of Supportive Courses

| Course No. | Course Title | Cr. Hrs. | Lect. Hrs. | Lab Hrs. | Prerequisite |
|--------------|--|-----------|------------|----------|--------------|
| ACCN 211 | Principles of Accounting | 3 | 3 | - | None |
| MAEN 214 | Introduction to Small Business Management and Entrepreneurship | 3 | 3 | - | None |
| MAEN 422 | Organizational Behavior | 3 | 3 | - | MAEN 214 |
| MATH 203 | Mathematics I | 4 | 3 | | None |
| MATH 204 | Mathematics II | 4 | 3 | - | MATH 203 |
| STAT 301 | Introduction to Probability and Statistics | 3 | 3 | - | None |
| Total | | 20 | 21 | 0 | |

Table 4: List of General Courses

| Course No. | Course Title | Cr. Hrs. | Lect. Hrs. | Lab Hrs. | Prerequisite |
|--------------|-----------------------------------|-----------|------------|----------|--------------|
| CEED 201 | Civic and Ethical Education | 3 | 3 | - | None |
| FLEN 201 | Basic writing skills | 3 | 3 | 1 | None |
| FLEN 202 | English for Communication I | 3 | 3 | 1 | FLEN 201 |
| FLEN 301 | English for Communication II | 3 | 3 | 1 | FLEN 202 |
| MAEN441 | Leadership Skills | 3 | 3 | - | None |
| PHIL 201 | Introduction to Philosophy(Logic) | 3 | 3 | - | None |
| PSYC 201 | General Psychology | 3 | 3 | - | None |
| ECON 202 | Microeconomics | 3 | 3 | - | None |
| Total | | 24 | 21 | 3 | |

Table 5: Minimum Credit Hour Requirement Summary

| Course Type | Total Credit Hours |
|------------------------|---------------------------|
| Major Courses | 94 |
| Major Elective Courses | 6 |
| Supportive Courses | 20 |
| General Courses | 24 |
| Grand Total | 144 |

16.Semester Course Break-Down

16.1 Regular Program

| Year | Semester I | | |
|-----------------------|-----------------------|--|-----------|
| 1 | Course No | Course Title | Cr.HrS |
| | CEED 201 | Civic and Ethical Education | 3 |
| | MATH 203 | Mathematics I | 4 |
| | INSY 201 | Introduction to ICT | 4 |
| | FLEN 201 | Basic writing skills | 3 |
| | PHIL 201 | Introduction to Logic | 3 |
| | Semester Total | | 17 |
| | Semester II | | |
| | Course No | Course Title | Cr.HrS. |
| | INSY 232 | Computer Organization and Architecture | 4 |
| | MATH 204 | Mathematics II | 4 |
| | ECON 202 | Microeconomics | 3 |
| | FLEN 202 | English for Communication I | 3 |
| | INSY 212 | Fundamentals of Programming | 4 |
| Semester Total | | 18 | |

| Year | Semester I | | |
|-----------------------|---|---|-----------|
| 2 | Course No | Course Title | Cr.Hrs. |
| | INSY 331 | Structured Systems Analysis and Design | 3 |
| | ACCN 211 | Principles of Accounting – I | 3 |
| | INSY 313 | Data structure and Algorithm Analysis | 3 |
| | FLEN 301 | English for Communication II | 3 |
| | INSY 311 | Object Oriented Programming | 4 |
| | Semester Total | | 16 |
| | Semester II | | |
| | Course No | Course Title | Cr.Hrs. |
| | STAT 301 | Introduction to Probability and Statistics | 3 |
| | INSY 312 | Internet Programming I | 3 |
| | MAEN 214 | Introduction to Small Business and Entrepreneurship | 3 |
| | PSYC 201 | General Psychology | 3 |
| | INSY 340 | Operating Systems | 4 |
| INSY 322 | Fundamentals of Database Management Systems | 3 | |
| Semester Total | | 19 | |

| Year | Semester I | | |
|-------------|-----------------------|---|----------------|
| 3 | Course No | Course Title | Cr.Hrs. |
| | INSY 421 | Advanced Database Management Systems | 3 |
| | INSY 441 | Data Communication and Computer Network | 4 |
| | MAEN 422 | Organizational Behavior | 3 |
| | INSY 433 | Object Oriented System Analysis and Design | 3 |
| | INSY 411 | Internet Programming II | 3 |
| | INSY 423 | Introduction to Information Storage and Retrieval | 3 |
| | Semester Total | | 19 |
| | Semester II | | |
| | Course No | Course Title | Cr.Hrs. |
| | INSY 412 | Visual Programming | 4 |
| | INSY 442 | Systems and Network Administration | 3 |
| | INSY 452 | Information Systems Project Management | 3 |
| | INSY 414 | Introduction to Artificial Intelligence | 3 |
| | INSY 444 | Computer Maintenance and Technical Support | 3 |
| | INSY 432 | Management of Information Systems and Services | 3 |
| | Semester Total | | 19 |

INSY551 Internship (Offered during the summer of third year) 3

| Year | Semester I | | |
|-------------|-----------------------|------------------------------------|----------------|
| 4 | Course No | Course Title | Cr.Hrs. |
| | INSY 553 | E-Commerce | 3 |
| | INSY 531 | Multi Media Systems | 3 |
| | INSY XXX | Elective I | 3 |
| | MAEN 441 | Leadership Skills | 3 |
| | INSY 555 | Senior Project I | 3 |
| | Semester Total | | 15 |
| | Semester II | | |
| | Course No | Course Title | Cr.Hr |
| | INSY 502 | Information and Society | 3 |
| | INSY 534 | Decision Support Systems | 3 |
| | INSY 554 | Information Assurance and Security | 3 |
| | INSY 532 | Business Process Management | 3 |
| | INSY XXX | Elective II | 3 |
| | INSY 552 | Senior Project II | 3 |
| | Semester Total | | 18 |

16.2 Extension Program

| <i>Year</i> | <i>Semester I</i> | | |
|-----------------------|------------------------------|---|----------------|
| <i>I</i> | <i>Course No</i> | <i>Course Title</i> | <i>Cr.HrS.</i> |
| | MATH 203 | Mathematics I | 4 |
| | INSY 201 | Introduction to ICT | 4 |
| | FLEN 201 | Basic writing skills | 3 |
| | | | |
| | <i>Semester Total</i> | | <i>11</i> |
| | <i>Semester II</i> | | |
| | <i>Course No</i> | <i>Course Title</i> | <i>Cr.HrS.</i> |
| | MATH 204 | Mathematics II | 4 |
| | FLEN 202 | English for Communication I | 3 |
| | INSY 212 | Fundamentals of Programming | 4 |
| | | | |
| | <i>Semester Total</i> | | <i>11</i> |
| | <i>Semester III</i> | | |
| <i>Course No</i> | | | |
| CEED 201 | Civic and Ethical Education | 3 | |
| PHIL 201 | Introduction to Logic | 3 | |
| <i>Semester Total</i> | | <i>6</i> | |
| <i>Year</i> | <i>Semester I</i> | | |
| <i>2</i> | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> |
| | | | |
| | INSY 331 | Structured Systems Analysis and Design | 3 |
| | INSY 313 | Data structure and Algorithm Analysis | 3 |
| | FLEN 301 | English for Communication II | 3 |
| | <i>Semester Total</i> | | <i>9</i> |
| | <i>Semester II</i> | | |
| | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> |
| | INSY 311 | Object Oriented Programming | 4 |
| | INSY 322 | Fundamentals of Database Management Systems | 3 |
| | INSY 232 | Computer Architecture and Organization | 4 |
| | | | |
| | <i>Semester Total</i> | | <i>11</i> |
| | <i>Semester III</i> | | |
| <i>Course No</i> | | | |
| ACCN 211 | Principles of Accounting – I | 3 | |
| PSYC 201 | General Psychology | 3 | |
| <i>Semester Total</i> | | <i>6</i> | |
| | <i>Semester I</i> | | |

| <i>Year</i> | | | | |
|-------------|----------------------------|--|------------------------------|-----------|
| 3 | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> | |
| | INSY 312 | Internet Programming I | 3 | |
| | INSY 431 | Operating Systems | 4 | |
| | STAT 301 | Introduction to Probability and Statistics | 3 | |
| | INSY 433 | Object Oriented System Analysis and Design | 3 | |
| | | | <i>Semester Total</i> | 13 |
| | <i>Semester II</i> | | | |
| | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> | |
| | ECON 203 | Micro Economics | 3 | |
| | INSY 421 | Advanced Database Management Systems | 3 | |
| | INSY 411 | Internet Programming II | 3 | |
| | INSY 423 | Introduction to Information Storage and Retrieval | 3 | |
| | | | <i>Semester Total</i> | 12 |
| | <i>Semester III</i> | | | |
| | <i>Course No</i> | | | |
| | MAEN 215 | Introduction to Entrepreneurship and small Business Management | 3 | |
| | INSY 452 | Information Systems Project Management | 3 | |
| | | | <i>Semester Total</i> | 6 |

| <i>Year</i> | <i>Semester I</i> | | | |
|-------------|----------------------------|--|------------------------------|-----------|
| 4 | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> | |
| | INSY 441 | Data Communication and Computer Network | 4 | |
| | INSY 412 | Visual Programming | 4 | |
| | MAEN 422 | Organizational Behavior | 3 | |
| | | | <i>Semester Total</i> | 11 |
| | <i>Semester II</i> | | | |
| | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> | |
| | INSY 442 | Systems and Network Administration | 3 | |
| | INSY 414 | Introduction to Artificial Intelligence | 3 | |
| | INSY 422 | Multi Media Systems | 3 | |
| | INSY 553 | E-Commerce | 3 | |
| | | | <i>Semester Total</i> | 12 |
| | <i>Semester III</i> | | | |
| | <i>Course No</i> | | | |
| | INSY 551 | Internship | 3 | |
| | INSY 432 | Management of Information Systems and Services | 3 | |
| | | | <i>Semester Total</i> | 6 |

| <i>Year</i> | <i>Semester I</i> | | |
|-----------------------|------------------------------------|--|----------------|
| 5 | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> |
| | INSY 555 | Senior Project I | 3 |
| | INSY XXX | Elective I | 3 |
| | INSY 532 | Business Process Management | 3 |
| | INSY 444 | Computer Maintenance and Technical Support | 3 |
| | <i>Semester Total</i> | | 12 |
| | <i>Semester II</i> | | |
| | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> |
| | INSY 502 | Information and Society | 3 |
| | INSY 534 | Decision Support Systems | 3 |
| | INSY XXX | Elective II | 3 |
| | INSY 552 | Senior Project II | 3 |
| | <i>Semester Total</i> | | 12 |
| | <i>Semester III</i> | | |
| | <i>Course No</i> | <i>Course Title</i> | <i>Cr.Hrs.</i> |
| | LEAD 501 | Leadership Skills | 3 |
| INSY 554 | Information Assurance and Security | 3 | |
| <i>Semester Total</i> | | 6 | |

17. Course Descriptions and Course Objectives

17.1 Major Courses

Course Title: Introduction to Information and Communication Technology
Course Number: INSY201
Credit Hour: 4
Prerequisite: None

Course Description

This course provides an overview of Information and Communication Technology as an introduction. Topics include the development of computers, data representation, logical organization of a computer system, computer software, computer hardware, computer networking and communication, problem solving using computers, operating systems (single and multi-user) and the windows environment. Moreover the course discusses components of information systems and their type. This course will be supported by practical laboratory sessions where students are exposed to hands-on experience in using computers. Specifically they will work on Microsoft Windows operating system followed by office applications (like MS-Word, MS-Excel) and other useful software tools and applications.

Course Objectives

On completion, students will be able to;

- Explain what IT and ICT are and how they are used as tool for development
- Understand the components of modern technological infrastructures such as relevant hardware, software, networks, telecommunications and internet systems
- Discuss what information system is and its types
- Know how to use Microsoft Windows operating systems
- Use Microsoft applications and software

Course Contents:

Chapter 1. Introduction to Information and Communication Technology

- 1.1 Data, Information, Knowledge & Wisdom
- 1.2 Definition of IT
- 1.3 Purpose of IT
- 1.4 IT Devices
- 1.5 Information system
- 1.6 Application & Impact of IT

Chapter 2. Components of Computer system

- 2.1. Hardware
- 2.2. Software

Chapter 3. Number system and computer System Arithmetic

- 3.1 Number systems

3.2 Binary, Octal & Hexadecimal Number System

3.3 Basic Arithmetic operations

Chapter 4. Computer System Architecture

4.1 Evaluation of Computers & Performance

4.2 System Buses

4.3 Internal & External Memory

4.4 Input/output

4.5 Operating system

Chapter 5. Digital Gates

5.1. Definition of basic gates

5.2. Diagrammatical Representation of gates

5.3. Mathematical Representation of logical gates

5.4. Boolean Algebra

Chapter 6. Networking & Data Communications

6.1 Basic Concepts

6.2 Network Service Applications

6.3 Types of Networks

6.4. Network Hardware and Communication Channels

6.5. Network Operating Systems: Protocol and Communication Control

6.6. Network Architecture

Chapter 7. ICT and Society

7.1. The Information Superhighway

7.2. Issues in ICT and National Development

7.3. ICT and the Future

7.4. Ethical Issues in ICT

Laboratory Sessions

- ◆ MS-DOS and Ms-Windows Operating Systems
- ◆ Word Processing Basics
- ◆ Basics of Spreadsheet Applications
- ◆ Basics of MS-PowerPoint

Method of Teaching

Assignment, class works, and group work, Project works

Assessment:

| | |
|---------------------------------|------|
| ◆ Quizzes and Tests | 30% |
| ◆ Assignments with Presentation | 25% |
| ◆ Attendance | 5% |
| ◆ Final Exam | 40% |
| ◆ Total | 100% |

Text Book:

Shelly, Cashman and Vermatt, Discovering Computers 2004/2003/2002, Thomson Course Tech., 2004/2003/2002. [6]

References :

1. Rainer, Turban & Potter, Introduction to Information Systems, John Wiley & Sons, 2007,
2. June Jamrich Parsons and Dan Oja, Computer Concepts, 5th edition, Thomson Course Tech., 2004
3. Williams, Sawyer and Hutchinson, Using Information Technology, 3rd edition, McGrawHill, 1999
4. Zimmerman, Information Technology Applications, 2007, Thomson Course Tech.
5. Keyboarding & Information Processing, 1997, South Western Educational Publishing

Course Title: Computer Architecture&Organization
Course Number: INSY242
Credit Hour: 4
Prerequisite: Introduction to Information Communication Technology

Course Description

This course introduces students to basic computer organization and architecture concepts. It covers: number systems, Boolean algebra, digital logic circuits and their design, simple machine architecture, genealogy of microprocessors, von Neumann architecture, the system bus model, data representation and manipulation, organization of instruction sets and program execution, microprocessor organization, memory organization, organization of input and output subsystems, I/O interface; instruction set design philosophies, parallel processing, symmetric multiprocessing and clustering; case study of at least two microprocessor families and other components of computing system.

Course Objectives

At the end of the course students will be able to:

- Understand the basic structure and operation of a digital computer.
- Analyze arithmetic units including the algorithms & implementation
- Describe the structure of instruction sets and their effect on registers and memory contents
- Explain ways of communicating with I/O devices and standard I/O interfaces.
- Explain hierarchical memory systems including cache memories and virtual memory.

Course Contents:

Chapter 1. Number Systems and Data Representation

- 1.1. Number Systems: binary, octal and hexadecimal numbers
- 1.2. Complements: 1's and 2's complement
- 1.3. Fixed Point Representation, Floating Point Representation
- 1.4. Alphanumeric Code
- 1.5. Error Detection Code

Chapter 2. Digital logic Circuits

- 2.1. Logic Gates: AND, OR, NOT, NAND, XOR
- 2.2 Boolean Algebra
- 2.3 Analysis and Design
- 2.4 Combinational Circuits: Half Adder, Full Adder, Decoders and Encoders, Multiplexers
- 2.5 Sequential Circuits: Flip-Flops,

Chapter 3. Register Transfer and Micro operations

- 3.1 Register Transfer Language (RTL)
- 3.2 Register Transfer
- 3.3 Bus and Memory Transfers
- 3.4 Arithmetic Micro Operations, Logic Micro Operations
- 3.5 Shift Micro Operations
- 3.6 Arithmetic Logic Shift Unit

Chapter 4. Basic Computer Organization and Design

- 4.1 Registers, common bus system, I/O devices, ALU, CU, RAM
- 4.2 Computer Instructions
- 4.3 Instruction code format
- 4.4 Instruction set completeness
- 4.5 Design of the Basic Computer

Chapter 5. Programming the Basic Computer

- 5.1 Machine Language
- 5.2 Assembly Language, The Assembler
- 5.3 Program Loops
- 5.4 Programming Arithmetic and Logic Operations
- 5.5 Subroutines
- 5.6 Input-Output Programming

Chapter 6. Micro Programmed Control

- 6.1 Micro instruction format
- 6.2 Address sequencing
- 6.3 Micro program example

Chapter 7. Input-Output and Memory organization

- 7.1 Peripheral Devices
- 7.2 Input-Output Interface
- 7.3 Asynchronous Data Transfer
- 7.4 Memory Organization
- 7.5 Types of Memory: main, auxiliary, associative, cache, virtual
- 7.6 Memory Management Hardware

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|--------------------|-------------|
| ◆ Quizes and Tests | 35% |
| ◆ Assignments | 20% |
| ◆ Attendance | 5% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Morris M. Mano, Computer Systems Architecture, 3rd Ed., Prentice Hall

References:

1. Andrew S. Tanenbaum, Structured Computer Organization, 5th ed., 2006, Pearson Education Inc.
2. M. Mano & Kime C., Logic & Computer Design Fundamentals, 3rd Ed., 2004, Prentice-Hall Inc.
3. John Hennessey & David Patterson, Computer Architecture: A Quantitative Approach, 4th Ed., 2003, Morgan Kauffman Publishers
4. William Stallings, Computer Organization & Architecture: Designing for Performance, 5th Ed., 1996, Prentice-Hall Inc.

Course Title: Fundamentals of Programming
Course Number: INSY 212
Credit Hour: 4
Prerequisite: Introduction to Information and Communication Technology

Course Description:

Introduction to programming principles and concepts focusing on structured programming and problem solving will be dealt with in this course. The structured programming approach will be practically experienced through the C++ programming language. Problem solving techniques, simple algorithm design, testing and debugging techniques, and documentation standards will also be covered. The C++ syntactical elements and their semantics will also be learnt for the student. This includes but is not limited to elementary operators, data types, control structures, user-defined and library functions, basic input/output, sequential files, arrays and structures. This course will be appropriate for students with little or no programming experience but those that are comfortable using computers with modern GUI-based operating systems. These concepts will be demonstrated in laboratory session.

Course Objectives:

On completion of this course students will be able to:

- Apply the knowledge of writing, editing, compiling, running and debugging programs
- Explain and demonstrate steps involved in program development
- Apply the simple C++ data types, operators, and constructs in programs and explain how they are represented in the machine
- Apply the structured programming constructs: sequence, selection and iteration in solving problems
- Perform elementary interactive input and output operations;
- Apply, define and use the structured C++ data types: arrays, strings, structures in applications drawn from mathematics, the sciences, and other areas;
- Use text files to record and retrieve information in elementary applications;
- Demonstrate the ability of writing well-documented and user-friendly programs of short to medium length.

Course Contents:

Chapter 1: Introduction

- 1.1 Overview of computers and computer organization
- 1.2 Generations of programming languages- machine language, assembly language, and high level language.
- 1.3 Procedural, Structured and object oriented programming paradigms
- 1.4 Problem solving process and algorithm designing and modeling logic (Using flow chart)
- 1.5 Mechanics of creating a program and basics of typical C++ environment
- 1.6 History of C and C++

Chapter 2: Basics of C++

- 2.1 The parts of a C++ program
- 2.2 A brief look at functions
- 2.3 Concepts of data type, variables and constants
- 2.4 Operations, expressions and statements

Chapter 3: Program flow control constructs

- 3.1 Sequencing
- 3.2 Branching /conditioning
- 3.3 Iterating /looping
- 3.4 Other control statement

Chapter 4: Arrays and structures

- 4.1 Declaring, accessing and processing arrays
- 4.2 String manipulation using arrays
- 4.3 Multidimensional arrays
- 4.4 User define data types (UDT)

Chapter 5: Functions

- 5.1 What is a function
- 5.2 Declaring and defining a function
- 5.3 Function parameters and arguments
- 5.4 Calling by value and reference parameters
- 5.5 Recursion

Chapter 6: Pointer

- 6.1 Pointer variables and declarations
- 6.2 Pointer operators, expression, arithmetic
- 6.3 Calling functions by reference (using pointers)
- 6.4 Strings and pointers
- 6.5 Relationship between pointers and arrays

Chapter 7: File Operations (File I/O)

- 7.1 Stream classes
- 7.2 Writing to and reading from files
- 7.3 File access methods and modes
- 7.4 Command line arguments

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|---|------------|
| ◆ Continuous Assessments(quizzes, tests, assignments and class attendance) | 40% |
| ◆ Project | 20% |
| ◆ Final Exam | <u>40%</u> |
| ◆ Total | 100% |

Text Book

Joel Adams & Larry Nyhoff, An Introduction to Computing, 3rd ed., Prentice Hall, 2003

References

1. .Walter Savitch, Problem Solving with C++, 5th & 6th editions, Pearson Education Inc.,2005/2009
2. Steve Oualline, Practical C++ Programming, O'Relly& Associates Inc., 2nd Edition, 1997
3. Steven Prata, C++ Primer Plus, 3rd ed., Sams Publishing,1998
4. D.S Malik, C++ Programming: Program Desing including Data Structures, Thomson Course Tech., 3rd ed., 2007
5. Tony Gaddis, Stardard Version of Starting Out with C++, 4th ed., 2005
6. Deitel&Deitel, C++ How to Program, Prentice Hall, 1994

Course Title: Fundamentals of Database Management Systems
Course Number: INSY 322
Credit Hour: 3
Prerequisite: Structured System Analysis and Design

Course Description

This course exposes the students to the design and implementation of database systems. Topics covered include the definition of a database and benefits of database systems, architecture for database systems, implications of file organization and storage structures, hierarchical and network data models, relational data model, data structures and integrity rules, database design, relational algebra and relational calculus. In the lab session student will write SQL statements to practice DDL and DML.

Course Objectives

At the end of the course students will be able to:

- Explain the different models of database,
- Design models from specifications and interpret them into relational tables,
- Write statements for data creation and manipulation purposes,
- Distinguish and use relational model and relational algebra,
- Use SQL statements to create and manipulate databases and their relations

Course Contents:

Chapter 1. Introduction

- 1.1 Manual file handling systems and limitations
- 1.2 Traditional File based systems
- 1.3 Database approach
- 1.4 Functions and Components of DBMS
- 1.5 Database Development Lifecycle
- 1.6 Roles in database design environment
- 1.7 Database Languages (DDL, DML)

Chapter 2. Relational Model

- 2.1 Terminology
- 2.2 Data models
- 2.3 Relational Constraints
- 2.4 Relational languages and views
- 2.5 Relational DBMS

Chapter 3. Conceptual Database Design – E-R modeling

- 3.1 Basic concepts of E-R model
- 3.2 Structural constraints
- 3.3 Problem with E-R models
- 3.4 Enhanced E-R models

Chapter 4. Logical Database Design

- 4.1 Normalization
- 4.2 Purpose of normalization
- 4.3 Functional dependencies
- 4.4 Different Normal Forms
- 4.5 Process of normalization

Chapter 5. Physical Database Design

- 5.1 Design considerations
- 5.2 Physical database design process
- 5.3 Database design and implementation for relational databases

Chapter 6. Query Languages

- 6.1 Relational algebra
- 6.2 Relational calculus
- 6.3 Structured Query Languages

Chapter 7. Advanced Database Concepts

- 7.1 Integrity and security
- 7.2 Client-server systems
- 7.3 Distributed systems
- 7.4 Data warehousing

Chapter 8. Introduction to SQL (Lab)

- 8.1 Int. to MS-Access(Tables, and Queries)
- 8.2 Transaction and Query Processing
- 8.3 Writing SQL commands
- 8.4 Data definition
- 8.5 Data manipulation
- 8.6 Basic SQL commands and their usage

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments and class attendance) | 40% |
| ◆ Project | 20% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Connolly T.M. and Carolyn E. Begg. 2009. Database Systems: A Practical Approach to Design, Implementation and Management, 5e.

Reference:

1. RamezElmasri, Shamkant B. Navathe. 2006. Fundamentals of Database Systems(5th ed). ISBN-10 0321369574.
2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan. 2005. Database System Concepts (5th ed).
3. Database Processing. Fundamentals, Design and Implementation by David M. Kroenke

4. Ronald R. P. & Ryan K.S., Teach Yourself SQL in 24 Hours, 2nd Ed., SamsPublishing, 2000
5. Peter Rob & Carlos Coronel, Database Systems: Design Implementation and Management, 3rd Ed., Thomson Course Tech. 1997
6. Richard T. Watson, Data Management: Database and Organizations, 4th Ed., Jhon Wiley & Sons, 2004
7. David M. Kroenke et el, Database Processing, Prentice Hall, 11th Ed, 2010

Course Title: **Advanced Database Management Systems**
Course Number: **INSY 421**
Credit Hour: **3**
Prerequisite: **Fundamentals of Database Systems**

Course Description:

This course focuses on the client or user-side of database systems. It extends the knowledge in the previous course by adding concepts of database management and use. Topics to be covered are file and record organization, basics of query optimization, transaction management and database security. The course includes an overview of advanced database systems such as Object-Oriented and Object-Relational databases, active databases, deductive databases, multimedia and spatial databases, and distributed databases. Current trends in DBMS are also covered. This course is supported by a series of laboratory sessions on DB management, administration and security issues.

Course Objectives

On completion of this course students will be able to:

- Explain basics of query optimization.
- Understand transaction processing concepts.
- Understand database recovery techniques.
- Identify database security issues.
- Manage a database system.
- Understand how to organize and use databases effectively
- Identify the related issues with object-relational databases.

Course contents:

Chapter 1: Transaction Management and Concurrency Control

- 1.1 Transactions
- 1.2 Transaction Support
- 1.3 Concurrency Control
- 1.4 Database recovery

Chapter 2: Query Processing and Optimization

- 2.1 Overview
- 2.2 Query Processing steps
- 2.3 Query Decomposition
- 2.4 Optimization Process
- 2.5 Approaches to Query Optimization
- 2.6 Transformation Rules
- 2.7 Implementing relational Operators
- 2.8 Pipelining

Chapter 3: Database Integrity, Security and Recovery

- 3.1 Integrity
- 3.2 Security

Chapter 4: Distributed Database Systems

- 4.1 Concepts of Distributed Databases
- 4.2 Distributed Database Design

4.3 Distributed Query Processing and Transaction Management

Chapter 5: Data warehousing and Data Mining Techniques

5.1 Data Warehousing

5.2 Data Mining

Chapter 6: Object Oriented DBMS

6.1 Object Oriented Concepts (Abstraction, Encapsulation, and Information hiding)

6.2 Drawbacks of relational DBMS

6.3 OODBMS issues

6.4 OO Database Design and Implementation

6.5 OO Data modeling and EER diagramming

6.6 Objects and Attributes

6.7 Object Identity

6.8 Object Definition and Query Languages

Method of Teaching

Lectures, Assignments, Class group discussions, projects works

Assessment:

| | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities) | 40% |
| ◆ Project | 20% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Abraham Silberschatz, Henry F. Korth, S. Sudarshan. 2005. Database System Concepts (5th ed).

References:

1. RamezElmasri, Shamkant B. Navathe. 2006. Fundamentals of Database Systems(5th ed). ISBN-10 0321369574.
2. Database Processing. Fundamentals, Design and Implementation by David M. Kroenke
3. Connolly T.M. and Carolyn E. Begg.. Database Systems: A Practical Approach to Design, Implementation and Management, 5th Ed., 2009
4. MichealOtey& Paul Conte, SQL Server 7 Developer’s Guide, McGrawHill, 1999
5. Steven Bobrowski, Oracle7 Server Technology Concepts Manual, 1992
6. Peter Rob & Carlos Coronel, Database Systems: Design Implementation and Management, 3rd Ed., Thomson Course Tech. 1997
7. David M. Kroenke et el, Database Processing, Prentice Hall, 11th Ed, 2010

Course Title: **Structured System Analysis & Design**
Course Number: **INSY 331**
Credit Hour: **3**
Prerequisite: **Introduction to Information Communication Technology**

Course Description

This course covers information systems theory. Topics include types of information systems; roles in system development; phases in project management, tools used to manage system development projects, system development life cycle; information systems development methodologies and models.

Course objectives:

After completing the course the students will be able to:

- Define systems terminologies;
- Analyze information systems;
- Manage information system projects
- Know about the various aspects and components of System Life Cycle in a CBIS.
- Identity & determine user requirements using different methods;
- Apply and use different analysis and modeling techniques in real-life information system projects;
- Analyze and design small and medium scale systems

Course Contents:

Chapter 1. Introduction to Systems " Analysis and Design:

- 1.1 The Systems Development Environment
- 1.2 Definition of a System
- 1.3 Systems Thinking
- 1.4 Information Systems
- 1.5 Information Systems Building Blocks
- 1.6 Systems Development Life Cycle
- 1.7 Succeeding as a Systems Analyst

Chapter 2. Managing Information Systems Project

- 2.1 Initiating and Planning a project
- 2.2 Representing and Scheduling Project Plans

Chapter 3. Information System Development:

- 3.1 Methodologies
- 3.2 Approaches and Modeling
- 3.3 Tools

Chapter 4. Determining System Requirements

- 4.1 Traditional Methods
- 4.2 Modern Methods
- 4.3 Radical Methods

Chapter 5. Structuring System Requirements: Process Modeling

- 5.1 System Concepts for Process Modeling
- 5.2 Data Flow Diagrams
- 5.3 Constructing Process Models

Chapter 6. Structuring System Requirements: Data Modeling

- 6.1 System Concepts for Data Modeling
- 6.2 Logical Data Modeling
- 6.3 E-R Modeling
- 6.4 Constructing Data Models

Chapter 7. Structuring System Requirements: Logic Modeling

- 7.1 Structured English
- 7.2 Decision Tables
- 7.3 Decision Trees

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, Group works, etc) | 40% |
| ◆ Project | 20% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Hoffer, J. A. and J. F. George, Joseph S Valacich. Modern System Analysis and Design. 5th edition, 2007, 648 p. ISBN-10 0132240769.

References:

1. Shelly, Cashman, & Rosenblatt, System Analysis & Design, 4th Ed., 2001, ThomsonCourse Tech.
2. Kendall & Kendall, System Analysis & Design, 3rd Ed., 1995, Prentice-Hall Inc.
3. J.C.Wetherbe& N.P. Vitalari, System Analysis & Design: Best Practices, 4th Ed., West Publishing Company
4. J.W. Seatzinger et el., System Analysis & Design in a Changing World, Thomson Course Tech.
5. John G. Burch, System Analysis, Design & Implementation, 1992, Division of South Western Publishing

Course Title: Object Oriented Programming
Course Number: INSY 311
Credit Hour: 4
Prerequisite: Fundamentals of Programming

Course Description

This course is designed to provide the fundamental theories, principles and techniques of object oriented programming. Topics to be dealt with are: classes, objects, data abstraction, encapsulation, information hiding, overloading, inheritance, polymorphism, exceptions handling. This course gives students the opportunity to work on the Java programming language during the practical session.

Course Objectives:

Upon completion of the course students will be able to:

- Compare and contrast the two known programming paradigms structural programming and Object Oriented Programming,
- Understand basic object oriented concepts such as object, class, abstraction, hierarchy, modularity and encapsulation,
- Successfully carry out a project on the edit-compile-run cycle of software development in an appropriate software development environment,
- Use Java to implement and experiment on object oriented program development techniques and principles.

Course Contents:

Chapter 1: Fundamental Programming Structures in Java

- 1.1. Java Fundamentals
- 1.2. Data Types and Literals
- 1.3. Variables
- 1.4. Constants
- 1.5. Assignments
- 1.6. Initializations
- 1.7. Operators
- 1.8. Strings
- 1.9. Control of Flow
- 1.10. Wrapper Classes
- 1.11. Arrays

Chapter 2: Classes and Objects in Java

- 2.1. Classes & Objects
- 2.2. OOP Principles
- 2.3. Instantiation
- 2.4. Encapsulation
- 2.5. Specialization
- 2.6. Instance Variables
- 2.7. Class Variables
- 2.8. Constructors
- 2.9. Instance Methods
- 2.10. Class Methods

- 2.11. Method Overloading
- 2.12. The this keyword
- 2.13. Passing and returning objects
- 2.14. Garbage Collection in Java

Chapter 3: Object Design and Programming with Java

- 3.1. Abstraction
- 3.2. Inheritance
- 3.3. Polymorphism
- 3.4. Method Overriding
- 3.5. Associations
- 3.6. Delegation

Chapter 4: Java Interfaces

- 4.1. Purpose of Interfaces
- 4.2. When to use them
- 4.3. Interface Declaration
- 4.4. Implementing an Interface
- 4.5. Interface Inheritance
- 4.6. Interfaces and Abstract Classes

Chapter 5: Java Exception Handling

- 5.1. Why Exceptions
- 5.2. Standard Exception Handling Options
- 5.3. Exception Class Hierarchy
- 5.4. Checked vs. Unchecked Exceptions
- 5.5. Catching an Exception:- try and catch blocks
- 5.6. Methods Which Throw Exceptions:- the throws clause
- 5.7. Handling vs. Declaring Exceptions
- 5.8. System Exceptions vs. Application Exceptions
- 5.9. Writing Custom Exceptions

Chapter 6: Java Input/output API (Optional)

- 6.1. Streams & Files
- 6.2. Input & Output Streams
- 6.3. File Streams
- 6.4. Object Streams
- 6.5. Object Serialization
- 6.6. Readers & Writers
- 6.7. The Java New I/O (NIO) API

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment

- | | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 40% |
| ◆ Project | 20% |
| ◆ Final Exam | <u>40%</u> |
| ◆ Total | 100% |

Text Book:

Deitel&Deitel, Java How to Program, Pearson Education Inc., 3rd/8th ed.,
1999/2010

References:

1. Bruce Eckel, Thinking in Java, Prentice Hall, 2nd Ed., 2000
2. Edith Au et al., Java Programming Basics, Pencom Systems Inc. 1996
3. Micheal C. Daconta, Java for C/C++ Programmers, Jhon Wiley & Sons Inc., 1996
4. KenethLitwak, Pure Java 2, Sams Publishing Inc., 2000
5. Sanders K. E. and Andy Van Dam. 2005. Object-Oriented Programming in Java: A Graphical Approach, Preliminary Edition

Course Title: Data Structures and Algorithms Analysis
Course Number: INSY313
Credit Hour: 3
Prerequisite: Fundamentals of Programming

Course Description:

This course focuses on the study of data structures, algorithms and program efficiency. It helps students not only write correct and efficient programs but also produce efficient processor time utilization and memory usage. Topics include analysis of time and space requirement of algorithms; program efficiency improving techniques; abstract data types such as linked lists, stacks, queues, and trees; simple searching and sorting algorithms; and advanced sorting algorithms. By making object oriented programming a prerequisite it is intended to deliver this course using object orientation. Students will practice these concepts in the lab session.

Course objectives:

At the end of the course students will be able to:

- Understand and explain the theories and principles of data structures and algorithms
- Grasp the essence of writing efficient programs
- Comprehend how to create abstract data structures
- Analyze program space and time complexity
- Write efficient programs using the most appropriate data structure and algorithms
- Discuss the workings and pros and cons of sorting and searching algorithms

Course Contents:

Chapter 1. Introduction

- 1.1 Programming Strategies
- 1.2 Introduction to data structures & algorithms
- 1.3 Measuring Complexity of an algorithm

Chapter 2. Time Complexity of Known Algorithms

- 2.1 Simple sorting algorithms (Bubble Sort, Insertion Sort, Selection Sort)
- 2.2 Simple Search algorithms (Sequential Search, Binary Search)

Chapter 3. Data Structures and Applications

- 3.1 Abstract Data Types (ADT)
- 3.2 Revision on structures, classes, pointers and arrays
- 3.3 Linear ADTs (Linked List, Stacks and Queue)
- 3.4 Non-linear ADT (Trees)

Chapter 4. Advanced Sorting and Searching Algorithms

- 4.1 Shell sort,
- 4.2 Quick Sort,
- 4.3 Heap sort,
- 4.4 Merge Sort,
- 4.5 Hashing

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|--|-------------|
| ◆ Continuous assessment (quiz, Assignments, class works, class activity etc) | 40% |
| ◆ Project | 20% |
| ◆ Final exam | <u>40%</u> |
| ◆ Total | 100% |

Text Book:

Richard & Lewis, Fundamentals of Object Oriented Programming & Data Structures in Java, 2000, Cambridge University Press

References

1. Robert L. Kruse & Alexander J. Ryba, Data Structures & Program Design in C++, 1999, Prentice Hall
2. Frank M. Carrano & Janet J. Prichard, Data Abstraction & Problem Solving with Java, 2001, Addison Wisely Longman Inc.
3. Dietel & Dietel, Java How to Program, 11th Ed., 2010, Prentice Hall
4. Principles and Concepts of Data Structures, Schuam's Outline Series

Course Title: Information Systems Project Management
Course Number: INSY 452
Credit Hour: 3
Prerequisite: Structured Systems Analysis and Design

Course Description

The purpose of this course is to provide students with practical experience in the management of development projects. It deals with planning, organizing, staffing, controlling, and directing projects. It puts major emphasis on project planning, techniques for monitoring and controlling projects, quantitative methods and tools, and leadership issues in project management. A term project that involves the development of a project plan for a non-trivial project will be required. Students in this course will gain this experience by serving with a development team of IS and IT students. Each team will have approximately an equal number of IS and IT students.

Course Objectives:

At the completion of the course the student will be able to:

- Define a project goal and create the project charter
- Create a feasibility plan and establish a priority list
- Determine strategy and budget dollars
- Work with management and define their role
- Determine project expenses including estimated required hours
- Delegate responsibilities and manage project schedules
- Implement a project management approach to tracking progress and implementing
- Develop a project management system to track costs and schedule quality testing

Course Contents:

Chapter 1. Introduction to Project management

- 1.1 Project Management Basics
- 1.2 Role of a Project Manager
- 1.3 Project Resources
- 1.4 Phases of Software Project

Chapter 2. Introduction to PERT/CPM

- 2.1 Work Breakdown Structure
- 2.2 Network diagramming
- 2.3 Critical Path
- 2.4 PERT Probability
- 2.5 Crashing

Chapter 3. Software Effort Estimation

- 3.1 Estimations Basics
- 3.2 LOC Method
- 3.3 Function Points
- 3.4 Activity Based Estimation
- 3.5 COCOMO
- 3.6 Uncertainty in estimation

Chapter 4. Project Planning

- 4.1 Management
- 4.2 Risk
- 4.3 Configuration
- 4.4 Quality Assurance
- 4.5 Induction
- 4.6 Schedule

Chapter 5. Configuration Management

- 5.1 Configuration Management Basics
- 5.2 Code Management
- 5.3 Change Management
- 5.4 Information Management

Chapter 6. Quality Assurance in Projects

- 6.1 Quality Basics
- 6.2 Quality Assurance Activities in Projects

Chapter 7. Human Factors and Leadership

- 7.1 Motivation
- 7.2 Communication
- 7.3 Handling Difficult People
- 7.4 Leadership
- 7.5 Team Dynamics

Chapter 8 Progress Tracking & Control

- 8.1 Progress Assessment & Reporting
- 8.2 Scope Management
- 8.3 Risk Mitigation

Chapter 9. Project Closeout & support

- 9.1 Project post-mortem
- 9.2 Collection of re-usable Components
- 9.3 Draw lessons from the good & bad Practices of the project
- 9.4 Project-End Audit
- 9.5 Organize Knowledge Repository
- 9.6 Processes, Standards & Guidelines
- 9.7 Training

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 35% |
| ◆ Project | 25% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Jack R. Meredith, Scott M. Shafer, Sutton, Margaret Sutton. 2007. Information Systems Project Management. ISBN-10 0975914650. 336 p.

References:

1. Phillips, Joseph. 2004. IT Project Management: On Track from Start to Finish, 2nd ed. McGraw Hill, Osborne.
2. Lock, Dennis. 2007. Project Management, 9th ed. Gower.
3. Baine, Kenneth R. 2004. Integrated IT Project Management- A Model-Centric Approach. Artech House, Boston.

Course Title: Internet Programming I
Course Number: INSY 312
Credit Hour: 3
Prerequisite: Fundamentals of Programming

Course Description:

This course teaches the fundamental principles and techniques for designing and developing effective dynamic websites. Topics include: hand-coding pages with HTML; styling text and content with CSS; adding dynamic features with client-side scripting techniques and advanced mark-up techniques using DHTML.

Course Objectives:

After successful completion of the course students will be able to:

- Develop web pages using HTML,
- Apply CSS to structure the layout of web pages,
- Use JavaScript to make a web page interactive and dynamic,
- Apply DOM to create dynamic pages,
- Design, develop and complete a short dynamic web site development project

Course Contents:

Chapter 1. Introduction to Internet and Webpage

- 1.1. Terminology
- 1.2. Overview of web development tools
- 1.3. Architecture of the Internet and WWW
- 1.4. HTTP/HTTPS protocols

Chapter 2. HTML: Hypertext Markup Language

- 2.1. Basic HTML Tags
- 2.2. HTML: Tables and Lists
- 2.3. HTML Forms
- 2.4. HTML Multimedia

Chapter 3. CSS: Cascading Style Sheets

- 3.1. CSS Basics
- 3.2. CSS Syntax
- 3.3. Linking CSS to HTML
- 3.4. CSS Styling

Chapter 4. JavaScript Programming

- 4.1. Introduction to JavaScript
- 4.2. Running the JavaScript
- 4.3. Working with Variables and Data
- 4.4. Operators and Expressions
- 4.5. Working with Conditional Statements
- 4.6. Arrays, loops and Functions
- 4.7. JavaScript Objects
- 4.8. Form Processing and Validation

Chapter 5. DOM

- 5.1. Introduction to DOM
- 5.2. Dynamic HTML(DHTML)

Method of Teaching:

Lectures supported by laboratory practice, project, tutorials and assignments

Assessment:

| | | |
|----------------------------|-----------|------|
| ◆ Continuous Assessment | | |
| ○ Assignments and project | | 20 |
| ○ Practical Lab Exam | | 15 |
| ○ Tests | | 25 |
| ◆ <u>Final Examination</u> | <u>40</u> | |
| Total | | 100% |

Text Book:

Shelly Cashman Series, HTML Complete Concepts and Techniques, 3 rd Edition, 2005, ISBN 0-619-25502-1

References:

1. Deitel&Deitel, Internet & World Wide Web How to Program, , 4th ed., 2009 Pearson Education Inc.[1]
2. Jennifer Niederst, Web Design in A Nutshell, 1999, O'Relly& Associates inc., [2]
3. Linda & William Weinman, Creative html design.2, 2001, New Riders
4. Laura Lemay, Teach Yourself Web Publishing with HTML in 14 Days, 1995, Sams.net Publishing
5. Don Gosselin, JavaScript Comprehensive, 2000, Thomson Course Tech.
6. Eric M. & William J., Dynamic HTML in Action, 2nd Ed., 1999, Microsoft Press
7. Peter den Haan et el., Beginning JSP 2: From Novice to Professional, 2004, APress
8. Chris Goode et el., Beginning ASP.NET 1.0 with Visual Basic.NET,2002, Wrox Press Ltd.
9. Susane Clark et el., VBScript Programmer's Reference, 1999, Wrox Press Ltd.
10. Danny Goodman, Dynamic HTML – The Definitive Reference, 2002, O'Relly
11. Danny Goodman, JavaScript Bible, 3rd Ed., IDG Books Worldwide Inc.,

Course Title: Internet Programming II
Course Number: INSY 411
Credit Hour: 3
Prerequisite: Internet Programming I and Fundamentals of Database Management Systems

Course Description

Internet ProgrammingII is a continuation of the course Internet Programming I. Topics include: client-side programming using scripting languages (JavaScript, VBScript); server-side programming (CGI, JSP, ASP, PHP);web-based database application development, java applets, XML XHTML.

Course Objectives:

At the end of the course students will be able to:

- understand the internet and World Wide Web
- comprehend essence and application of client-server web-based information systems
- analyze, design and develop dynamic web-based commercial systems

Course Content:

Chapter 1: Client side scripting

- 1.1. Cascading style sheets (CCS)
- 1.2. Client side scripting in JavaScript
- 1.3. Dynamic HTML(DHTML)
- 1.4. The document object model (DOM)
- 1.5. Browser compatibility issues

Chapter 2: Server side programs

- 2.1. Configuration of Apache web server
- 2.2. The common gateway interface (CGI)
- 2.3. Programming with CGI using C/C++
- 2.4. Server side scripting with PHP
- 2.5. Session control

Chapter 3: XML

- 3.1. The extensible markup language(XML)

Chapter 4: Introduction to JSP

- 4.1. What is JSP?
- 4.2. Your First JSP
- 4.3. Directives
- 4.4. Declarations
- 4.5. Scriptlets
- 4.6. Expressions

Chapter 5: Advanced internet programming

- 5.1. Java applets
- 5.2. Java server page (JSP)
- 5.3. Data manipulation in JSP

Assessment :

| | |
|---------------------------------------|-------------|
| ◆ Assignments, term paper and project | 20% |
| ◆ Practical Lab Exam | 15 % |
| ◆ Tests(at least four) | 25% |
| ◆ Final Examination | <u>50%</u> |
| Total | 100% |

Method of Teaching:

Lectures supported by laboratory practice, project, tutorials and assignments

Text Book:

Deitel&Deitel, Internet & World Wide Web How to Program, , 4th ed., 2009
Pearson EducationInc

References:

1. Don Gosselin, JavaScript Comprehensive, 2000, Thomson Course Tech.
2. Peter den Haan et el., Beginning JSP 2: From Novice to Professional, 2004, APress
3. Chris Goode et el., Beginning ASP.NET 1.0 with Visual Basic.NET,2002, Wrox Press Ltd.
4. Susane Clark et el., VBScript Programmer's Reference, 1999, Wrox Press Ltd.
5. Danny Goodman, Dynamic HTML – The Definitive Reference, 2002, O'Relly
6. Danny Goodman, JavaScript Bible, 3rd Ed., IDG Books Worldwide Inc.

Course Title: Business Process Management
Course Number: INSY 532
Credit Hour: 3
Prerequisite: Organizational Behavior

Course Description

Business Process Management (BPM) is directed at achieving three outcomes crucial to a performance-based, customer-driven firm: 1) clarity on strategic direction, 2) alignment of the firm's resources, and 3) increased discipline in daily operations. The course provides an overview of BPM as both a management discipline and as a set of enabling technologies, and establishes the foundation for the courses that follow. The main focus of this course is on both understanding and designing business processes. Students will learn how to identify, document, model, assess, and improve core business processes. Students will be introduced to process design principles. The way in which information technology can be used to manage, transform, and improve business processes is discussed. Students will be exposed to challenges and approaches to organizational change, outsourcing, and inter-organizational processes.

Course Objectives:

At the end of the course students will be able to:

- Understand the key terms and concepts in BPM
- Describe the major methodologies and techniques for implementing BPM
- Model business processes
- Assess business processes performance
- Design business process improvements
- Grasp the role and potential of IT to support business process management
- Comprehend how to support and manage business process change
- Know different approaches to business process modeling and improvement
- Capture the challenges and risk concerning business process outsourcing
- Use basic business process modeling tools
- Simulate simple business processes and use simulation results in business process analysis

Course Contents:

Chapter 1: Understanding Business Process Management

- 1.1. Brief history of business process management
- 1.2. Defining Business Process Management
- 1.3. Driver of BMP
- 1.4. Management of BPM Improvement
- 1.5. What are the critical success factors in a BPM project?

Chapter 2: Framework or Model of Business Process Management Implementation

- 2.1. Step 1: Organization strategy phase
- 2.2. Step 2: Process architecture phase
- 2.3. Step 3: Launch pad phase
- 2.4. Step 4: Understand phase
- 2.5. Step 5: Innovate phase

- 2.6. Step 6: People phase
- 2.7. Step 7: Develop phase
- 2.8. Step 8: Implement phase
- 2.9. Step 9: Realize value phase
- 2.10. Step 10: Sustainable performance phase

Chapter 3: Managing and Sustaining Business Process Change

- 3.1. Project management
- 3.2. People change management
- 3.3. Leadership

Chapter 4: Information Technology Role And Potential In Business Process Management

- 4.1. It and Employee
- 4.2. It and Customer
- 4.3. It and Business

Assessment:

| | |
|---------------------------|-----|
| ◆ Team Project: | 15% |
| ◆ Individual Assignments: | 20% |
| ◆ Tests and Quizzes | 20% |
| ◆ Final Exam: | 40% |

Text Book:

Weske, M. 2007. Business Process Management: Concepts, Languages, Architectures, Springer, ISBN-10: 3540735216

References:

1. Jeston, John and J. Nelis. 2008. Business Process Management, 2nd edition:
2. Practical Guidelines to Successful Implementations. Butterworth-Heinemann.

Course Title: Information and Society
Course Number: INSY 502
Credit Hour: 3
Prerequisite: Introduction to ICT

Course Description:

This course covers information, information overload, computers and their use, the social system, and societal evolution. Topics include social impacts of information, physiological, psychological, cultural, and social interaction; the information economy (occupational changes, impacts on the work force, telecommuting), information economics (market structure and pricing, etc...), E-governance (computerization and democratization), computer crimes and security mechanisms, property rights, privacy, surveillance, and censorship. Issues such as regulation, the digital divide and ethics will be considered.

Course Objectives:

After this course students will be able to:

- Discuss the impact of information on society
- Understand e-governance
- Realize and use ergonomics of computers
- Recognize ethical issues regarding information technology and adhere to the same

Course Content:

Chapter 1: Basic Concepts

- 1.1. Data, Information, Knowledge, Wisdom, and Information Hierarchies
- 1.2. Information Societies and Information Sectors
- 1.3. Information Theory
- 1.4. Cybernetics and Entropy
- 1.5. Information Overload
- 1.6. Social System
- 1.7. Information Demand and Human Evolution
- 1.8. Economical aspects of Information Society
- 1.9. Globalization
- 1.10. Information rich Vs. information poor Society

Chapter 2: The Physiological, Psychological, SOCIAL impacts of computer USE

- 2.1. Technology and Human needs
- 2.2. Ergonomics
- 2.3. The Physiology of Human/Computer Interaction
- 2.4. The Psychology of Human/Computer Interaction
- 2.5. Social Interactions among Computer Users
- 2.6. Computer Aided Conversation and The problem of Trust
- 2.7. Social Integration in Electronic Networks
- 2.8. Changes caused by Computer Technology Application to Work

Chapter 3: The Information economy: from manufacturing to knowledge production

- 3.1. Introduction
- 3.2. The Social Structure of Work
- 3.3. Industrial Change in the Information Society

Chapter 4: Information property, privacy, and control

- 4.1. Information as property
- 4.2. Protecting Information Products
- 4.3. Intellectual property in Ethiopian Case
- 4.4. Computer Crime
- 4.5. Computer Security
- 4.6. Computer Security Measures
- 4.7. Privacy Issues vis-à-vis ICT
- 4.8. Information Policy
- 4.9. Political aspect of Information society

Chapter 5: Ethics in an information society Information Society

- 5.1. Basic Concepts: Responsibility, Accountability, and liability
- 5.2. Ethical Analysis
- 5.3. Candidate Ethical principles
- 5.4. The Moral Dimensions of Information Systems
- 5.5. Information Rights: Privacy and Freedom in a Information Society
- 5.6. Property Rights: Intellectual Property
- 5.7. Accountability, Liability and Control

Method of Teaching:

Lecture, reading assignment, group discussions

Assessment:

| | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments with presentation) | 60% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Textbook:

Ethics in Engineeringby Martin and Schinzinger, 1996.

References:

1. Fuchs, Christian. 2008. Internet and society: social theory in the information age. Routledge, New York
2. Sally Wyatt; ebrary, Inc.; et al. 2000. Technology and in/equality questioning the information society. Routledge, London.

Course Title: **Systems and Network Administration**
Course Number: **INSY 442**
Credit Hour: **3**
Prerequisite: **Data Communication and Computer Network and Operating Systems**

Course Description

This course covers software-specific concepts of systems and computer network administration. Topics include network basics, server management; network security; and network configuration and management. This course provides a practical problem solving approach to the field of Windows NT/2000, UNIX, and Novell Netware.

Course Objective:

After completing this course the students will be able to:

- Administer systems and network services.
- Design networks effectively
- Create user and group accounts, profiles, and setting permissions,
- Implement group and Network security policies
- Identify network connectivity and solve network problems by troubleshooting
- Audit, backup and recovery, and monitoring resources,
- Use operating systems such as Microsoft Windows NT, UNIX, etc.

Course Contents:

Chapter 1: Overview on Networking (... continued from previous course)

- 1.1. Fundamentals of communication
- 1.2. Computer network related topics (topology, access methods)
- 1.3. Protocols (OSI, TCP/IP reference models)
- 1.4. Network devices
- 1.5. Identify Different Network cabling and Cable Testing

Chapter 2: Network Operating Systems

- 2.1. Fundamentals of Operating Systems
- 2.2. Types of Operating System
 - 2.2.1. Desktop Operating Systems
 - 2.2.2. Network Operating Systems
- 2.3. File Systems

Chapter 3: Network Services and network administration

- 3.1. Network Services
 - 3.1.1. Directory Service
 - 3.1.2. Mail Service
 - 3.1.3. Web Service
 - 3.1.4. FTP Service
 - 3.1.5. DNS Service
 - 3.1.6. DHCP Service
- 3.2. Tasks of system administration
- 3.3. Network operating systems administration
- 3.4. Basic elements of Microsoft Windows Server 2008

Chapter 4: Server types and Installing Servers and Services

- 4.2. Types of Server
 - 4.2.1. Domain Controllers
 - 4.2.2. Member Servers
- 4.3. Server Hardware Components
- 4.4. Server Hardware Requirements
- 4.5. Preparing for Installation
 - 4.5.1. Partitioning Disk
 - 4.5.2. Formatting Disk
- 4.6. The Boot process in MS-Windows Operating Systems
- 4.7. Install and configure Windows Server 2008
- 4.8. Install and configure Microsoft Active Directory Services
- 4.9. Install and configure Windows Server 2008 network components
 - 4.9.1. Installing Active Directory, DNS and DHCP Services
 - 4.9.2. Joining Clients to Domains
- 4.10. Install and configure new hardware with Windows Server 2008
- 4.11. Install and configure Microsoft Internet and Information Services (IIS) Manager

Chapter 5: Group Policy Object (GPO)

- 5.1 Group policy Management
- 5.2 Group policy Object Application

Chapter 6: File and Print Service

- 6.1 File service
- 6.2 Print service
- 6.3 Quota Management
- 6.4 Backup and Restore

Chapter 7: Network security

- 7.1 What is Network Security
- 7.2 Developing a Network Security Policy
- 7.3 Threats to Network Security
- 7.4 Implementing Security measures
- 7.5 Applying Patches and Upgrades

Teaching Methods:

Lectures, practical laboratory exercises using Microsoft Windows Server Operating System, assignments, and projects works.

Assessment:

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 45% |
| ◆ Project | 15% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Mark Burgess, Principles of Network and Systems Administration, 2nd edition, 2004

References:

1. Michael Aubert, MCSE Microsoft Windows Server 2003 Active Directory Enhanced, 2006, Thomson Course Tech.
2. Andrew S. Tanenbaum, Computer Networks, 3rd Ed., 1996, Prentice Hall
3. Patrick Ciccarelli& Christina Faulkner, Networking Foundations, 2004, Sybex Inc.
4. Melissia Craft et el., Network+: Exam Prep, 1999, The Coriolis Group
5. John Ray, Using TCP/IP, 1999, Que Corporation
6. William Stallings, Data and Computer Communications, 2004, Prentice Hall
7. J. F. Kurose and K. W. Ross: Computer Networking: A Top-Down Approach to the Internet (3rd ed), Pearson Education, Inc., 2005.[0]

Course Title: Operating Systems
Course Number: INSY340
Credit Hour: 4
Prerequisite: Data Structure and Algorithm Analysis

Course Description:

The course provides an introduction on the basic functions of operating systems. Topics to be covered provide an overview of operating systems including their history, evolution and philosophy. The course then covers the process concept; the thread concept; scheduling: basic concepts, scheduling criteria, scheduling algorithms; inter-process communication, process synchronization, the critical section problem, semaphores, monitors, classical synchronization problems; deadlocks and avoidance, prevention. Memory management includes physical and virtual memory, swapping, allocation, paging, segmentation; file systems, access methods, directory structure, file system implementation, disk space management, Input/output, principles of I/O hardware and software; security: authentication and encryption. This course is accompanied by a practical laboratory sessions where students will be exposed to hands-on experience in manipulating the internals of operating systems possibly using a LINUX distribution like UBUNTU, FEDORA or open SUSE

Course Objectives:

At the end of the course students will be able to:

- Describe common inter-process communication and synchronization methods
- Explain common process scheduling algorithms
- Understand the problem of deadlocks
- Conceptualize the implementation of virtual memory as used in computer systems and some of the critical problems that need to be considered
- Describe the main issues of operating systems in handling I/O devices
- Grasp the goals of file system design and the ways in which several operating systems meet these goals
- Discuss the need for security in computer systems in the historical context and discuss several threats and methods of overcoming those threats

Course Contents:

Chapter 1. Introduction

- 1.1. What is an Operating system
- 1.2. History of Operating system
- 1.3. Operating System Categories
- 1.4. Operating system concepts (process, files, system calls, shell)
- 1.5. Operating system structures (Monolithic, layered, virtual machines, client/server)

Chapter 2. Process Management

- 2.1. Process model, implementation of process
- 2.2. Inter - process communication & synchronization
- 2.3. classical IPC problems
- 2.4. Process scheduling

Chapter 3. Memory Management

- 3.1. Memory management techniques
- 3.2. Virtual Memory
- 3.3. Page Replacement Algorithms

Chapter 4. I/O Management

- 4.1. Principles of I/O hardware: I/O devices, device controllers, Direct Memory Access
- 4.2. Disk Management: Scheduling algorithms

Chapter 5. File System Management

- 5.1. File Concepts: naming, structure, types access, attributes, operations
- 5.2. Directories: hierarchies, path names, operations

Chapter 6. Security and Protection

- 6.1. The Security Problem,
- 6.2. Computer-Security,
- 6.3. Program Threats and Classifications,
- 6.4. System and Network Threats,
- 6.5. Cryptography as a Security Tool,
- 6.6. User Authentication,
- 6.7. Implementing Security Defenses,
- 6.8. Firewalling to Protect Systems and Networks.

Chapter 7. Network Operating Systems

- 7.1. Window Server 2010
- 7.2. Linux Administration

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 45% |
| ◆ Project | 15% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Andrew S. Tanenbaum. 2007. Modern Operating Systems (3rded). ISBN-10 0136006633.

References

1. AviSilberschatz et el., Applied Operating System Concepts, 1st Ed., 2000, John Wiley & Sons, Inc.
2. William Stallings, Operating Systems: Internals & Design Principles, 5th Ed., 2005, Prentice Hall
3. AviSilberschatz et el., Operating System Concepts, 6th Ed., John Wiley & Sons, Inc.
4. Grant Taylor, Linux Complete, 1999, Sybex Inc.
5. Mark J. Rochkind, Advanced Linux Programming, 1995, Prentice Hall
6. Michael Tischer, PC Intern Systems Programming, 1992, Abacus-Developer's Series
7. Christopher Negus, Linux Bible, 2005, Wiley Publishing Inc.,

Course Title: Data Communication and Computer Networks
Course Number: INSY 441
Credit Hour: 3
Prerequisite: Introduction to Information Communication Technology

Course Description

This course introduces students to the basic principles and techniques of data communication in computer networks. Topics covered are: application of computer networks; overview of the OSI and TCP/IP reference models, network types; network protocols; analog and digital signals, modulation; guided and unguided transmission media, encoding, multiplexing, synchronous and asynchronous communication, transmission impairments, connecting devices, error detection and correction, multiple access methods; network topologies; network security; network management and an introduction to wireless networks.

Course Objectives:

Upon completion of the course students will be able to:

- Understand basic communication concepts and the advantages of Computer Networks
- Understand different Network Protocols and Standards
- Apply the OSI-ISO 7 layer reference model and the TCP/IP model to practical networks
- Analyze different types of computer Networks and network Architectures
- Identify the various LAN Devices.
- Select communication components and networks for particular applications

Course Content:

Chapter 1: Overview of Data communication and Networking

- 1.3 A communication Model
- 1.4 Data Communication and Its Components
- 1.5 Computer Networks and their types
- 1.6 Reference Models (OSI Reference Model and TCP/IP Protocol Suite)

Chapter 2: Introduction to Data Transmission and Encoding Techniques

- 2.1 Analog Vs Digital Data and Signals
- 2.2 Encoding Techniques

Chapter 3: Local Area Networks and Components

- 3.1 LAN topology and Transmission Media
- 3.2 Repeaters, Hubs, Bridges, 2 Layer Switches

Chapter 4: Data Link Control protocols

- 4.1 Flow Control
- 4.2 Error Control

Chapter 5: Point to Point Access and Multiple Access Protocols

- 5.1 PPP Stack
- 5.2 Random Access Control Protocols
- 5.3 Controlled Access Protocols

5.4 Channelization

Chapter 6: Local Area Networking Technologies and Physical Addresses

6.1 Ethernet and Ethernet Standards

6.2 Token Ring

6.3 Physical Addresses

Chapter 7: Introduction to Internetworking and Network Layer Protocols

7.1 Internetworking

7.2 IP, ARP and RARP

7.3 IP and Classful Addressing

Chapter 8: Transport and Application Layer Protocols

8.1 TCP and UDP

8.2 HTTP, DNS, FTP, SMTP

Method of Teaching:

Lectures, Lab demonstration, and Assignments

Assessment:

- | | |
|--|-----|
| ◆ Quizzes, Assignments, Class activities and attendances | 60% |
| ◆ Final Exam | 40% |

Text Book:

B. A. Forouzan. 2006. Data Communications and Networking (4thed). ISBN-10
0071254420

References:

1. Andrew S. Tanenbaum, Computer Networks, 3rd Ed., 1996, Prentice Hall
2. Patrick Ciccarelli& Christina Faulkner, Networking Foundations, 2004, Sybex Inc.
3. Melissia Craft et el., Network+: Exam Prep, 1999, The Coriolis Group
4. John Ray, Using TCP/IP, 1999, Que Corporation
5. Todd Lammle, CCNA Study Guide, 4th Ed., Sybex Inc.
6. Todd Lammle, CCNA Study Guide, 2nd Ed., Sybex Inc.
7. Networking Essentials Plus, Microsoft Press, ISBN:157231902x

Course Title: Object Oriented Systems Analysis and Design
Course Code: INSY 433
Credit Hour: 3
Pre-Requisite: Structured System Analysis and Design and Object Oriented Programming

Course Description:

Introduction to Object Technology; Principles of Modeling, Principles of Object Orientation; systems development using the object technology; Modeling; principles of modeling; requirements gathering and modeling using use case; techniques of modeling static and dynamic aspects of systems; finding classes and objects; Interaction Diagrams – sequence and collaboration diagrams; Class Diagrams; object diagram; activity diagram; State chart diagrams; component diagram; deployment diagram. An individual and/or team project involving reports and walk-through in systems analysis and design is also a major component of this course using CASE tools.

Course Objectives:

Upon completion of this course, students will be able to:

- Understand fundamental concepts and object-oriented techniques of systems analysis and design.
- Analyze problems through the development of structural, behavioral and state-chart models
- Capture user requirements through use-case modeling
- Examine use-cases to analyze and build an understanding of the problem
- Develop design models that reflect OO solutions
- Transfer best OO practices into projects in the workplace

Course Content:

Chapter 1. Introduction

- 1.1. System Analysis and Design
- 1.2. Structured versus Object Oriented Approaches
- 1.3. Benefits and Drawbacks of Object Orientation
- 1.4. Understanding the basics of Object Oriented Concepts
- 1.5. Object Standards

Chapter 2. Requirements Definition

- 2.1. What is requirement?
- 2.2. Fundamental Requirement Gathering techniques
- 2.3. Essential use case modeling
- 2.4. Essential user Interface prototyping
- 2.5. Domain modeling with CRC
- 2.6. Developing a supplementary specification

Chapter 3. Object Oriented System Analysis

- 3.1. Writing System Use case
- 3.2. Sequence Diagrams
- 3.3. Conceptual Modeling: Class Diagrams
- 3.4. Activity Diagramming
- 3.5. User Interface Prototyping

Chapter 4. Object Oriented Design

- 4.1. Principles of System Design
- 4.2. Class Type Architecture
- 4.3. Class Modeling
- 4.4. State chart modeling
- 4.5. Collaboration Modeling
- 4.6. Component Modeling
- 4.7. Deployment Modeling
- 4.8. Relational Persistence Modeling
- 4.9. User Interface Design

Chapter 5. Testing

- 5.1. Testing and Validation
- 5.2. Test Design Techniques
- 5.3. Types of tests
- 5.4. Integration testing
- 5.5. System test and acceptance test

Teaching Methods:

Lectures, group discussion and presentation

Assessment:

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 30% |
| ◆ Project | 30% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text book:

Scott w. ambler. The Object Primer 3rd ed. University of Cambridge press.2004

References:

1. Ian Sommerville, Software Engineering, 5th Ed., 1996, Addison Wesley
2. Grady Booch et al., The UML User Guide, 12th Ed., 2004, Addison Wesley
3. Pierre-Alain Muller, Instant UML, Wrox Press
4. Stephen R. Schach, Classical & Object Oriented Software Engineering, 4th Ed., 1999, McGraw Hill
5. Roger Pressman, Software Engineering: A Practitioner's Approach, 4th Ed.,1997,McGraw-Hill.

Course Title: Introduction to Information Storage and Retrieval
Course Number: INSY 423
Credit Hour: 3
Prerequisites: Fundamentals of Data Base Management Systems and Data Structure and Algorithm

Course Description:

This course includes: introduction to Information Storage and Retrieval (Definition, components, kinds of Information Retrieval Systems, the retrieval process etc.); automatic text operation and automatic indexing (term selection, term weighting, etc); data and file structure for information retrieval (flat files, inverted files, signature files, PAT trees, and graphs), Retrieval Model (Boolean Model, Vector Based Retrieval Model, Probabilistic Retrieval Model); Evaluation of Information retrieval systems (Precision Recall, fallout, generality, E-measure, harmonic mean, User based evaluation etc.), techniques for enhancing retrieval effectiveness(including relevance feedback, query reformulation, thesauri etc), query languages, query operations, string manipulation and search algorithms, document classification and clustering; and current Issues in IR etc.

Course Objectives:

After successful completion of the course, students will be able to:

- Understand the processes of information storage and retrieval;
- Explain modern information retrieval models;
- Design, develop and evaluate Information Retrieval systems;
- Understand evaluation issues in IR;
- Discuss current research issues in IR

Course Contents:

Chapter 1: Introduction to Information Storage and Retrieval

- 1.1. Definition
- 1.2. Components
- 1.3. Kinds of Information Retrieval Systems
- 1.4. Retrieval process

Chapter 2: Automatic Text Operation And Automatic Indexing

- 2.1. Term selection
- 2.2. Term weighting

Chapter 3: Data And File Structure For Information Retrieval

- 3.1. Flat files,
- 3.2. Inverted files
- 3.3. Signature files
- 3.4. PAT trees

Chapter 4: Retrieval Model

- 4.1. Boolean model
- 4.2. Vector based retrieval model
- 4.3. Probabilistic retrieval model

Chapter 5: Evaluation Of Information Retrieval Systems

- 5.1. Relevance judgment

- 5.2. Effectiveness
- 5.3. Recall and Precision
- 5.4. Fallout

Chapter 6: Techniques For Enhancing Retrieval Effectiveness

- 6.1. Relevance feedback
- 6.2. Query reformulation
- 6.3. Thesauri

Chapter 7: Query Languages and Query Operation

- 7.1. String manipulation and search algorithms
- 7.2. Document classification and clustering

Chapter 8: Current Trends and Developments

- 8.1. Hyper Text and Hyper Media
- 8.2. Multimedia IR
- 8.3. Digital Libraries
- 8.4. Intelligent Retrieval Systems

Teaching Methods:

Lectures, group discussion and presentation

Assessment:

| | |
|---------------------|------------|
| ◆ Assignment | 20% |
| ◆ Project | 20% |
| ◆ Tests and Quizzes | 20% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text:

1. R. Baeza-Yates, B. Ribeiro-Neto. (1999). *Modern Information Retrieval*, ACM Press, Addison-Wesley: New York
2. R. R. Korfhage. (1997). *Information Storage and Retrieval*, John Wiley & Sons: New York

References:

1. G. Salton and M.J. McGill. (1983). *Introduction to Information Retrieval*. McGraw-Hill: New York
2. C.J. van Rijsbergen (1979). *Information Retrieval*. London: Butterworths
3. K. Sparck Jones and P. Willett (1997). *Readings in Information Retrieval*. Morgan Kaufmann: San Francisco
4. I.H. Witten, A. Moffat and T.C. Bell (1999). *Managing gigabytes: Compressing and Indexing Documents and Images*. Morgan Kaufmann: San Francisco
5. Cleveland, D. B., & Cleveland, A. D. (2001). *Introduction to indexing and abstracting*. 3rd ed. GreenwoodVillage, CO.: Libraries Unlimited. ISBN 978-1563086410
6. *Indexes: A chapter from The Chicago manual of style, 15th edition*. (2003). Chicago: University of Chicago Press. ISBN 978-0226104065

Course Title: Visual Programming
Course Number: INSY 412
Credit Hour: 4
Prerequisite: Object Oriented Programming

Course Description

This course covers the use of Visual Basic programming to customize programs or applications. Topics include visual programming concepts and tools; introduction to Visual Basic.Net; component development and reusability, designing and customizing forms, modeling tools, multi-user programming techniques; programming with DDE, OLE and calling procedures in DL and doing projects using VB.net. A project will call for designing and writing a program for a practical application.

Course Objectives:

Students should develop an understanding of the Visual Basic language and learn how to write programs including designing and customizing reports.

Course Contents:

Chapter 1: Rapid Application Development

- 1.1 Introduction
- 1.2 What is RAD?
- 1.3 Why use RAD?
- 1.4 Characteristics of RAD
- 1.5 Summary

Chapter 2: Introduction to Visual Basic

- 2.1 Welcome to Visual Basic
- 2.2 Developing an Application in Visual Basic
- 2.3 Visual Basic Concepts
- 2.4 The Integrated Development Environment
- 2.5 Your First Visual Basic Application

Chapter 3: Forms and Intrinsic Controls

- 3.1 Forms
- 3.2 Intrinsic Controls

Chapter 4: Language Concepts

- 4.1 Introduction
- 4.2 Syntax and Semantics
- 4.3 Components of a Program
- 4.4 Array
- 4.5 Procedures: Subroutines and Functions
- 4.6 Scope and life time of Variables
- 4.7 Program Control statements
- 4.8 Library Functions
- 4.9 Working with Files

Chapter 5: Database Programming

- 5.1 Introduction
- 5.2 Database Structure and Terminology
- 5.3 Database Connection with ADO Technology

5.4 Database Queries with SQL

Chapter 6: Component Development and Reusability

6.1 Introduction

6.2 Programming with Objects

6.3 ActiveX Components

6.4 ActiveX Controls

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|--|------------|
| ◆ Continuous assessment (quiz, Assignments, class works, class activity etc) | 30% |
| ◆ Project | 30% |
| ◆ Final exam | <u>40%</u> |
| ◆ Total | 100% |

Textbook:

Michael Halvorson, Microsoft Visual Basic 2008: Step by Step, Microsoft Press, ISBN-10 0725625379

Reference:

1. Stephens R., Visual Basic 2008 Programmers Reference, 2008, ISBN-10 0470182628. 1248 p.
2. Julia Case Bradley & Anita C. Millspough, Programming in Visual Basic. NET,4th Ed., 2003, McGrawHill
3. Mike Gunderly, ADO & ADO.Net Programming, 2002, Sybex Inc.,
4. Visual Basic 2008: Programmer's Reference, Wiley Publishing

Course Title: Internship
Course Number: INTE551
Credit Hour: 3
Prerequisite: Completing Third Year

Course description

This course supplements the student's academic program with experiential education. The internship experience will be guided by a learning contract outlining expectations and academic components. The internship will occur during the summer break between the third and fourth year. The intern will work regular work days for two and a half months. Students are expected to concentrate on the major ICT areas of the organization they are engaged with during their attachment.

Objectives

During the time of the internship students are expected to fully engage themselves with all aspects of the organizational ICT infrastructures, systems and services including but not limited to:

- How organizations manage their ICT needs and requirements
- Network systems being used and maintained, technologies(both hardware and software) used, services delivered, etc
- Operating systems and other software tools used
- The strategy deployed to respond organizational software needs
- Web systems and technologies being used
- Users expectations and satisfactions of the ICT services
- How end users' requests are managed
- Detailed knowledge of organizational ICT infrastructures and strategies
- New ways of doing things in ICT

A intern is expected to be effortful and successful in establishing all-rounded personality addressing the aforementioned areas and they are also encouraging to find a specific area of interest to explore more deeply. For instance, after exploring the overall ICT infrastructures and systems of an organization a student may become more interested concentrate his/her effort either in the networking systems or software development or web development and services of the organization.

Assessment

- | | |
|---|-----|
| ◆ Daily reports and accomplishments | 40% |
| ◆ Special project accomplished and report delivered | 40% |
| ◆ Executive interview (viva voce) | 10% |
| ◆ Job performance evaluation | 10% |

Course Title: E-Commerce
Course Number: INSY 553
Credit Hour: 3
Prerequisite: Internet Programming II

Course Description

This course introduces students to the emerging theories and practices of E-commerce strategies. Strategies associated with both sides of the electronic commerce world are included: E-commerce solutions for existing companies and E-business concept development for venture startups. Students will study the role of E-systems and the internet in commerce. Application of Information Technology in business is also part of the class.

Course Objectives

Up on completion of this course, students will:

- be familiar with the different ways that electronic commerce can add business value to an organization;
- be able to list and analyze the key decision faced by an organization when establishing or updating a web presence;
- have an appreciation of the principles and use of key technologies applied in electronic commerce;
- understand the processes involved in doing business electronically; and
- be able to design and develop a good quality web sites for business purposes

Course Content:

Chapter 1: An Overview of E-Commerce

- 1.1. Introduction
- 1.2. E-Commerce Defined
- 1.3. Major Forces that Shape the Digital Era\ The Major Drivers of the New Economy
- 1.4. Perspectives of Electronic E-Commerce
- 1.5. Eight Unique Features of E-Commerce
- 1.6. Forms of E-Commerce
- 1.7. Advantages and Limitations of E-Commerce

Chapter 2: Business Model for E-Commerce

- 2.1. Introduction
- 2.2. Eight Key Elements of a Business Model
- 2.3. E-Business Model Based on Relationship of Transaction Parties
- 2.4. Major Business-to-Consumer Business Models
- 2.5. Major Business-to-business (B2B) models for E-Commerce
- 2.6. Business Models in Emerging E-Commerce area
- 2.7. E-Business Models Based on the relationship of transaction types

Chapter 3: E-Commerce Payment Systems

- 3.1. Introduction
- 3.2. Properties of e-money
- 3.3. Types of E-Commerce Payment Systems

Chapter 4: E Commerce Marketing Concepts

- 4.1. Online Consumers: The Internet Audience and Consumer behavior
- 4.2. B2C and B2B E-Commerce Marketing and Branding Strategies
- 4.3. Customer Retention: Strengthening the Customer Relationship
- 4.4. Net Pricing Strategies
- 4.5. Channel Strategies: Managing Channel Conflict:
- 4.6. Advertising as a strategy in digital economy
- 4.7. Online Market Research- Knowing Your Customer

Chapter 5: Ethical, Social and Political Issues In E-Commerce

- 5.1. A model for organizing the issues
- 5.2. The basic ethical concepts: Responsibility, Accountability, and Liability
- 5.3. Analyzing Ethical Dilemmas
- 5.4. Ethical Principles
- 5.5. Privacy and Information Rights
- 5.6. The concept of privacy
- 5.7. Intellectual Property Rights
- 5.8. Copyright
- 5.9. Patents
- 5.10. Trademarks
- 5.11. Public Safety and Welfare

Teaching Method:

- Lecture, Group Discussion, Computer Lab, Project Work

Text Book:

Erfan Turban et. al., Electronic Commerce, 2008, Pearson Education, ISBN-10: 132243305

References:

1. Fundamentals of E-Business /commerce (2002) Pearson Edu. Inc. ISBN 0-536-81383-3
2. Tom &Kutnick Dale (2000). E-Enterprise: Business Models, Architecture & Components
3. Turban, Efraim (2003)Introduction to E-commerce
4. Mc Garvey and Campanelli, 2006, Start Your Own E-Business, ISBN-10: 193215674
5. E-Business and e-Commerce Infrastructure: Technologies Supporting the e-Business Initiative. AbhijitChaudhury, Jean-Pierre Kulboer. Mc-Graw Hill Companies, 2002. ISBN: 0-07-247875-6.

Assessment:

| | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 35% |
| ◆ Project | 25% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Course Title: Decision Support Systems
Course Number: INSY 534
Credit Hour: 3
Prerequisite: Introduction to Probability and Statistics and Introduction to ICT

Course Description:

This course will explore the fundamentals of decision and decision making, design and the development of DSS designed to support decision making tasks in organizations. The course reviews models of individual and organizational decision making, types of decision Support Systems, knowledge management issues, and provides an overview of a number of existing and emerging techniques that support decision making such as statistical models, expert systems, artificial intelligence, executive support systems, Group decision support systems, data warehousing and data mining. Methodologies for the development and implementation of DSS are also discussed.

Course Objectives:

- Understand the basics of decision and decision making
- Know the design and development of decision support system and emerging techniques that support decision making
- Know the types of decision support systems, and techniques that support decision support systems such as statistical models, expert systems, group decision support systems, data mining and warehousing.
- Practical skill in designing and developing a decision support system
- Know how to write small decision support systems using previous programming knowledge

Course Content:

Chapter 1: Introduction to DSS

- 1.1 DSS Characteristics
- 1.2 Applications of Decision Support Systems
- 1.3 Capabilities of Decision Support Systems
- 1.4 Components of Decision Support Systems
- 1.5 Benefits of Using DSS Systems
- 1.6 Evaluating the Success/Failure of Decision Support Systems

Chapter 2: Human judgment and decision making

- 2.1 Individual and group decision-making
- 2.2 Heuristics and biases

Chapter 3: Organizational decision-making

- 3.1 Rational model
- 3.2 Bounded rationality

Chapter 4: Elements of a DSS/EIS

- 4.1 Collecting, querying, analyzing & reporting data;
- 4.2 Statistical analysis and decision-making;
- 4.3 MS/OR models, AI and Expert Systems

Chapter 5: Group Decision Support Systems

- 5.1 Participation in group decision-making,
- 5.2 GDSS research

Chapter 6: Developing DSS applications

- 6.1 Development tools and methodologies,
- 6.2 Eliciting knowledge,
- 6.3 End-user participation

Chapter 7: DSS in practice

- 7.1 Implementing DSS
- 7.2 Organizational innovation
- 7.3 Implementation failures

Method of Teaching:

Lecture, assignment, presentation and discussion

Assessment:

| | |
|-------------------|-----|
| ◆ Two assignments | 20% |
| ◆ Paper Work | 20% |
| ◆ Tests | 20% |
| ◆ Final Exam | 40% |

Text Book:

Wayne L.winston, Christopher zapper ,Data Analysis and Decision Making with Microsoft Excel, 2006,Thomson , S. Christian Albright,

References:

1. Marakas, George M. Decision Support Systems in the 21st Century, Second Edition. New Jersey. Prentice-Hall. 2002
2. Seref M H., et al. 2007. Developing Spreadsheet-Based Decision Support Systems. ISBN-10 0975914650.
2. Organization for Economic Cooperation and Development (OECD). 2005. Statistics, knowledge and policy: key indicators to inform decision making. OECD, Paris.
3. Nunamaker, JF. 1996. Information systems – decision support systems and knowledge based systems. IEEE Computer Society Press, Los Alamitos, CA.
4. Turban, E., Aronson,J.E., Decision Support Systems and Intelligent Systems- 7th Edition, Prentice-Hall, 2005.
5. Decision Support Systems: Concepts and Resources for Managers, by Daniel J. Power, 2002

Course Title: Computer Maintenance and Technical Support

Course Number: INSY 444

Credit Hour: 3

Prerequisite: Introduction to ICT

Course Description:

This course is designed to provide students with the fundamentals of configuring, installing, diagnosing, repairing, upgrading, maintaining, computers and their peripherals. The topics include: PC hardware configuration, preventative maintenance, customer interaction, virus protection, safety and networks and installation of operating systems and applications.

Course Objectives:

At the end of the course students will be able to:

- Apply standard safety procedures.
- Correctly operate appropriate tools, equipment, and materials
- Perform periodic maintenance on a computer workstations
- Demonstrate knowledge of computer components, i.e., power supplies, motherboards, memory, processors, hard drives, modems, and bus and port connections.
- Understand and install appropriate operating systems and drivers.
- Demonstrate knowledge of installation and maintenance of computer peripherals.
- Comprehend and troubleshoot basic computer networks.

Course Content:

Chapter 1: Manage time and to set priorities within the needs of the client or organization.

Identification of parts and proper usage of correct terminology of Computer Parts

1.1. Power Supply

1.2. Motherboard(CPU, Bios, Busses, Memory(RAM),Expansion slots)

1.3. Hard Drive

1.4. CD/DVD ROMs

1.5. USB Ports

1.6. CMOS

Chapter 2: Operation and types of mass storage devices.

2.1. SATA and eSATA, IDE,EIDE

2.2. Storage Configuration(Tracks , Sectors and FAT Table)

2.3. Solid State vs Magnetic

2.4. Optical Drives(CD, DVD, RW, Blu-Ray)

2.5. Removable Storage(Tape, Solid State (Flash drives, SD Cards, USB), Hot Swappable devices and non-hot swappable)

2.6. Partitioning and Formatting

Chapter 3: Types and characteristics of CPU's, their cooling mechanism

3.1. CPU Brands (AMD vs. Intel).

3.2. Core Types(Dual ,Triple , Quad)

3.3. Peripheral Devices(Keyboard, Mouse, Touch Screens,BioMetric Devices, Microphones, web cams, digital camera's

Chapter 4: Memory Types

- 4.1. DRAMM
- 4.2. SRAM
- 4.3. SDRAM
- 4.4. DDR/DDR2/DDR3
- 4.5. RAMBUS

Chapter 5: Operating Systems:

- 5.1. Overview of OS,
- 5.2. Types of OS,
- 5.3. Role of OS in working of Computers
- 5.4. Domain and Workgroup environment
- 5.5. Resource sharing in workgroup environment.

Chapter 6: Threats of Computer System

- 6.1. Software Treats (Viruses)
- 6.2. Hardware Treats

Chapter 7: Performance and maintenance

- 7.1. Freeing up disk space,
- 7.2. System Backup & Restoration ,
- 7.3. Conserving power on your computer, Scheduling tasks, Keeping Windows up-to-date,
- 7.4. partitioning, Defragmentation,
- 7.5. Security and Administration

Chapter 8: Servers

- 8.1. Windows Server (Domain Controller),
- 8.2. DHCP/DNS server
- 8.3. Web Server: IIS
- 8.4. Email Server: MS-Exchange
- 8.5. Outlook Express Proxy Server: ISA
- 8.6. Database Server: MS-SQL

Method of Teaching

Lecture supported by video clips, laboratory demonstration

Assessment:

- Continuous Assessment
 - Tests**30%**
 - Test 1 (From chapter 1 and 2).....15%
 - Test 2 (From chapter 3 and 4).....15%
 - Assignments**20%**
 - Assignment I (at the end of chapter 2).....10%
 - Assignment II (at the end of chapter 4)10%
 - Lab Exercises**15%**
 - PC Assembly.....5%
 - Software Installation10%
 - Operating System.....5%
 - Application Software5%

- Final exam.....35%
- Total100%

Text Book:

1. Jean Andrews, A+ Guide to Managing & Maintaining Your PC, 3rd ed., 2000, Thomson Course Tech., 2nd Ed.

References:

1. Stephen J. Bigelow, Troubleshooting, Maintaining, & Repairing PCs, 2nd Ed., 1999, McGraw Hill.
2. David Groth& Dan Newland, A+ Complete Study Guide, 2002, Sybex Inc.
3. Osborne, A+ Certification Study Guide, 3rd Ed., 2001, McGraw Hill.
4. David Groth, A+ Core Module Study Guide, Sybex Inc.
5. Peter Norton & John Goodman, Inside the PC, 7th Ed., 1997, Sams Publishing
6. Tom Badgett et el., A Guide to Operating Systems Troubleshooting & Problem Solving, 1999, Thomson Course Tech.
7. Stephen J. Bigelow, Troubleshooting & Repairing PC Drives & Memory Systems, 2nd Ed., 1998, McGraw Hill.
8. Will Train, PC Upgrading & Maintenance, 1997, Sybex Inc.

Course Title: Senior Project I
Course Number: INSY555
Credit Hour: 3
Prerequisite: Object Oriented System Analysis and Design, Advanced Database Management Systems and Internet Programming II

Course Description:

The purpose of this project is for students to practice what they have learned in classes from different courses by applying in a specific project they select. The student will select a topic in an application area, which must be approved by the Department of Information Systems, and write a project plan and then carry out the project from planning to design. The deliverables produced in this course are a proposal and analysis document.

Course Objectives:

The project gives students the opportunity to obtain, develop and demonstrate research skills in Information Systems

- Gather requirements using different requirement gathering methods
- Analyze and organize the requirements gathered
- Designing a solution for those needs
- Produce a proposal for new system
- Produce models of the new system using standard modeling tools
- Communicate and negotiate with the organization to convince the importance of the new system
- communicating efficiently within the group
- Organizing work / programming within a group
- Identifying and analyzing user needs

Assessment:

- | | |
|--|------|
| ◆ Progress reports evaluation by the advisor | 20% |
| ◆ Documentation | 40 % |
| ◆ Presentation | 20% |
| ◆ Questions answering | 20% |

Course Title: Senior Project II
Course Number: INSY 552
Credit Hour: 3
Prerequisite: Senior Project I

Course Description

This course is a continuation from Senior Project I, in total the course is based on what the students have done in Senior Project I of the course. In this course, students continue to progress in the project and produce an implementation documents. They are expected to implement the system and test if it works properly as per the design. In implementation, they write a code (in any language) for the application, create databases, produce different types of reports, create computer networks, and implement client server systems depending on their project type.

This course is aimed at helping students build up an understanding of how to develop a software system from scratch by guiding them through the development process and giving them the fundamental principles of system development

Course Objectives:

The project gives students the opportunity to obtain, develop and demonstrate software development skills.

- Write applications to simplify information processing form organization
- Design organizational IT systems including databases systems, computer networks, and web systems
- Apply different software testing techniques and methods
- Work in groups/team to develop information systems
- Communicating efficiently within the group
- Understanding coding

Assessment:

- | | |
|--|-----|
| ◆ Progress reports evaluation by the advisor | 20% |
| ◆ Functionality and non-functional features of the prototype | 40% |
| ◆ Demonstration | 20% |
| ◆ Questions and answering | 20% |

Course Title: Management of Information Systems and Services

Course Code: INSY432

Credit Hour: 3

Pre-Requisite: Structured System Analysis and Design

Course Description:

This course provides an introduction to internal and external management issues and practices in information organizations. Internal issues: organizational behavior, organizational theory, personnel, budgeting, planning. External issues: organizational environments, politics, marketing, strategic planning, funding sources.

Course Objectives:

Upon completion of this course, students will be able to:

- Explore organizational needs for information and how information systems meet those needs.
- Evaluate information technology acquisitions including:
 - Assessing the feasibility of alternative technology solutions.
 - Determining how the technology solution affects stakeholders.
 - Prioritizing system requirements and constraints.
 - Determining of the organization to build or buy the technology.
 - Determining resources needs for implementing the technology system.
 - Constructing a decision matrix for evaluating alternative technology systems.
 - Developing an implementation and post-implementation plan.
 - Creating the appropriate documentation needed to defend a technology acquisition to management.

Course content

Chapter 1: Introduction

1.1. Review of Information Systems

1.2. IS and Managerial Function

Chapter 2: Organization of information resource

2.1. Centralized Organization

2.2. Decentralized Organization

2.3. Hybrid/Federalism organization

Chapter 3: IS planning

3.1. The planning Process

3.2. The IS planning triangle

Chapter 4: Project Management

4.1. Overview of project

4.2. Project management Process

Chapter 5: Control processing

5.1. Policies and Practices

5.2. Verification procedurs

Chapter 6: Performance evaluation and Auditing

6.1. Performance parameters

6.2. Is Auditing

Chapter 7: Human Resource development

7.1. IS Personnel

7.2. Team Organization

Chapter 8: Information architecture and technology trend

Chapter 9: Recent trend and further direction of Information System management

9.1. E-Business Direction

9.2. Organization direction

9.3. Technical Infrastructure Direction

Teaching Methods:

Lecture, Discussion, Group/ Individual Assignments

Assessment:

| | |
|---------------------|-------|
| ◆ Theoretical Tests | 35% |
| ◆ Assignment | 25% |
| ◆ Final Exam | 40 %. |

Text Book:

McNurlin and Sprague, Information Systems Management in Practice, 7th Edition

References:

1. Robert K. Wysocki AND James Young Information Systems: Management Practices in Action (1990) Wiley; 1 edition
2. Laudon, Kenneth C. and Jane P. Laudon (2009), 11e, Management Information Systems: Managing the Digital Firm. 013607846X

Course Title: Multimedia Systems
Course Number: INSY532
Credit Hour: 3
Prerequisite: Data structure and Algorithm Analysis

Course Description:

Multimedia data has become an indispensable part of our daily life. It is also one of the critical applications in broad areas of use. In this course students will be introduced to the principles and current technologies of multimedia systems. The course includes the topics: introduction to multimedia and multimedia systems, multimedia data representation, multimedia applications, multimedia tools, hands on practice on multimedia system creation using tools, multimedia standards, communication requirements of multimedia data and multimedia information retrieval.

The course addresses hardware and software requirements of multimedia systems, multimedia authoring tools, multimedia on the internet, macromedia flash application, working on sound picture and animation working on multimedia icons and working on flash files.

Course Objectives:

Upon completion of this course the student will be able to:

- Identify hardware & software requirements for multimedia systems
- Familiar with different kinds of multimedia tools
- Analyze multimedia Data Representations
- Develop simple multimedia application in different areas.

Course Content:

Chapter 1: Introduction to multimedia systems

- 1.1. History of Multimedia Systems
- 1.2. Hypermedia/Multimedia
- 1.3. Overview of Multimedia Software Tools

Chapter 2: Issues in Multimedia Authoring

- 2.1. Multimedia Authoring Metaphors
- 2.2. Content Design
- 2.3. Visual Design
- 2.4. Technical Design

Chapter 3: MULTIMEDIA DATA REPRESENTATIONS

- 3.1. Basics of Digital Audio
- 3.2. Graphic/Image File Formats
- 3.3. Color in Image and Video
- 3.4. Basics of Video

CHAPTER 4: VIDEO AND AUDIO COMPRESSION

- 4.1 Lossless Compression Algorithms
- 4.2. Image Compression—JPEG

- 4.3. Video Compression
- 4.4. Audio Compression

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 25% |
| ◆ Project | 35% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Suzanne, Jennifer, et al., Multimedia Basics, 2004, Thomson Course Tech.

References:

1. Tay Vaughan. 2006. Multimedia: Making it Work, 7th ed. ISBN-10 0072264517.
2. Ralf Steinmetz & KlaraNahrstedt, Multimedia Fundamentals: Media Coding & Content Processing, Prentice Hall
3. Multimedia Systems, By Ralf Steinmetz, KlaraNahrstedt – Computer – 2004
4. ZeNian Li & M. S. Drew, Fundamentals of Multimedia, 2004, Prentice Hall
5. G. Lu, Multimedia Database Management Systems, 1999, Artech House
6. K.R. Rao et al., Multimedia Communication Systems, 2002, Prentice Hall
7. Multimedia Systems: delivering, generating, and interactive with multimedia, by Tim Morris- 2000
8. Handbook of Internet and Multimedia Systems and Applications: Concepts, services, and systems; by BorkoFurht – 1999
9. Video and Image Processing in Multimedia Systems – by Borivoje, Furht, Hong Jiang Zhang, Stephen W. smoliar – computers – 1995.

Course Title: Introduction to Artificial Intelligence
Course Number: INSY 434
Credit Hour: 3
Prerequisite: Data structure and Algorithm Analysis , Math I

Course Description

This course introduces basic principles and current research on topics within artificial intelligence. It includes a formal representation of real world problems, search of problem spaces for solutions, and deduction of knowledge in terms of logic and reasoning. Application of these methods are made to important areas of artificial intelligence including Expert Systems, language understanding, machine-learning, neural networks, computer vision and robotics.

Course Objectives:

On completion of this course students will be able to:

- Describe the key components of the artificial intelligence (AI) field
- Outline search strategies and solve problems by applying a suitable search method
- Understand how agents reason
- Grasp the issues related to agent planning, handling uncertainty, learning from observation and communicate.
- Develop Expert Systems
- Evaluate search algorithms
- Elicit knowledge for expert systems

Course Contents:

Chapter 1: Prolog Programming

- 1.1. Introduction
- 1.2. What is PROLOG
- 1.3. Accessing PROLOG
- 1.4. Interacting with PROLOG
- 1.5. Horn Clauses
- 1.6. Queries
- 1.7. Negation
- 1.8. Arithmetic
- 1.9. Declarative and procedure meaning if prolog programs
- 1.10. Recursion
- 1.11. Lists
- 1.12. Inserting an element

Chapter 2: Overview of Artificial Intelligence

- 2.1 History of Artificial Intelligence
- 2.2 Scope of Artificial Intelligence
- 2.3 Method of Artificial Intelligence

Chapter 3: Search Techniques

- 3.1. Basic search techniques for graphs (including dynamic backtracking)
- 3.2. Heuristic searching techniques and application of objective functions

Chapter 4: Expert Systems and their Application

- 4.1 Expert systems and the example of their application
- 4.2 Knowledge Engineering
- 4.3 OPS 5 rule language
- 4.4 Using an expert system shell

Chapter 5: General Explanation

- 5.1 “How” Explanations
- 5.2 “why” Explanation

Chapter 6: Semantic Network and Frame

- 6.1. Semantic Network
- 6.2. Frame

Chapter 8: Natural Language Processing

- 8.1. Applications of NLP techniques
- 8.2. Analysis levels used for NLP (morpho-lexical, syntactic, semantic, pragmatic)
- 8.3. Recursive and augmented transition networks

Chapter 9: Parsing and Definition Clause Grammars

- 9.1 Parsing
- 9.2 Definition Clause grammars

Methods of Teaching

Lectures, Lab. hours and Programming Assignments

Assessment:

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 25% |
| ◆ Project | 35% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Stuart J. Russell and Peter Norvig, Artificial Intelligence: Modern Approach (3rd edition), USA, Prentice Hall, 2009

Reference:

- Essential Artificial intelligence (Matt Ginsberg)
- Nils J. Nilsson, 1998. Artificial Intelligence, A New Synthesis, Morgan Kaufman Publishers.
- Elements of Artificial Intelligence by Steven L. Tanimoto

Course Title: Information Assurance and Security
Course Number: INSY 554
Credit Hour: 3
Prerequisite: Systems and Network Administration and Advanced Data Base Management Systems

Course Description

The course will cover the historical background of security, fundamentals of information systems security, privacy and the importance of security for information systems. Additional topics include protection schemes, public and private key encryption techniques, and security at different layers, malicious security threats (viruses, worms, trojan horses) and web security.

Course Objectives

At the end of the course students will be able to:

- Understand potential threats of information systems
- Comprehend theories and principles of information security
- Grasp protection mechanisms and their strength and limitations
- Demonstrate how to secure files and users access
- Develop preventive procedures

Course Contents

Chapter 1: Introduction to computer security and privacy

- 1.1. Overview and historical perspectives of computer security
- 1.2. Threats, vulnerabilities, countermeasures, and the human factor

Chapter 2: Computer security threats

- 2.1. Natural treats
- 2.2. Treats of human actions

Chapter 3: Security Techniques

- 3.1. Physical security
- 3.2. Network security techniques
- 3.3. Programming security

Chapter 4: Secure system planning and administration

- 7.4 Planning Capacity for System Operations
- 7.5 Security Evaluation of New System Implementations & Operations
- 7.6 Management of Operational Changes
- 7.7 Prevention of Computer Virus & Malicious Applications
- 7.8 Security Management of Daily Operations

Chapter 5: Legal and ethical issues

- 5.1. Intellectual property
- 5.2. Copyright violation and prevention
- 5.3. Legal concerns with information Exchange

Chapter 6: Introduction to computer forensics

- 7.9 What is computer forensics?
- 7.10 Crime Investigation
- 7.11 Role of the investigator
- 7.12 Computer Crime laws

Methods of Teaching

Lectures, Assignments, group discussions and presentation

Assessment:

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 60% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Michael Whitman & Herbert, Principles of Information Security, 2nd Ed., 2005, Thomson Course Tech.

References

1. Rick Lehtinen& G.T. Gantemi, Computer Security Basics, 2nd Ed., 2006, O'Reilly Media Inc.,
2. David Salomon, Fundamentals of Computer Security, 2005, Springer
3. S.B. Sworth et el., Computer Security Handbook, 4th Ed., 2002, Willey Inc.
4. William Stallings et el., Computer Security: Principles & Practice, 2007, Prentice Hall

17.2 Elective Courses

Course Title: Data Mining and Warehousing
Course Code: INSY 521
Credit Hour: 3
Prerequisite: Advanced Data Base Systems

Course Description:

Data warehousing concepts include: understanding the purpose of OALP, data warehouse and data marts, data warehousing terminology, the components of data warehouse architecture and infrastructure, why data warehouse, building data warehouse, and the front-end tools needed for a successful data warehouse. Introduction to basic concepts behind data mining, survey of data mining applications, techniques and models, introduction to data mining software suite, exploration of data mining methodologies. Topics include decision tables, decision trees, classification rules, association rules, clustering, statistical modeling, and linear models and case studies using large data sets taken from real-life applications. Problems encountered when dealing with large data sets. How much data is enough? Extensive use of data mining software, advanced techniques in data mining, text data mining, text classification, naïve Bayes, the EM algorithm, optimization, visualization, genetic algorithms, data augmentation, Markov chain Monte Carlo techniques, knowledge extraction.

Course Objectives:

Upon completion of the course, students will be able to:

- Understand the nature and purpose of data mining
- Describe the theoretical constructs and core processes of data mining
- Capture the basic statistical concepts related to data mining.
- Describe the predictive modeling functions of data mining.
- Grasp the types and characteristics of predictive models.
- Describe the potential applications of data mining

Course Contents:

Chapter 1. Introduction to Data mining

- 1.1 Motivation: Why data mining?
- 1.2 What is data mining?
- 1.3 Data Mining: On what kind of data?
- 1.4 Data mining functionality
- 1.5 Are all the patterns interesting?
- 1.6 Classification of data mining systems
- 1.7 Major issues in data mining

Chapter 2. Data Preprocessing

- 2.1 What is Data?
- 2.2 Why Preprocess the Data?
- 2.3 Data Cleaning
- 2.4 Data Integration
- 2.5 Data Transformation
- 2.6 Data Reduction
- 2.7 Discretization and concept hierarchy generation

Chapter 3. Mining Associations Rules in large databases

- 3.1 Association Rule Mining
- 3.2 Applications
- 3.3 Basic concepts of Support, Confidence, and Lift
- 3.4 Types of Association Rules

Chapter 4. Classification & prediction

- 4.1 What is classification? What is prediction?
- 4.2 Issues regarding classification & prediction
- 4.3 Types of classification techniques
- 4.4 Application of classification

Chapter 5. Cluster Analysis

- 5.1 What is Cluster Analysis?
- 5.2 Types of Data in Cluster Analysis
- 5.3 Categorization of Major Clustering Methods
- 5.4 Applications of Cluster Analysis

Chapter 6. Data warehousing

- 6.1 What is data warehouse?
- 6.2 Difference between operational databases system and data warehouse
- 6.3 Why have a separate data warehouse

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment:

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 35% |
| ◆ Project | 25% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Data Mining : Concepts and Techniques, 2nd edition, Jiawei Han, MichelineKamber, Morgan Kaufmann, ISBN 1558609016, 2006.

References:

1. Mastering Data Mining, Michael Berry & Gordon Linoff, John Wiley & Sons, 2000.
2. Introduction to Data Mining Using SAS Enterprise Miner, Patricia Cerrito, ISBN: 978-1-59047-829-5, SAS Press, 2006.
3. Data Mining: A Knowledge Discovery Approach, Springer,K. Cios, W. Pedrycz, R. Swiniarski, L. Kurgan, ISBN: 978-0-387-33333-5, 2007.
4. Data Mining Introductory and Advanced Topics, Margaret Dunham, ISBN: 0130888923, Prentice Hall, 2003.
5. Advances in Knowledge Discovery and Data Mining, U. Fayyad, G. Piatetsky-Shapiro, P. Smyth, R. Uthurusamy, editors, AAAI/MIT Press, 1996

Course Title: Selected Topics in Information Systems
Course Number: INSY 504
Credit Hour: 2
Prerequisite: As Per the Content Selection at the Time of Delivery

Course Description

The course describes up-to-date theories, principles and technologies in information systems that are not covered in the courses offered during the program. Topics studied vary from year to year depending on trends in the field.

Course Objectives

It depends on the topic that is selected during course offering decisions

Textbook

It depends on the topic that is selected during course offering decisions

Evaluation Scheme

It depends on the topic that is selected during course offering decisions

Course Title: Knowledge Management
Course Code: INSY 522
Credit Hour: 3
Prerequisite: Introduction to ICT

Course description

Thorough coverage of the latest theory and practice of Knowledge Management (KM), with an integrated interdisciplinary presentation that makes sense of the confusingly wide variety of computer science and business KM perspectives arising simultaneously from artificial intelligence, information systems, and organizational behavior. This course covers the "hard" technical components of computer tools and technology for managing knowledge, without losing sight of the "soft" management needs and challenges in leveraging knowledge effectively within an organization. This course critically evaluates the nature, computer representation, access, and utilization of knowledge versus information within a human context and provides an essential preparation for managerial, technical, and systems workers in today's modern knowledge-based economy.

Course objectives

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

- Understand the fundamental concepts in the study of knowledge and its creation, acquisition, representation, dissemination, its use and re-use and management.
- Appreciate the role and use of knowledge in organizations and institutions, and the typical obstacles that KM aims to overcome.
- Know the core concepts, methods, techniques, and tools for computer support of knowledge management.
- Understand how to apply and integrate appropriate components and functions of various knowledge management systems.
- Be prepared for further study in knowledge generation, engineering, and transfer, and in the representation, organization, and exchange of knowledge.
- Critically evaluate current trends in knowledge management and their manifestation in business and industry.

Course Contents:

Chapter 1: Introduction to Knowledge Management

- 1.1. What is Knowledge Management?
- 1.2. Different perspectives on knowledge management
- 1.3. What is the difference between data, information and knowledge?
- 1.4. Managing knowledge from ancient times to today

Chapter 2: Philosophical Perspectives on Knowledge

- 2.1. What is knowledge?
- 2.2. Burrell and Morgan's framework on philosophical paradigms
- 2.3. Competing philosophical positions in knowledge management
- 2.4. Contemporary notions of 'knowledge' in knowledge management

Chapter 3: Organizational Learning

- 3.1. How do we learn as individuals?
- 3.2. How do teams learn?
- 3.3. How do organizations learn?
- 3.4. The role of politics in organizational learning

Chapter 4: Knowledge Management Tools

- 4.1. Tools for organizing knowledge
- 4.2. Tools for capturing knowledge
- 4.3. Tools for evaluating knowledge
- 4.4. Tools for sharing knowledge
- 4.5. Tools for storing and presenting knowledge

Chapter 5: Chapter 5: Knowledge Management Systems

- 5.1. Systems Thinking
- 5.2. Drivers of Knowledge Management Systems
- 5.3. Knowledge Management Systems

Chapter 6: Strategic Management Perspectives

- 6.1. Strategic management: schools of thought
- 6.2. Resource-based and knowledge-based view of the firm
- 6.3. Information systems and knowledge management strategy

Chapter 7: Knowledge Management and Culture

- 7.1. The nature of organizational culture
- 7.2. The role of culture in knowledge conversion and creation processes
- 7.3. Communities of practice and the role of storytelling

Chapter 8: Change Management

- 8.1. Leadership and change
- 8.2. Change management strategies
- 8.3. Human Resource Interventions in change management

Chapter 9: Knowledge Management and the Learning Organization

- 9.1. Organizational learning and the learning organization
- 9.2. Dominant models of the learning organization
- 9.3. Power, politics and the learning organization

Chapter 10: Intellectual Capital

- 10.1. Emergence of intellectual capital from a historic perspective
- 10.2. Commonality among intellectual capital frameworks
- 10.3. Intellectual capital as a narrative

Method of Teaching

Lectures, Assignments, group discussions and presentation

Assessment:

- | | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 60% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Irma Becerra-Fernandez, Avelino Gonzalez, Rajiv Sabherwal (2004). *Knowledge Management Challenges, Solutions, and Technologies* (edition with accompanying CD). Prentice Hall. ISBN: 0-13-109931-0.

Reference book:

1. Elias M. Awad, Hassan M. Ghaziri (2004). *Knowledge Management*. Prentice Hall. ISBN: 0-13-034820-1.

2. Ian Watson (2002). *Applying Knowledge Management: Techniques for Building Corporate Memories*. Morgan Kaufmann. ISBN: 1558607609.
3. MadanmohanRao (2004). *Knowledge Management Tools and Techniques: Practitioners and Experts Evaluate KM Solutions*. Butterworth-Heinemann. ISBN: 0750678186.
4. AmritTiwana (2002). *The Knowledge Management Toolkit: Orchestrating IT, Strategy, and Knowledge Platforms* (2nd Edition). Prentice Hall. ISBN: 013009224X.
5. Stuart Barnes (ed) (2002). *Knowledge Management Systems Theory and Practice*. Thomson Learning.

Course Title: Expert System
Course Number: INSY 536
Credit Hour: 3
Prerequisite: Introduction to Artificial Intelligence

Course Description:

This course provides a brief history of expert systems: Why expert systems? It helps students analyse economic reasons, time, space, consistency and quality in decision-making alongside intellectual reasons, human cognitive shortcomings and pure reasoning systems versus knowledge-rich systems and knowledge acquisition: its meaning, purpose, and techniques. It also covers knowledge representation: frames, rules, classes and procedures. An introduction to expert system development tools and shells is also provided including inference methods: forward and backward chaining, depth/breadth approaches, rule selection strategies and an explanation of how/why, symbolic and non-symbolic systems, probability/certainty factor, statistical systems, neural nets and case-based reasoning.

Course Objectives:

On completion of this course students will be able to:

- Appreciate the link between AI and Expert System
- Understand the historical development of knowledge based systems
- Develop and appreciate knowledge-based systems and their architectures
- Comprehend a wide variety of knowledge representation techniques
- Grasp various methods for representing and reasoning uncertainty

Course Content:

Chapter 1: Introduction (2hrs)

- 1.1. Expert System definition
- 1.2. Difference between Expert System and Knowledge-based systems
- 1.3. Debates surrounding Expert Systems
- 1.4. Why Expert Systems fail

Chapter 2: Expert System Today (4hrs)

- 2.1. Expert System for competitive advantage
- 2.2. Market understanding of Expert System
- 2.3. The Technology
- 2.4. Expert System applications

Chapter 3: The Corporate Approach (8hrs)

- 3.1. Why companies are investing in Expert System
- 3.2. Building in expertise
- 3.3. How to introduce Expert System into a firm
- 3.4. Artificial intelligence versus human intelligence
- 3.5. Executive Information System and Expert System
- 3.6. Expert System and databases
- 3.7. Management and Information Technology

Chapter 4: Expert and Expertise (7hrs)

- 4.1. Who is an expert

- 4.2. What is an expert
- 4.3. Barriers to the experts and their expertise
- 4.4. Problem solving
- 4.5. How we think
- 4.6. What is thinking
- 4.7. Human judgment and choice
- 4.8. Resistance by experts in developing an Expert System

Chapter 5: Knowledge Acquisition (5hrs)

- 5.1. Identifying the appropriate expert
- 5.2. The transmission gap
- 5.3. Using multiple experts
- 5.4. The process of knowledge acquisition
- 5.5. Motivating the experts

Chapter 6: Knowledge Engineering (7hrs)

- 6.1. Knowledge engineer definition
- 6.2. Skills requirement
- 6.3. Roles of a Knowledge engineer
- 6.4. Finding Knowledge engineers
- 6.5. Training of Knowledge engineers
- 6.6. Expert resistance issues
- 6.7. Prototyping
- 6.8. Tricks in Knowledge Engineering

Chapter 7: Expert System: the investment decision (5hrs)

- 7.1. Business strategy
- 7.2. Management support
- 7.3. Expert Systems and the investment risks
- 7.4. Justifying the investment
- 7.5. Identifying meaningful applications

Chapter 8: Real world examples of expert systems (5hrs)

- 8.1. Corporate Load Evaluation System (CLES)
- 8.2. General Business Plan Expert System (GBP)
- 8.3. Strategic Market Planner Expert System (SMARTPLAN)
- 8.4. The Marketing Audit Model (MAC)

Method of Teaching:

Lectures, Assignments, group discussions and presentation, Laboratory sessions

Assessment:

- ◆ Quiz and Assignment: 20%
- ◆ Tests: 20%
- ◆ Project: 20%
- ◆ Final Exam: 40%

Textbooks

1. It Joseph C. Giarratano and Gary D. Riley, Expert Systems: Principles and Programming (4th edition), USA, Course Technology, 2004

2. Peter Jackson, Introduction to Expert Systems (3rd Edition), USA, Addison Wesley, 1998

References:

1. John Durkin, Expert Systems: Design and Development, USA, Prentice Hall, 1994.
2. Sholom M. Weiss and Casimir A. Kulikowski , A Practical Guide to Designing Expert Systems USA, Rowman& Littlefield Pub Inc , March 1984
3. Introduction To Artificial Intelligence & Expert Systems, David Andrew Patterson, PHI Learning, 2007
4. Introduction To Expert Systems (3rd Edition), Peter Jackson, 1998
5. Expert Systems: Design and Development, John Durkin, 1998

Course Title: UNIX System Administration and Support
Course Number: INTE541
Credit Hour: 3
Prerequisite: Operating Systems, Data Communications and Computer Networks

Course description

This course is designed to introduce the students to how to perform basic and advanced systems administrative tasks on UNIX environments with the intention of enabling them to have the skills to manage users, service files, hardware devices and networks. Topics covered include, but not limited to, installation and configuration of a UNIX-based operating system, maintenance and monitoring of file systems, managing users, monitoring and troubleshooting system performance, developing and customizing user login and other start-up scripts, managing system services, shell scripting, automating system services, installing and updating application software, connecting to a network, implementing file servers, print servers and web server, mail servers, security administration, firewalls and IP masquerading, system backups and restores, and package and patch administration.

Course objectives:

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

- Describe, define and understand the open and free software principles and mottos
- Understand the various UNIX and Linux-based operating system distributions
- Install and configure a Linux-based operating system
- Use and manage the operating system installed and configured
- Monitor and fine tune performances of typical operating system features
- Manage users and other resources in the operating system, possibly on a networked system
- Install, configure and test file, mail, print and web servers
- Perform security related configurations and patch updates
- Perform system backups and restores

Course Content:

Chapter 1: Installation and configuration of an UNIX operating system

- 1.1. Maintenance and monitoring of file systems
- 1.2. Managing users
- 1.3. Monitoring and troubleshooting system performance
- 1.4. Developing and customizing user login and other start-up scripts

Chapter 2: Managing system services

- 2.1. Shell scripting
- 2.2. Automating system services
- 2.3. Installing and updating application software

Chapter 3: Networking

- 3.1. Connecting to a network
- 3.2. Implementing file servers, printer servers and web servers, mail servers,

Chapter 4: Security Administration

- 4.1. Firewalls and IP masquerading
- 4.2. System backups and restores
- 4.3. Package and patch administration.

Chapter 5: Writing Good GNU/Linux Software

- 5.1. Editing with Emacs
- 5.2. Compiling with GCC
- 5.3. Automating the Process with GNU Make
- 5.4. Debugging with GNU Debugger (GDB)
- 5.5. Finding More Information
- 5.6. Interaction With the Execution
- 5.7. Environment
- 5.8. Coding Defensively
- 5.9. Writing and Using Libraries

Chapter 6: Processes

- 6.1. Looking at Processes
- 6.2. Creating Processes
- 6.3. Signals
- 6.4. Process Termination

Chapter 7: Threads

- 7.1. Thread Creation
- 7.2. Thread Cancellation
- 7.3. Thread-Specific Data
- 7.4. Synchronization and Critical Sections
- 7.5. GNU/Linux Thread Implementation
- 7.6. Processes vs. Threads

Chapter 8: Interprocess Communication

- 8.1. Shared Memory
- 8.2. Processes Semaphores
- 8.3. Mapped Memory
- 8.4. Pipes
- 8.5. Sockets

Method of Teaching

Lectures, Assignments, Class group discussions, projects works, and Laboratory demonstrations

Assessment

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 45% |
| ◆ Project | 15% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Textbook:

Evi Nemeth, Gareth Snyder et al., UNIX System Administration Handbook, 3rd Ed., 2001, Prentice Hall

References

1. Dave Taylor, Sams Teach Yourself UNIX System Administration in 24 Hours, SamsPublishing
2. David Tansley, Linux and UNIX Shell Programming
3. Mark Burgess, Principles of Network and System Administration

Course Descriptions for Supportive Courses

Course Title: Principles of Accounting I

Course Number: ACCN 211

Credit Hours: 3

Prerequisite: None

Course Description:

This course is an introduction to basic principles of accounting theory and practice. Topics covered include accrual basis accounting, the accounting cycle, preparation of financial statements for both service and merchandising business enterprises, and internal controls. Other topics include accounting for cash, receivables, payroll, inventories, fixed assets and current liabilities.

Course Objectives:

Upon successful completion of this course, students should be able to:

- Analyze, journalize, and post business transactions.
- Prepare a multiple-step income statement, an owners' equity statement, and a classified balance sheet.
- Analyze existing account balances; prepare end-of-period adjusting and closing entries and a post closing trial balance.
- Account for cash and petty cash including internal controls over cash.
- Account for merchandising companies including costing and internal control over inventory.
- Account for property, plant, and equipment; accounts receivable; and current liabilities.

Course Contents:

Chapter 1. Basic Structure of Accounting

- 1.1 Accounting , The Language of Business
- 1.2 Evolution, Definition and importance of Accounting
- 1.3 Characteristics of Accounting information and its users
- 1.4 The profession of Accounting
- 1.5 Accounting principles and concepts
- 1.6 The distinction between book keeping and accounting
- 1.7 Business transactions and the accounting equation
- 1.8 Accounting statements

Chapter 2. The Accounting Cycle

- 2.1 Accounting Cycle defined
- 2.2 The use of Accounts for recording transactions
- 2.3 Rules of Debits and Credits
- 2.4 Classification of Accounts
- 2.5 Sequence and numbering of ledger accounts
- 2.6 Recording transaction in a journal
- 2.7 Posting to the ledgers
- 2.8 Adjustments in preparations of final accounts

- 2.9 Worksheet for financial statements
- 2.10 Preparation of financial statements
- 2.11 Journalizing and posting adjusting and closing entries
- 2.12 Journalizing and posting reversing entries.

Chapter 3. Accounting for a merchandising enterprise

- 3.1 Purchasing and selling procedures
- 3.2 Accounting for purchases
- 3.3 Accounting for sales
- 3.4 Trade discounts, credit terms and cash discounts (transportation costs and sales taxes)
- 3.5 Special journals and subsidiary Ledgers
- 3.6 Periodic reporting
- 3.7 Merchandise inventory adjustments on the work sheet.
- 3.8 Completion of the work sheet.
- 3.9 Preparation of financial statements

Chapter 4. Deferrals and Accruals

- 4.1 Deferral
- 4.2 Definition
- 4.3 Prepaid expenses
- 4.4 Unearned revenue
- 4.5 4.2 Accruals
- 4.6 Definition
- 4.7 Accrued Liabilities
- 4.8 Accrued Assets

Chapter 5: Accounting Systems Design

- 5.1 Principles of Accounting Systems
- 5.2 Accounting System Installation and Revision
- 5.3 Basic Principles of internal control
- 5.4 Subsidiary Ledgers
- 5.5 Special Journals
- 5.6 Purchases Journal (PJ)
- 5.7 Cash Payment Journal (CPJ)
- 5.8 Sales Journal (SJ)
- 5.9 Cash receipt journal (CRJ)
- 5.10 Two Column General Journal (GJ)

Chapter 6: Cash

- 6.1 Control over cash
- 6.2 Internal Control of cash receipts
- 6.3 Internal Control of cash payments.

Chapter 7: Receivables and Temporary Investments

- 7.1 Classification of receivables
- 7.2 Control over receivables
- 7.3 Characteristics of notes receivable
- 7.4 Accounting for notes receivable
- 7.5 Uncollectible receivables

7.6 Temporary investments.

Method of Teaching:

Lectures, Assignment, class works, and group discussions

Assessment:

- ◆ Continuous Assessments(quizzes, tests, assignments, class activities& attend etc) 60%
- ◆ Final Exam 40%
- ◆ **Total** 100

Textbook:

Weygandt, Kieso, and Kimmel. Accounting Principles.8e, ISBN10: 0471980193.

References:

1. Owen, Glenn, Using Excel and Access2007 for Accounting, 2e, 2009, ISBN10: 0324594399
2. Fundamental Accounting Principles, 18th Edition, Wild, Larson, Chiappetta, 2007, ISBN 978-007-3266480. Chapters 1 – 11.
3. College Accounting by Heintz and Parry, 2005
4. Accounting Theory by Harry Wolk et al., 6th Ed., 2004

Course Title: Introduction to Small Business Management and Entrepreneurship

Course Number: MAEN 214

Credit Hour: 3

Prerequisite: None

Course description:

This interdisciplinary course is designed to introduce students to the concept of sustainable entrepreneurship, a manageable process that can be applied across careers and work settings. It focuses on building entrepreneurial attitudes and behaviors that will lead to creative solution with in community organizational environments. Course topics include the history of entrepreneurships, the role of entrepreneurs in the 21st century global economy, and the identification of entrepreneurial opportunities. The element of creative problem solving, the development of a business concept/model, and the examination of feasibility studies and the social/moral/ethical implications of Entrepreneurship will be covered.

Course objectives:

Upon successful completion of this course, students should be able to:

- Describe and define the nature of entrepreneurship within the context of society, organization and individuals
- Explain entrepreneurship as a creative and innovative process
- Grasp the importance of developing and using a business plan
- Discuss the factors to be considered in starting a new venture
- Understand the specific management issues involved in setting up and running a small enterprise.
- Distinguish between an entrepreneurial and conventional approach to management.
- Develop a concept for an innovative product or service in his/her own area of interest.
- Develop a personal framework for managing the ethical dilemmas and social responsibilities facing entrepreneurs.
- Equip with the basic knowledge and skills of starting and operating a business for they will be future managers (or owner-managers) of these firms.

Course Contents:

Chapter 1: Entrepreneur and Free Enterprise

- 1.1. Definition and philosophy
- 1.2. History
- 1.3. Role within the economy
- 1.4 Entrepreneurship, creativity and Innovation

Chapter 2: Small Business

- 2.1 Definition and importance
- 2.2 Economic social & political aspects of small business enterprise
- 2.3 Small Business Failure factors.
- 2.4 Problems in Ethiopia small business
- 2.5 Setting Small Business

Chapter 3: Business Planning

- 3.1 The concept of business planning
- 3.2 Feasibility planning

- 3.3 The business plan
- 3.4 Developing a business plan

Chapter 4: Product & Concept

- 4.1 Product technology
- 4.2 Product development process
- 4.3 Product protection

Chapter 5: Marketing & New Venture Development

- 5.1 Marketing research
- 5.2 Marketing intelligence
- 5.3 Competitive analysis
- 5.4 Marketing strategies
- 5.5 International markets

Chapter 6: Organizing & Finance the new Venture

- 6.1 Entrepreneurial team and business formation
- 6.2. Sources of financing

Chapter 7: Managing Growth & Transactions

- 7.1 Preparing for the launch of the venture
- 7.2 Managing early growth of venture
- 7.3 New venture expansion strategies and Issues (Mergers, Acquisitions, licensing and Franchising)
- 7.4 Ethical issues governing Entrepreneurship

Method of Teaching

Lectures, Assignments, Class group discussions, projects works

Assessment:

| | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 30% |
| ◆ Project | 30% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Textbook:

Nicholas Siropilis: Entrepreneurship and Small Business Management 6th ed. 1998;
LI Indian Publishers, New Delhi

References

1. Kuratko, Donald. Entrepreneurship: Theory, Process and Practice, 2008. ISBN10: 0324590913
2. Katz, Jerry and R. Green, Entrepreneurial Small Business, 2008. ISBN 0073405063.
3. How to Write a Business Plan, Ethiopian Chamber of Commerce, 2004.
4. Small Business Management: Launching and Growing Entrepreneurial Ventures,J. Longenecker et al., 2007, 768 p. ISBN-10: 0324569728

Course Title: Organizational Behaviour
Course Number: MAEN 422
Credit Hour: 3
Prerequisite: None

Course Description:

The course is based on the premise that in today's turbulent business environment, it is imperative that Human Resource professionals understand organizational behavior and how it contributes to organizational effectiveness. Highlighting best practice principles, the course develops the student's understanding of the theories and methodologies inherent in these practices and engages the students in discussions on the challenges facing Ethiopian organizations.

Course Objectives:

Upon successful completion of this course, students should be able to:

- Diagnose organizational problems to ensure the problems are identified and the applicable strategies and techniques selected
- Determine the interventions, activities and programs required to increase
- Organizational effectiveness
- Identify the strategies and techniques utilized to enhance organizational performance
- Characterize the importance of leadership in managing organizational challenges

Chapter 1: Introduction

- 1.1. Definition of Organization Behavior
- 1.2. What managers do
- 1.3. Enter organizational Behavior
- 1.4. Contributing Disciplines to OB
- 1.5. Challenges and Opportunities to OB

Chapter 2: The Individual in an Organization

- 2.1. Foundation of Individual Behavior
- 2.2. Values, attitudes and Job satisfaction
- 2.3. Personality and Emotion
- 2.4. Perception and Individual decision making
- 2.5. Basic Motivation concepts and from conception to application

Chapter 3: The Group in an organization

- 3.1. Foundation of Group behavior
- 3.2. Understanding Work Team
- 3.3. Group Communication
- 3.4. Leadership and Trust
- 3.5. Power and Politics
- 3.6. Conflict and Negotiation

Chapter 4: The Organization System

- 4.1. Foundation of Organization Structure
- 4.2. Work Design and Technology
- 4.3. Human Resource Policies and Practices
- 4.4. Organizational Culture
- 4.5. Organizational change and Development

Method of Teaching

Lectures, Assignments, Class group discussions, projects works

Assessment:

| | |
|---|-----|
| ◆ Continuous Assessment: assignments, tests, quizzes, presentations | 25% |
| ◆ Midterm exam | 20% |
| ◆ Project work | 25% |
| ◆ Final Exam | 30% |

Textbook:

Stephan P. Robbins and Timothy A. Judge, Organizational Behavior, 13th International edition, 2008, ISBN10: 013207964X, ISBN13: 9780132079648, Pearson Education (US)

References:

1. Stephan P. Robbins and Timothy A. Judge, Organizational Behavior, 13th International edition, 2008, ISBN13: 9780132079648, Pearson Education (US).
2. Joel Marcus, Organization and Management, an International Approach, NoordhoffUitgevers B.V., 1st edition (2007), ISBN10 9001577040, ISBN13 9789001577049
3. Organizational Behavior. Understanding and Managing People at Work by Donald D. White and David A. Bednar, 1986

Course Title: Mathematics I
Course Number: MATH 203
Credit Hour: 4
Prerequisite: None

Course Description:

Basic mathematics logic, sets and their operations, functions and their graphs, matrix and its manipulations, system of linear equations and inequalities, elementary counting principles , recurrence relations, elements of Graph Theory: Definition , Examples, Matrix Representation, path and connectivity of a graph complete, regular and bipartite graph, trees and forest.

Course Objectives:

Upon successful completion of this course, students should be able to:

- Explain the basic concepts of logic, sets and matrices.
- Explain the concept of function.
- Apply the graphs of linear quadratic, logarithmic and exponential functions.
- Analyze the system of linear equations of 2×2 and 3×3 .
- Analyze the system of linear inequalities of 2×2 and 3×3 .
- Solve linear programming problems of smaller inequalities.
- Apply the methods and principles obtained to solve problems in the study of information science.
- Apply the graphs in application software.

Course Contents:

Chapter 1: LOGIC, SETS AND SET OPERATION

- 1.1. Basics of mathematics logic
- 1.2. Proposition and logical connectives
- 1.3. Open propositions and quantifiers
- 1.4. Arguments and validity
- 1.5. The concepts of sets and elements
- 1.6. Notation
- 1.7. Description of sets
- 1.8. Special sets
- 1.9. Subsets and proper subsets
- 1.10. Venn diagrams
- 1.11. Set operations and their properties
- 1.12. Set operations
- 1.13. Basic properties of the set operations

Chapter 2: FUNCTIONS AND GRAPHS

- 2.1. Concept of a function
- 2.2. Combination and composition of functions
- 2.3. Linear function and its graph
- 2.4. Definition and properties of linear function
- 2.5. Graph of a linear function
- 2.6. Quadratic function and its graph
- 2.7. Definition and properties of a quadratic function

- 2.8. Graph of a quadratic function
- 2.9. Definition and properties of a polynomial function
- 2.10. Graph of a polynomial function
- 2.11. Exponential and logarithmic functions and their graphs
- 2.12. Definitions of exponential and logarithmic functions
- 2.13. Rules of exponential and logarithmic functions
- 2.14. Graphs of exponential and logarithmic functions
- 2.15. The trigonometric functions
- 2.16. Graphs of trigonometric functions
- 2.17. Trigonometric identities and equations
- 2.18. Solving a plane triangle

Chapter 3: MATRIX

- 3.1. Definition of matrix
- 3.2. Special matrices
- 3.3. Manipulation of matrices
- 3.4. Inverse of a matrix
- 3.5. Determinant of a matrix

Chapter 4: SYSTEM OF LINEAR EQUATIONS

- 4.1. System of linear equations in two variables
- 4.2. System of linear equations and augmented matrix
- 4.3. Gaussian elimination method
- 4.4. Gauss-Jordan method

Chapter 5: COMPLEX NUMBER

- 5.1. The concept of complex number
- 5.2. Operations on complex numbers
- 5.3. Conjugate and modulus of complex number
- 5.4. Finding the square root of a complex numbers
- 5.5. Geometric representation of complex numbers

Chapter 6: ELEMENTARY COUNTING PRINCIPLES

- 6.1. Basic counting principle
- 6.2. Permutation and combinations
- 6.3. The binomial theorem
- 6.4. Applications

Teaching Method:

Lecturing 4 hrs per week for 16 weeks, assigning exercises per topic to solve them independently or in groups

Assessment:

| | |
|------------------------------------|-----|
| ◆ Assignment (Individual or group) | 20% |
| ◆ Mid semester exam | 20% |
| ◆ Continuous test | 20% |
| ◆ Attendance | 10% |
| ◆ Final exam | 30% |

Text Book:

Applied Finite Mathematics, S. T. Tan, 5th Edition, 1997 (30 copies)

References:

1. College Algebra in Context, Harshberger and Yocco, 2007.
2. College Algebra , Hornsby and Lial, 2nd Edition, 1999 (38 copies)
3. College Mathematics for Business, Economics, Life and Social Sciences, Raymond A. Barnett 10ed, 2005
4. Mathematics for Business, Economics, Life Sciences, and Social Sciences, 11th Edition, 2008,
5. Applied Mathematics for Managerial, Life and Social Sciences , S.T. Tan, 4ed.,2003

Course Title: Mathematics II
Course Number: MATH 204
Credit Hour: 4
Prerequisite: Mathematics I

Course Description:

The course introduces the basic concepts of Limits: One-sided limits, infinite limits, Continuity of a function, Derivatives, Derivatives of Inverse Trigonometric, Hyperbolic functions, Implicit differentiation, Applications of derivatives, Integration: indefinite integral, techniques of integration, definite integrals, Application of integrals: area, volume, arc length; Improper integrals; Differential Calculus of two variables: limits, continuity, partial derivatives, tangent lines, directional derivatives, gradient, total differential, tangent planes, relative extrema; Double integral in iterated form, polar form, Applications

Course Objectives:

Upon successful completion of this course, students should be able to :

- Analyze the formal definition of Limit and Continuity
- Apply the Limit of Functions
- Analyze the points of discontinuity of Functions
- Analyze the derivative of Functions
- Apply derivatives of different types of Functions
- Use derivatives to solve problems
- Apply derivatives to sketch the graph of Functions
- Analyze an integral of a Function
- Apply integrals of different types of Functions
- Use integrals to find areas and volumes

Chapter 1: Introduction to Limit and Continuity

- 1.1. Limits of functions
 - 1.1.1. Definition of limits
 - 1.1.2. Properties of limits and limit theorems
 - 1.1.3. One –sides limits
 - 1.1.4. Infinite limits and limits at infinity
 - 1.1.5. Two important limits
- 1.2. Continuity
 - 1.2.1. Continuous functions
 - 1.2.2. Properties of continuous functions

Chapter 2: Introduction and Application of Differential Calculus

- 2.1. Difference quotient of a function
- 2.2. Definition and properties of derivatives
- 2.3. Derivatives of some basic functions
- 2.4. Derivatives of combination and composition of functions
- 2.5. Implicit differentiation and higher derivatives
- 2.6. Application of derivatives

Chapter 3: Differential Calculus of Function of Two Variables

- 3.1. Limits and continuity

- 3.2. Partial derivatives
- 3.3. The chain rule and implicit differentiation

Chapter 4: Introduction and Application of Integral Calculus

- 4.1. Definition of indefinite integral
- 4.2. Techniques of integration
- 4.3. Definite integral and fundamental theorem of calculus
- 4.4. Double integrals
- 4.5. Application of integrals

Chapter 5: Sequence and Series

- 5.1. Sequences
 - 5.1.1. Definition, Examples and Limits of sequences
 - 5.1.2. Convergence properties of sequences
- 5.2. Series
 - 5.2.1. Definition of partial sum
 - 5.2.2. Convergence and divergence test for infinite series
 - 5.2.3. Differentiation and integration of power series
 - 5.2.4. Taylor series and Taylor's formula

Teaching Method:

Lecturing 4 hrs per week for 16 weeks, assigning exercises per topic to solve them independently or in groups

Assessment:

| | |
|-------------------------------------|-----|
| ◆ Assignment (Individual or group) | 20% |
| ◆ Continuous test | 20% |
| ◆ Mid semester exam | 20% |
| ◆ Attendance | 10% |
| ◆ Final exam | 30% |

Text Book:

1. Calculus for Business, Economics, Life and Social sciences, Raymond A. Barnett, 10e,2003
2. K.A.Stroud ,Engineering Mathematics, sixth edition

Additional References:

1. Calculus and Its Applications Larry J. Goldstein, 9ed, 2005
2. Applied Mathematics for Managerial, Life and Social Sciences, S.T.Tan, 4ed, 2007
3. College Algebra, Hornsby and Lial, 2nd Edition, 1999 (38 copies)
4. Calculus Concepts and Context, James Stewart, 1997.

Course Title: Introduction to Probability and Statistics

Course Number: STAT 301

Credit Hour: 3

Prerequisite: Mathematics I

Course Description:

This course is designed to show students the meaning of statistics, methods of data collection, methods of data presentation, and how to calculate measures of central tendency, measures of variation, moments, skewness and kurtosis, counting techniques, concepts of probability, probability distributions, sampling and sampling distribution of the sample, linear regression and correlation.

Course Objective:

Upon completion of this course, the students will be able to;

- Discuss and use statistical methods.
- Organize and analyze statistical data
- Interpret and apply statistical analyses

Course Contents

Chapter 1: Introduction

- 1.1 Definition and Classification of Statistics
- 1.2 Steps of statistical investigation
- 1.3 Importance and Limitation of Statistics

Chapter 2: Collection of data

- 2.1 Types of Statistical Data
- 2.2 Sources of Data
- 2.3 Population and Sample
- 2.3 The Need for Sampling

Chapter 3: Sampling Techniques

- 3.1 Probability Sampling
- 3.2 Non Probability Sampling

Chapter 4: Classification and Presentation of Data

- 4.1 Types of Classification
- 4.2 Tabular method of data presentation
 - 4.2.1 Frequency distribution table
- 4.3 Diagrammatic and graphical methods of data presentation

Chapter 5: Measures of Central Tendency

- 5.1 Introduction
- 5.2 Mathematical Measures
- 5.3. Relationship between Arithmetic mean, Geometric mean and Harmonic mean
- 5.4. Positional Measures
- 5.5. Symmetrical and Skewed Distributions
- 5.6. Properties of the averages

Chapter 6: Measures of Variation

- 6.1. Definition and Purpose
- 6.2. Types of Measures of Variation

Chapter 7: Simple Linear Correlation and Regression

7.1. Correlation

7.2. Regression

Chapter 8: Introduction to Elementary Probability

8.1 Counting methods

8.2 Definition of Probability

8.3 Permutation and Combination

8.4 Properties

8.5 Conditional Probability

8.6 Multiplication rule

8.7 Addition rule

8.8 Continuous Probability Distributions

Chapter 9: Introduction to Estimation and Hypothesis Testing

9.1 Parameter Estimation

9.2 Hypothesis Testing

9.3 A test of Association

Method of Teaching

Lectures, Assignment, class works, and group discussions

Assessment:

| | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 60% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Books:

1. Basic Statistics for Business and Economics, Lind et al., 2006 (Business related students)
2. Introduction to Statistics and its Applications, AdemKedirGeleto, 2ed, 2009 (Technical students)

References:

1. Elementary Statistics in Social Research, Jack Levin/James Alan, 9ed, 2003
2. Complete Business Statistics, Aczel and Sounderpandian. 2006
3. Just The Essentials of Elementary Statistics, Johnson/Kuby: 3ed, 2003
4. Kapur J.N. & Sakena H.C. Mathematical Statistics, Delhi, S. Chaud & Company Ltd. 1960. India.
5. Spieqel M.R. Theory and Problems of Probability and Statistics, Singapore. McGraw Hill boon company 1982.
6. S.C. Gupta & V.K. Kappor. Fundamentals of Mathematical Statistics, Delhi, Sultan Chand & Sons Publishers, 1993., India.

17.3 General Courses

Course Title: Microeconomics

Course Number: ECON 202

Credit Hour: 3

Prerequisite: None

Course Description:

This course introduces and explores a variety of microeconomic topics, including: utility, preference, choice, consumer equilibrium, market demand, and elasticity of demand, choice involving risk, production, cost, competitive market, pure monopoly and monopolistic competition. Students will work in teams on a professional task, using their knowledge of microeconomics.

Course Objectives:

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

- Define utility, preference and choice.
- Explain how consumers optimize their objectives given the opportunity.
- Relate the concept of elasticity to consumer demand
- Describe production and cost and how they are interrelated
- Identify the basic market structures and describe their characteristics

Course content:

Chapter 1. The Theory of Consumer Behavior

- 1.1. Cardinal Utility Theories: Utility Approach
 - 1.1.1. Total and Marginal Utility
 - 1.1.2. Consumer Equilibrium
 - 1.1.3. Derivation of individual's Demand Curve
- 1.2. Ordinal Utility Theories: Indifference Curve Approach
 - 1.2.1. Indifference Curves and the Marginal Rate of Substitution
 - 1.2.2. The Budget Constraint Line
 - 1.2.3. Consumer Equilibrium
 - 1.2.4. Price and income Consumption Curve
 - 1.2.5. Derivation of Demand
- 1.3. Consumer Surplus
- 1.4. Market Demand
- 1.5. Elasticity Demand

Chapter 2. Choice involving Risk (Varian, Pindyck and Rubinfeld)

- 2.1. Introduction
- 2.2. Expected Utility
- 2.3. Risk Aversion
- 2.4. Diversification
- 2.5. Risk Spreading

Chapter 3. Theory of Production

- 3.1. The Production Function
- 3.2. Technology
- 3.3. Laws of Production

3.3.1. The Laws of Variable Proportions

3.3.2. Returns to scale

3.4. Choice of Optimal combination of Factors of Production

Chapter 4. Theory of Costs

4.1. Short-Run Costs

4.2. Long- Run Costs

4.3. Dynamic Changes in Costs -the Learning Curve

Chapter 5. Perfect Competition

5.1. The Short-Run Equilibrium of the Firm and the Industry

5.2. Market Equilibrium

5.3. The Long-Run Equilibrium of the Firm and the Industry

Chapter 6. Pure Monopoly

6.1. Short-run Equilibrium

6.2. Long-Run Equilibrium

6.3. Price Discrimination

6.4. Multi-plant Monopolist

6.5. Social Cost of Monopoly power

Chapter 7. Monopolistic Competition

7.1. Product Differentiation and the Demone Curve

7.2. The Concept of industry and product 'Group'

7.3. Short-Run Equilibrium

7.4. Long-Run Equilibrium

7.5. Excess Capacity and Welfare Loss

Method of Teaching:

Lectures, Assignment, class works, and group discussions

Assessment:

| | |
|--------------------------|------|
| ◆ Assignments an Quizzes | 30%; |
| ◆ Tests | 30%; |
| ◆ Final Examination | 40%. |

Text Book:

R.S. Pindyck and D. L. Rubinfeld, Microeconomics.

References:

1. Hal R. Varian, Intermediate Microeconomics: A Modern Approach, 4th Ed.
2. Koutsiyannis, Modern Microeconomics.
3. E. Mansfield, Microeconomics: Theory and Applications.
4. D.S. Watson, Price Theory and its Uses.
5. J.P. Gold and C. Ferguson, Microeconomics Theory.
6. D.N. Dwivedi, Microeconomics Theory.
7. Essentials of Economics, 5e, by Mankiw, 2008
8. Principles of MicroEconomics by Frank and Bernanke, 3rd ed., 2007

Course Title: Civic and Ethical Education
Course Code: CEED 201
Credit Hours: 3
Prerequisite: None

Course Description:

This course is designed to be offered as a common course to all students in the degree program in order to produce responsible, well-informed and competent citizens. The course encompasses the basic concepts of civic and ethical education, state and government, the values and principles of democracy, issues related to citizenship and patriotism, concepts of constitution and constitutionalism, fundamental human rights and major issue of development, basic ideas of international relations and contemporary issues.

Course Objectives:

At the end of the course the students will be able to:

- Explain the subject matter of civic and ethical education
- Develop professional ethics
- Appreciate the difference between state and government
- Practice the principles and values of democracy
- Understand the concept of citizen and citizenship
- Know the concept of constitution and constitutionalism
- Understand the principles of the Ethiopian constitution
- Explain the basic concepts and features of human rights
- Understand the development policies and strategies of Ethiopia
- Know the concept of international relations
- Discuss the national interest and foreign policies of Ethiopia

Course Objectives

At the end of the course students will be able to:

- Explain the concepts of civics & ethical education
- Analyze state & state formation
- Explain democracy & democratic government
- Understand the principles of check & balance in democratic system
- Appreciate democratic election & participation

Course Contents

Chapter 1. The Context of Civic Education to enhance empowerment

- 1.1 The importance of Civic Education
- 1.2 The Subject matter of Civic Education
- 1.3 The study of Civic Education in the Ethiopian Context

Chapter 2. Historical survey on State Formation

- 2.1 The development of human society as a prerequisite for the emergence of the state
- 2.2 The Origin and Development of the state

Chapter 3. Citizenship and Civic Participation

- 3.1 What do we understand by the terms " Citizen" and " Citizenship"?

- 3.2 The legal and social basis of citizenship
- 3.3 The role of the citizen
- 3.4 Responsibility of the citizen
- 3.5 Rights of the citizen
- 3.6 A rationale for civic participation

Chapter 4. Democracy and Democratic Government

- 4.1 The Culture of democracy
- 4.2 The Concept and Practices of democracy
- 4.3 The two categories of democracy
- 4.4 Democratic Principles

Chapter 5. The Principles of Check and Balance in Democratic System of Government

- 5.1 Principle of Accountability and transparency
- 5.2 The principle of Separation of Powers
- 5.3 Federalism
- 5.4 Classification of Fundamental rights and Freedom
- 5.5 Implementation of Human and Democratic Rights

Chapter 6. Democratic Elections and Citizen's Participation

- 6.1 The Concepts, significance and functions of elections
- 6.2 What type of Elections exists?
- 6.3 Features of democratic elections
- 6.4 Significance of participation of political parties in Elections

Method of Teaching

Lectures, Assignment, class works, and group discussions

Assessment:

| | |
|--|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, class attendances. etc) | 60% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

1. AAU (2005). Civic and Ethical Education, Compendium Part One. Addis Ababa: College of Social Sciences.
2. AAU (2005).Civic and Ethical Education, Compendium (2005) Part two. Addis Ababa: College of Social Sciences.
3. Miller, E.D.I (1984). Question that matter: an invitation to Philosophy
4. FDRE (1995). The constitution of Federal Democratic Republic of Ethiopia Addis Ababa.
5. Vincent, B. (1980) Philosophy: a text with readings, chapter three ethics and chapter four, Social Philosophy.

References:

1. Gorge, D and Kalaer, H. (1993) An introduction to Business Ethics.
2. Matt, C. et al. (1991). Challenges of Citizenship.
3. Palmer, D. (1996). Does the center hold? An introduction to Western Philosophy. (chapter 7, Ethics, chapter 8, Critique of Traditional Ethical Theories: chapter 9 Political and Social Philosophy).
4. Boss, A. and Boss (1998). Perspective on ethics. London: Mayfield Publishing.

5. Kassaye, A. (2001), *Fundamentals of Civic and Ethical Education*. Aurum, A. and Popkin, H.(1996) *introduction to Philosophy* (Chapter 4 & Chapter 5)

Course Title: Introduction to Philosophy (Logic)

Course Number: Phil 201

Credit Hours: 3

Prerequisite: None

Course Description:

The subject matter and purpose of logic; the fundamental laws of logic; the distinction between deductive and inductive arguments; validity and soundness in an argument; language and definition; rules of lexical definition; fallacies; categorical propositions; syllogism; syllogistic rules and fallacies; propositional logic; analogical reasoning and science and hypothesis.

Course Objectives:

At the end of the course the students will be able to:

- Develop the skills needed to construct sound arguments of one's own and evaluate the arguments of others.
- Instill a sensitivity for the formal component in language, a through command of which is indisputable to clear, effective and meaningful communication
- Process the cultivation on the habits of correct reason/critical/ thinking.
- Make distinction between good and bad arguments and avoid fallacious reasoning; and also expose students to different types of fallacy in such a way that they develop the habits of thinking self-independently.

Course Content:

Chapter 1: Basic Concepts

- 1.1. What is Philosophy?
- 1.2. Branches of Philosophy.
- 1.3. What is logic?
- 1.4. Logic as science of argument.
- 1.5. The nature of arguments
- 1.6. What is an argument?
- 1.7. Recognizing arguments
- 1.8. Types of arguments:
- 1.9. Deductive arguments
- 1.10. Inductive arguments
- 1.11. Validity, truth, soundness, strength and cogency

Chapter 2: Meanings and Definitions

- 2.1. Cognitive & Emotive Meanings of terms
- 2.2. Intension & Extension of Terms
- 2.3. Definitions & their purposes
- 2.4. Definitional Techniques
- 2.5. Criteria of Lexical Definitions

Chapter 3: Informal Fallacies

- 3.1. What is fallacy?
- 3.2. Fallacies of Relevance
- 3.3. Fallacies of Weak Induction
- 3.4. Fallacies of Presumption
- 3.5. Fallacies of Ambiguity

3.6. Fallacies of Grammatical Analogy

Chapter 4: Categorical Propositions

- 4.1. Components of categorical proposition
- 4.2. Quality, quantity and distribution
- 4.3. Venn Diagrams and the Modern Square of Opposition
- 4.4. Conversion, Obversion & contraposition
- 4.5. Traditional Square of Opposition

Chapter 5: Categorical Syllogisms

- 5.1. Standard form, mood & figure
- 5.2. Venn Diagram
- 5.3. Rules and Fallacies

Method of Teaching:

Lecture, reading assignment with presentation, seminar, tutorial

Assessment:

- ◆ Attendance and class participation 5%
- ◆ Quiz #1 and #2 20%
- ◆ Test 15%
- ◆ Individual Assignment #1 and #2 20%:
- ◆ Final exam 40%

Text Book:

- 1. Irving M. Copi et al, Introduction to Logic, 13th edition, 2009

References:

- 1. Irving M. Copi, Introduction to Logic, 12th edition, 2005
- 2. Being Logical: A Guide to Good Thinking, D. McInerney, 2005
- 3. Logic, 2nd edition, Patrick J. Hurley, 1984.

| | |
|-----------------------|----------------------------|
| Course Title: | Basic writing skills |
| Course Code: | FLEN201 |
| Credit Hours: | 3 Lecture + 1 Language Lab |
| Prerequisites: | None |

Course Description:

This is an intermediate English course that provides students with the knowledge and skills to create grammatically correct and meaningful sentences. During lectures and within the Language Lab, students are given the opportunity to expand and practice their English language ability through speaking, listening, reading and writing activities. Textbook activities are provided to formalize and expand students' knowledge.

The course proceeds to paragraph writing and gives an introduction to basic essay writing. Attention is given to the reading of textbooks and everyday English materials. Students are also provided the opportunity to study spoken English and focus on pronunciation and fluidity.

Course Objectives:

At the end of the course students will be able to:

- Correctly identify parts of speech and English tenses.
- Write grammatically correct and meaningful sentences.
- Produce sentences in terms of structure.
- Correct parallelism errors.
- Practice sentences dealing with action doers and receivers.
- Understand syllables, stress and clear pronunciation.
- Begin to create paragraphs, descriptive, compare and contrast essays.

Course Content:

1. Descriptive adjective and other parts of speech
2. Creating paragraphs and short stories using common tenses.
3. Sentence constructions
 - 3.1 Writing grammatically correct sentences
 - 3.2 Writing sentences with similar meanings using different structures
 - 3.2.1 Using the word "wish"
 - 3.2.2 Active and passive voices
 - 3.3 Practicing how to change sentence fragments
 - 3.3.1 Correcting run-ons into complete sentence forms
 - 3.4 Revising
 - 3.4.1 simple,
 - 3.4.2 compound,
 - 3.4.3 complex
 - 3.4.4 and compound-complex sentences.
 - 3.5 Combining sentences meaningfully
 - 3.5.1 Coordinating sentences
 - 3.5.2 subordinating sentences

4. Parallelism and modifiers
 - 4.1 Correcting parallelism errors
 - 4.2 Using modifiers in different contexts
5. Producing and developing Paragraphs
 - 5.1 Writing a topic sentence
 - 5.2 Revising for unity, coherence and support and sentence skills
 - 5.3 Developing different types of paragraphs
 - 5.3.1 process
 - 5.3.2 cause and effect, etc.
6. Introducing essays
 - 6.1 Considering purpose and audience
 - 6.2 Choosing a topic
 - 6.3 Narrowing the topic
 - 6.4 Types of essays
 - 6.4.1 Introducing descriptive essay and compare and contrast essays
 - 6.5 Developing an essay
 - 6.5.1 Thesis statement, body and conclusion
 - 6.5.2 Revising for unity, coherence and support and sentence skills
7. Fundamentals of spoken English
 - 7.1 Pronunciation, syllables and stress
 - 7.2 Speech skills
8. Reading skills
 - 8.1 Focus on language
 - 8.1.1 Identifying the tenses in the stories.
 - 8.1.2 Indicating verb form (imperative form, etc...
 - 8.2 Developing reading skills
 - 8.2.1 Finding message of the story
9. Listening
 - 9.1 Note taking and summarizing
 - 9.2 Interactive exercises
10. Language Lab
 - 10.1 Active reading
 - 10.2
 - 10.3 Communication skills 1 & 2
 - 10.4 Tense busters
 - 10.5 Clear pronunciations

Texts:

Primary Text:

1. Fawcett, S (2007) Evergreen: A Guide to Writing with Readings. Houghton Mifflin. USA.

Secondary Text:

1. Bucsemi, S.V. and Smith, C. (2007). 75 Readings: Anthology. 10th edition. New York: McGraw-Hill.
2. Boardman, C.A. and Frydenberg, J (2002). Writing to communicate: paragraphs and essays. 2nd edition. New York: Pearson
3. Fleming, L., (2005). Reading for results, 9th edition. New York: Houghton Mifflin.

4. Kennedy, X.J., Kennedy D.M. and Aaron, J.E. (2003). The brief Bedford Reader, 8th Edition. New York: Bedford.
5. Lebauer, R.S. (1988). Learn to Listen; Listen to Learn- an advanced ESL-EFL Lecture Comprehension and Note Taking text book. New Jersey: Prince Hall.
6. Level, B. (2001). Writing and Grammar: Communication in Action, New Jersey: Prentice Hall,
7. Wyrick, J., (2005) Steps to writing well, 6th Edition,

Teaching-Learning Methods: Student-centered learning through lectures, Language Labs, group work and assignments.

Evaluation Modalities:

| Modality | % |
|----------------------|------------|
| Class participations | 15 |
| Test 1 | 10 |
| Assignment | 20 |
| Common test 2 | 20 |
| Test 3 | 10 |
| Final Exam | 25 |
| Total | 100 |

Grade Specifics:

| Task | | % |
|----------------------|----------------------------------|------------|
| Class participations | Lectures | 10 |
| | Language Lab | 5 |
| Tests | Listening Test | 5 |
| | Short Speech | 5 |
| Assignments | Written Assignments x 5 | 20 |
| | Free Writing Assignment in class | 5 |
| | Language Lab Computer Project | 5 |
| Common test | | 20 |
| Final Exam | | 25 |
| Total | | 100 |

| | |
|-----------------------|------------------------------|
| Course Title: | English for Communication I |
| Course Code: | FLEN202 |
| Credit Hours: | 3 Lecture + 1 Language Lab |
| Prerequisites: | FLEN201 Basic Writing Skills |

Course Description:

This advanced writing skills course enables students to create and critically analyse business and academic written English. Various forms of English communication are studied, including: descriptive and process essays, professional letters, emails, summaries, memos and research reports.

During the course students are provided opportunities to produce high-quality academic reports ensuring they understand formal and informal styles, paraphrasing texts, plagiarism, incorporating evidence with proper documentation, topics, paragraphs and essay development

Listening and reading exercises provide students the chance to practice creating text and audio summaries with real-life English materials.

Course Objectives:

After completing the course students will be able to:

- Write paragraphs with clear topic sentences,
- Write essays with concise thesis statements, introductions and conclusions,
- Write clear and concise business letters, emails and memos,
- Efficiently paraphrase and summarize texts and audio information,
- and create high-quality evidence-based academic research papers that include international-standard referencing.

Course Content:

1. Planning and writing essays
 - 1.1 Narrative, persuasive, expository and descriptive,
 - 1.2 Information mapping,
 - 1.2.1 topic,
 - 1.2.2 subtopics,
 - 1.2.3 topic sentences,
 - 1.2.4 thesisstatement.
 - 1.3 Developing sentences using transitional words,
 - 1.4 Introductions, body paragraphs, conclusion.
2. Writing direct and indirect quotations.
3. Writing informal, formal and business letters.
4. Editing and writing
 - 4.1 email messages and memos,
 - 4.2 summaries,

- 4.3 research reports,
- 4.4 and proposals.
- 5. Introducing business communication
- 6. Paraphrasing texts and summarizing audio and written texts.
- 7. Reading exercises
 - 7.1 Reading for details,
 - 7.2 Reading for gist,
 - 7.3 Reading for specific purposes.
- 8. Listening exercises
 - 8.1 Oral answers for oral questions
 - 8.2 Written answers for oral questions
 - 8.3 Listening exercises for lecture note taking
- 9. Group presentation of a research paper
 - 9.1 Printed document (1000 words)
 - 9.2 Oral presentation
- 10. Language Lab
 - 10.1 Road to IELTS 4: writing 1 and 2
 - 10.2 BBC Learning English
 - 10.2.1 General and business English
 - 10.2.2 Talking business
 - 10.2.3 Presentations
 - 10.3 Study skills success (intermediate and advanced)
 - 10.4 Typing skills (using the software in the language lab)

Texts:

Primary Text:

- 2. Alerd, G.J., Brusaw, C.T. and Oliu, W.E. (2009). *Handbook of Technical Writing*. 9th ed. New York: St Martin's press.
- 3. Fawcett, S (2007). *Evergreen: A Guide to Writing with Readings*. Boston: Houghton Mifflin.

Secondary Text:

- 1. Alfred, G.,J. Brusaw, C. T. and Oliu, W. (2009), *The Business Writers Handbook*. 9th edition. Boston: St Martin's press.
- 2. Guffey, M. E., (2004), *Essentials of Business Communication*. 6thed, Ohio: Thomson South-Western.
- 3. Level, B. (2001). *Writing and Grammar: Communication in Action*, New Jersey: Prentice Hall,
- 4. Langan, J. (2008), *Exploring Writing: Sentences and Paragraphs*, 2nd , New York: McGraw Hill,
- 5. Merkel, M. (2010). *Technical Communication*. 9th ed. Boston: Bedford,
- 6. Memering, D. and Palmer, W. (2006). *Discovering Arguments, an Introduction to Critical Thinking and Writing with readings*. 2nded, New Jersey: Pearson.
- 7. Soles, D. (2005). *The Essentials of Academic Writing*. Houghton Mifflin, New York.

Teaching-Learning Methods: Student-centered learning through lectures, Language Labs, group work and assignments.

Evaluation Modalities:

| Modality | % |
|----------------------|------------|
| Class participations | 15 |
| Test 1 | 15 |
| Assignments | 15 |
| Test 2 | 10 |
| Common Test 3 | 20 |
| Final Exam | 25 |
| Total | 100 |

Grade Specifics:

| Task | | % |
|---------------------|----------------------------------|------------|
| Class participation | Lectures | 10 |
| | Language Lab | 5 |
| Classwork | Presentation of a Research Paper | 5 |
| | Text Summary Test | 5 |
| | Audio Summary Test | 5 |
| Assignments | Written Assignments x 5 | 15 |
| | Essay Writing in class | 5 |
| | Research Paper and presentation | 10 |
| Common Test | | 20 |
| Final Exam | | 25 |
| Total | | 100 |

| | |
|-----------------------|-------------------------------------|
| Course Title: | English for Communication II |
| Course Code: | FLEN301 |
| Credit Hours: | 3 Lecture + 1 Language Lab |
| Prerequisites: | FLEN202 English for Communication I |

Course Description:

This course provides students with the skills for effective communication specifically concentrating on public speaking, proposal writing and group activities. Through student-centered learning approach students will be provided the opportunity to practice audience and purpose identification, speech planning, use of visual aids and persuasive performance.

Students will give presentations of varying lengths, conduct research, write proposals relevant to their field of study and present research using audio visual equipment. They will also conduct group meetings in which they negotiate issues, apply critical thinking to decision-making, deal with conflict respectfully and use English conversational conventions.

Participants will also be allowed the opportunity to develop specific business skills vital for their future employment including creating their resume and preparing for job interviews.

Course Objectives:

At the end of the course students will be able to:

- Communicate clearly, correctly and appropriately with others through spoken and written English.
- Critically understand the importance of effective communication.
- Prepare presentations with an awareness of audience and purpose.
- Evaluate and refine presentations for crucial and persuasive information.
- Produce effective presentations with and without AV materials.
- Show effective listening skills in different cultures.
- Employ active communication strategies such as giving and receiving feedback.
- Apply critical thinking and decision-making skills to technical tasks.
- Work effectively in small groups.
- Write a professional resume and cover letter.

Course Content:

11. Basics of English communication
 - 11.1 Philosophy, meaning, significance and styles of communication
 - 11.2 Communication skills: receptive and productive
 - 11.3 Critical analysis and discussion of famous speeches
12. Audience-centered approach to communication

- 12.1 Audience analysis
- 12.2 Purpose identification: inform or persuade
- 13. Developing presentations
 - 13.1 Preparation: gathering, sorting and selecting information
 - 13.2 Using informational or persuasive strategies to fit purpose
 - 13.3 Short speeches
- 14. Final presentation preparation
 - 14.1 Editing for purpose, audience and time
 - 14.2 Outlining and creating presentation notes
 - 14.3 Audio Visual Aids
 - 14.4 Rehearsing: memorization, timing, visual aids, technology, feedback
- 15. Speech delivery
 - 15.1 Vocal characteristics: volume, tone, pitch, pronunciation and articulation
 - 15.2 Non-verbal characteristics:
 - 15.2.1 eye contact,
 - 15.2.2 expressions,
 - 15.2.3 posture, movement and gestures
 - 15.3 Maintaining audience focus
- 16. Working within small groups
 - 16.1 Effective participation:
 - 16.1.1 conversation skills,
 - 16.1.2 rule-based structures,
 - 16.1.3 non-verbal communication.
 - 16.2 Leading groups, managing meetings, setting agendas
 - 16.3 Problem solving through negotiation, critical thinking and collaborative writing
 - 16.4 Group presentations
- 17. Research-based proposal
 - 17.1 Selecting and narrowing the topic
 - 17.2 Research, investigation and note-taking
 - 17.3 Developing the report
- 18. Employment skills
 - 18.1 Resume writing: planning, language and formatting
 - 18.2 Purposeful introductory letters
 - 18.3 Communication for job interviews

Texts:

Primary Texts:

1. Beebe, S. A. & Beebe, S. J. (2006). Public Speaking: An Audience-Centered Approach. Florida: Pearson Education.
2. Lucas, S. (2009). The art of public speaking. 10th edition, New York: McGraw Hill.
3. Markel, M. (2010). Technical Communication. 9th edition. Boston: Bedford.

Secondary Texts:

4. Shatzman, B.T. (2003). Business Communication Today. 7th edition. New Jersey: Prentice Hall.
5. Thill, J.V. and Povee, C.L. (2005). Excellence in Business Communication. 6th edition. New York: Prentice Hall.

6. Zarefsky, D. (2002). Public Speaking Strategies for success. Boston: Prentice Hall.
7. Ober, S. (2000). Contemporary Business Communication. 4th edition. Boston: Houghton Mifflin.
8. Guffey, M.E. (2004). Essentials of business communication. 6th edition. Ohio: Thomson South-Western
9. Baker, W.H. (2007). Writing and Speaking for Business.

Teaching-Learning Methods: Student-centered learning through lectures, Language Labs, groupwork, presentations and assignments.

Evaluation Modalities:

| Modality | % |
|----------------------|------------|
| Class participations | 15 |
| Group work | 20 |
| Assignments | 20 |
| Common Test | 20 |
| Final Exam | 25 |
| Total | 100 |

Grade Specifics:

| Task | | % |
|----------------------|--------------------------------------|------------|
| Class participations | Lectures | 10 |
| | Language Lab | 5 |
| Group work | Interview Role-Play | 2 |
| | Group Discussion | 4 |
| | Individual Short Speech | 5 |
| | Group Research Proposal Presentation | 10 |
| Assignments | CV and Introductory Letter | 4 |
| | Research Proposal | 5 |
| | Written Assignments x 5 | 10 |
| Common Test | | 20 |
| Final Exam | | 25 |
| Total | | 100 |

Course Title: General Psychology
Course Code: PSYC 201
Credit Hours: 3
Prerequisites: None

Course Description:

This survey course explores the scientific study of human nature, behavior and cognitive processes. The major areas of psychological study will be reviewed, including history, biology, memory, learning, development and personality, abnormal psychology and social psychology. Emphasis will be placed on applying psychological principles and data to life experience. Students will learn to understand the psychological foundations of human behavior in all occupations. They will learn how to apply psychological principles and concepts in order to overcome human and environmental barriers to effective relationships. Topics to be covered include motivation, emotion, knowledge retention, group dynamics, worker efficiency, sensation and perception, personality, and development of attitudes. Students will complete the proficiency task of developing a personal statement of goals and values.

Course Objectives:

Upon satisfactory conclusion of this course, students will have developed the ability to:

- Understand human behavior and relationships in different professions and in life at large
- Apply knowledge gained from the course in the areas of business, government and education
- Understand the major factors that influence group and individual decision-making
- Understand effective human and environmental relationships
- Use knowledge of psychology to develop a personal statement of goals and values

Course Contents:

Chapter 1 Introduction

- 1.1 Definition
- 1.2 Psychology as a Science,
- 1.3 Major sub fields of psychology
- 1.4 Application of Psychology

Chapter 2 Psychology of Adolescence

- 2.1 Adolescence and puberty
- 2.2 Goals of the adolescent period
- 2.3 Symptoms of abnormal behaviour
- 2.4 Social life of School

Chapter 3 Theories of Intelligence

- 3.1 Growth of intelligence
- 3.2 Measurement of intelligence

Chapter 4 Personality Development

- 4.1 Personality characteristics
- 4.2 Basic Assumption about people
- 4.3 Basic Traits
- 4.4 Basic human needs

- 4.5 Personality measurement
- 4.6 Motives
- 4.7 Relationships and conflicts

Chapter 5 Leadership Philosophy

- 5.1 Meaning
- 5.2 Nature of leadership
- 5.3 The individual
- 5.4 The followers
- 5.5 Complex

Chapter 6 Vocational Adjustment

- 6.1 Employee selection methods
- 6.2 Job analysis
- 6.3 6.3 Worker characteristics

Chapter 7 Psychological Measurement

- 7.1 Kinds of measurement
- 7.2 Tests

Method of Teaching

Lectures, Assignment, class works, and group discussions

Assessment:

| | |
|---|-------------|
| ◆ Continuous Assessments(quizzes, tests, assignments, class activities, etc) | 60% |
| ◆ Final Exam | <u>40%</u> |
| Total | 100% |

Text Book:

Kalat, James. Introduction to Psychology, 8th ed. Wadsworth, 2008

References:

1. Weiten, Wayne, Diane Helpem. Psychology: Themes and Variations: with Concept Charts. Briefer Edition, 7th ed. Thomson-Wadsworth, 2007
2. Psychology: A Modular Approach to Mind and Behavior, 10e, Dennis Coon, 2006.
3. Psychology, Stephen Davis and Joseph Pallidino, 4e, 2003
4. The Essential World of Psychology, Samuel Wood and Ellen Green Wood, 2002.
5. Psychology: A Journey, Dennis Coon, 2002.
6. Psychology, 7th ed., John Santrock, 2005

Course Title: Leadership Skills
Course Code: MAEN441
Credit Hours: 3
Prerequisites: None

Course Description:

This course challenges students to be leaders as leadership is in each and every one. The course outlines how one identifies one's leadership niche and helps one cultivate what one may have to offer as a leader. The course provokes students to think critically about their future life path and in so doing encourages students to find themselves in a world of leaders. In initiating students to such self-discovery, the course encourages students to be committed to certain steps of personal transformation that would set them as leaders. The course uses competency based training as an approach. Concepts are revealed and discussed and applications are attempted within a mock arrangement. Students will then be required to explore leadership qualities within the work environment. Cases shall be used as examples of real life situations for leadership exercises, and speakers invited to talk about their own leadership journeys.

Course Objectives:

The course shall impress upon each student that each is a leader and with this awareness the course shall encourage students to work on their leadership niche. The course shall then impress upon students the attitudinal changes that they need to make and the life goal paths that they should explore.

Course Content:

Chapter 1: Introduction

- 1.1. Definition of Leadership
- 1.2. Description of Leadership

Chapter 2: Approaches to Leadership

- 2.1. Trait Approach
- 2.2. Skills Approach
- 2.3. Style Approach

Chapter 3: Theories of Leadership

- 3.1. Contingency theories
- 3.2. Path-Goal Theory
- 3.3. Leader-member exchange theory

Chapter 4: Types of Leadership

- 4.1. Transformational Leadership
- 4.2. Authentic Leadership
- 4.3. Team Leadership
- 4.4. Servant Leadership
- 4.5. The practices of exemplary leadership

Chapter 5: Other Contemporary issues of Leadership

- 5.1. Women Leadership
- 5.2. Culture and Leadership

Teaching Methods:

Lecture, Discussions, Demonstrations and Presentations.

Assessment:

| | |
|-------------------------------|------------|
| ◆ Continuous Assessment: | |
| ○ (Leadership activities) | 20% |
| ○ Leadership Self- Assessment | 20% |
| ○ Tests and Quizes | 30% |
| ◆ Final Examination | <u>30%</u> |
| Total | 100% |

Text Books:

1. Northouse, Peter G, 2010, Leadership: Theory and Practice, 5thed, New Delhi: SAGE Publications India Pvt. Ltd.
2. Focus on Leadership: Servant Leadership for 21st Century, Ken Blanchard
3. Awakening the Leader Within: A Story of Transformation, KavinCashman, Jack Forem
4. The Purpose-Driven Life, Rick Warren, 2002

References:

1. Principle-Centered Leadership, Steven Covey, 1991
2. Leadership Challenges, Kouzes and Posner, 4th Ed, 2008
3. Leadership: Courage in Action, Robert Terry, 1999.
4. Leadership: Theory and Practice, Northouse, 9th Ed, 2009

| | |
|-----------------------|---|
| COURSE TITLE: | APPLIED PHYSICS |
| COURSE NUMBER: | PHYS 201 RESPONSIBILITY: CROSSCUTTING |
| CREDIT HOUR: | 3 |
| PREREQUISITE: | CO-PREREQUISITE WITH MATHEMATICS I |

Course Description:

The purpose of this course is to reinforce previous learning of physics by focusing on the applied physics needed as support for the technical courses students will be taking in advanced studies. The theoretical work will be supported by a series of practical laboratory exercises. The topics covered include applications in 1-d and 2-d motion, forces, energy and momentum, torque and center of mass, statics, wave motion and sound, heat and temperature, electric charge, electric potential, electric current and magnetism.

Course Objectives:

After completing this course, students should be able to:

- Discuss the physical world based on a broad understanding of how it works
- Apply physics concepts when taking the technical courses where this skill is needed
- Reinforce past learning through performing practical exercises in important areas of physics
- Solve problems by using trouble shooting skills
- Apply skill in working with instruments including data acquisition systems.
- Be curious about the physical world and want to know more about it

Textbook:

J.D. Wilson et al., College Physics, 6th Edition, 2007 and 7th Edition, 2009

Reference

1. How Things Work The Physics of Everyday Life, L. Bloomfield, 2nd Ed., 2001, 12 copies
2. Physics with Vernier, K. Appel, et al.
3. Physical Science, B. Tillery, 6th Ed. 2005, 7 copies

Teaching Methods

Lectures, demonstrations and class discussion

Supervised laboratory exercises

Assignments and lab reports

Assessment/Evaluation

| | |
|------------------------------------|-----|
| Laboratory Reports | 15% |
| Weekly assignments | 10% |
| Attendance and class participation | 5% |
| Two Tests | 30% |
| Final Examination | 40% |

Specific Competencies

Ability to apply physical concepts for logically and critically analysis

Have an active curiosity and eagerness to learn

Ability to use a logical approach in trouble shooting and solving problems

PHYS 201 Applied Physics 3 Cr. (2 hrs. Lectures, 2 hrs. Laboratory)

| Course Topic | Weeks | Tests |
|--|--------------|---------------------------|
| 1. Motion in one Dimension | 2 | |
| 1.1 Math review | | |
| 1.2 Measure and units | | |
| 1.3 Displacement, velocity, acceleration | | |
| 1.4 Motion with constant acceleration | | |
| 2. Motion in two Dimensions | 1 | |
| 2.1 Review of vectors and trigonometry | | |
| 2.2 Displacement, velocity and acceleration vectors | | |
| 2.3 Acceleration of gravity | | |
| Laboratory – Start 1 st cycle of 5 experiments | | |
| One Dimensional Motion | | Static Equilibrium |
| Two Dimensional Motion | | Sound Waves |
| Acceleration of Gravity | | |
| 3. Force and Motion | 2 | |
| 3.1 Force | | |
| 3.2 Newton’s three Laws | | |
| 3.3 Friction | | |
| 4. Work and Energy | 2 | |
| 4.1 Potential and kinetic energy | | |
| 4.2 Conservation of energy | | |
| 5. Linear Momentum and Collisions | 1 | |
| 5.1 Conservation of momentum | | |
| 5.2 Collisions | | |
| Complete 1 st cycle of experiments | | |
| 6. Temperature and Kinetic Energy | 2 | |
| 6.1 Temperature | | |
| 6.2 Kinetic theory of gases | | |
| 6.3 Heat | | |
| 7. Electric Charge and Fields | 2 | |
| 7.1 Voltage, current and resistance | | |
| 7.2 Series and parallel circuits | | |
| 7.3 Capacitance | | |
| 7.4 RC circuits | | |
| Laboratory - Start 2 nd Cycle of five experiments | | |
| Conservation of Energy | | Capacitor Discharge |
| Conservation of Momentum | | Measuring Magnetic Fields |
| DC Circuits and Solar Cells | | |
| 8. Magnetism | 2 | |
| 8.1 Magnetic fields | | |
| 8.2 Magnetism and current | | |
| 8.3 Magnetic materials | | |
| 9. Electromagnetic Induction | 1 | |
| 9.1 Induction | | |
| 9.2 Transformers | | |
| 9.3 Electromagnetic waves | | |
| Complete 2 nd cycle of experiments | | |
| | | Final Examination |