Hope University College

CURRICULUM

Faculty of Science and Technology

Department of Building Construction Technology

May, 2010

Hope University College

Addis Ababa

Table of Contents

Curriculum for Building Construction Technology

Curriculum for Building Construction Technology

1.0 INTRODUCTION

The Building Construction Technology program of HUC is designed to provide the skilled man-power requirements for the construction industry; which is the largest industry in Ethiopia. The building industry provides employment and business opportunity to many and continues to grow. Building Construction Technology graduates are in great demand by construction firms, contractors in all types of construction industries, and government and non-governmental organizations that have continuing infrastructural plans in the community. Positions available to our graduates include: Construction Superintendent, Project Manager, Sales Person, Site Engineer, Cost Engineer, Design Engineer, Safety Engineer, Material Engineer, and Construction Company Executive. Graduates will also be in demand in such government sectors as the Municipality, Urban Development, Transport Construction Design Share Company, Construction Enterprise and so on. Knowledge of building construction technology is important for the construction industry because it provides the design, planning and costing skills needed from the office to the field.

Graduates will be qualified in the areas of construction programming and management, cost control, construction quality and design for all building projects. This is a unique program in the country preparing nationally competitive building construction technologists for a successful career in construction. The program is also designed to provide educational, research and outreach opportunities serving both the needs of students and those of the construction industry.

2.0 VISION, MISSION, AIM, AND OBJECTIVES

2.1 VISION STATEMENT

The vision of the Building Construction Technology Department is to be a renowned source of construction managers, concepts, and technologies through learning, engagement and discovery partnerships with business and industry.

2.2 MISSION STATEMENT

The mission of the Department of Building Construction Technology is to accomplish the following:

- Provide academic and applied educational opportunities designed to advance the profession of construction management;
- Prepare practitioners, managers, and leaders in the field of applied construction through learning, discovery, engagement and practical experience to develop skills;
- Engage in scholarly activities that keep the Department at the state-of-the-art level in application; and
- Provide service and outreach activities to the construction profession

2.3 AIM

The aim of the curriculum of the Department of Building Construction Technology is to further students' knowledge and skill in structural design and construction with emphasis on materials currently in use in Ethiopia but also looking to incorporate new materials and construction methods.

2.4 OBJECTIVES

The main objectives of the Building Construction Technology program are to:

- enable students to develop the basic skills necessary to plan, organize and control resources in order to manage the overall construction process efficiently.
- train graduates prepared for career opportunities with general contractors, subcontractors, material suppliers or other industry related businesses;
- equip students with knowledge and skills necessary to identify, define and compare building design alternatives;
- provide opportunities, skills and encouragement to pursue life-long learning within the broader societal context of the construction profession;
- equip graduates for supervisory, administrative and management responsibilities coupled with technical hands-on knowledge;
- prepare graduates who will qualify for positions such as office engineer, field engineer, safety engineer, superintendent, project engineer, foreman, estimator, scheduler, expediter, quality control engineer, inspector or independent contractor;
- prepare project managers who are responsible for project documentation, communications, coordination of work, material control, submittal reviews, updates of the progress schedule, and ready to work on cost control and project close out;

- prepare project superintendents who are responsible for site layout, establish grade elevations, establish layout controls, building layout, quality control, assist in site supervision, coordination of work, and safety supervision.

3.0 GRADUATE AND PROGRAM PROFILE

All HUC graduates shall exhibit the following General Competencies:
Personal Accountability: responsible for actions, at work and in society at large

Self-regulation: reflecting critically on the professional work of the student, and adjusting to finish tasks successfully.

Intellectuality: working scientifically, using analytical skills, to develop and carry out research valuable to the country's needs and development, writing and presenting the results in a clear and coherent manner; and valuing continual self-development through lifetime learning to cope with an environment of continuous change and a rapidly evolving society;

Leadership: able to lead people in the right direction by combining humility and respect for all people with integrity, strategy, motivating skills, a strong work ethic and an attitude of service; also able to serve as a leader in local, and national arenas.

Building construction technology deals with the planning and management and construction of structures; such as: buildings, dams and reservoirs. Graduates in Construction Technology are expected to engage in supervisory, administrative and management responsibilities coupled with technical hands-on knowledge.

3.1 PROFESSIONAL PROFILE

Graduates will have Knowledge and Understanding of:

- analyzing reports;.
- analyzing drawings, blue prints, aerial photographs and other sources of information;
- estimating costs of construction projects and tracking its budget;

Graduates will have Practical Skills in:

- managing and supervising construction projects.
- designing and building structures such as buildings, bridges, and so forth
- testing the strength and property of construction materials such as: soil, concrete
- selecting appropriate materials for construction.

Graduates will have transferable skills in:

- developing a hypothesis for a problem they face on site and suggesting a solution.
- providing construction information including needed repairs and cost changes to the managers.

3.2 PROGRAM PROFILE

The Department of Building Construction Management at HUC will be a preeminent high-class program in applied construction. The Department of Building Construction Technology will be recognized for its excellence in:

- Creating and delivering a degree program in applied construction through learning, discovery, and engagement that draw nationwide attention to its outcomes;
- Designing programs for learners of exceptionally high intellectual and creative accomplishment;
- Forging effective interdisciplinary and collaborative partnerships in the university community that create models for such endeavors;
- Partnering with public and private enterprise in the nation and abroad as a model for serving common objectives; and
- Recruiting, enhancing, and retaining a highly-renowned department and staff.

4.0 TEACHING METHODS & PHILOSOPHY

4.1 TEACHING METHODS

The teaching methods involve class room lectures, laboratory and workshop activities, field work and excursions. Students will also engage in seminar presentation, project execution and involvement in community work. Special attention will be given to integrating knowledge and professional skills so that the graduates are prepared for leadership in their fields.

4.2 TEACHING PHILOSOPHY

Based on the mission of HUC and the outcomes of the interviews with relevant stakeholders, the following elements are in the curriculum:

- Excellence in applying scientific knowledge in a professional setting
- Continual interaction between faculty, students and professional learning environments
- Integration of theory and practice with the purpose to become excellent professionals
- Participation from stakeholders to create a challenging and practical curriculum
- Competencies as an important outcome of the curriculum
- Integration of teaching and coaching with a focus on talent development of the student.

Graduates of HUC will make a difference through a balance of the following elements

- **Knowledge & skills**
  Their professional activities are based on knowledge and skills that will help to contribute to the professional setting in which they are working.
- **Values & vision**.
  Their professional activities should be based on integrity and a strong conviction about major issues in professional activities.
- **Personality & professionalism**
  The student's professional activities are based on a balance of self knowledge from reflection on the one hand and eagerness to function in a professional way on the other.

Stressing these three elements underlines the importance of a holistic approach using a competency based curriculum. This modern concept of competency 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 comptences will be tested at several levels during all years. 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/philosophical tools to explore available knowledge and develop a moral and intellectual maturity for better judgement, leadership and knowledge ability.

5.0 ASSESSMENT METHODS

- Written examinations: Mid-term and final exams, quizzes, etc.
- Practical exams: seminars, paper writing, skill demonstrations,
- Evaluation of laboratory/workshop work.

6.0 ADMISSION REQUIREMENTS

After a successful completion of the preparatory program:

- As per the regulations of Ministry of Education,
- As per the senate legislation of the University, or
- A pass in entrance examination set by the department

7.0 DURATION OF THE STUDY

The duration of study for a BSc. in Building Construction Technology is four years

8.0 DEGREE NOMENCLATURE

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

- In English – “Bachelor of Science Degree in Building Construction Technology’
- In Amharic – “የሳይንስ ባችለር ዲግሪ በሕንፃ ኮንስትራክሽን ቴክኖሎጂ”

9.0 GRADUATION REQUIREMENT

Graduating students shall be awarded the “Bachelor of Science Degree in ‘Building Construction Technology’ if they fulfill the following requirements:

- A minimum credit hour of 142
- A minimum Cumulative Grade Point Average of 2:00
- A minimum Cumulative Grade Point Average of 2:00 in core courses

- No F, NG, I, in any course and
- Compliance with the regulations of the University

10.0 COURSE CODING

Course Code used has a four-letter prefix and a three-digit number.

- The prefix which represents the department is assigned to all core courses in the department. If a core course is the responsibility of another department, it will be assigned a new number in the current department, but both codes will be shown on the course description to indicate that they actually are the same.
- The first digit represents the year in which the course is offered by the responsible department (year at college starts with 2).
- The second digit distinguishes the course from other core courses offered in that semester.
- The third digit indicates the semester in which the responsible department offers the course to its students.

11.0 QUALITY ASSURANCE - Maintaining the Quality of the Program

To maintain the quality of the program a formative review and revision should be done regularly by the curriculum revision task force of the Department. The Department needs also to do a summative review of the program after four years of implementing this curriculum by collecting feedback from employers and graduates of the program. This formative and summative program 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 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 work (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.

12.0 GRADING SYSTEM

The grading system is a five scale grading system ranging from A to F and the respective grade points are presented below.

Grade	A^+	A	A^-	B^+	B	B^-	C^+	C	C^-	D^+	D	D^-	F
Value	4.00	4.00	3.75	3.50	3.00	2.75	2.50	2.00	1.75	1.50	1.00	0.75	0.00

13.0 LIMITATION OF THE CURRICULUM

The Building Construction Technology program combines building skills with skills in business and communication in order to play a leadership role in the construction business. Hence, he/she will take fewer construction-related courses than a civil engineer. In addition to technology courses, at HUC students will take courses that enhance leadership skills and character development, business skills, and additional English courses to advance the graduate's communication skills. As a result, there may be time limitations in addressing all the courses deemed necessary for civil engineers.

14.0 RESOURCE REQUIREMENTS

14.1 TEACHING STAFF

The quality of the training to be provided is very dependent on the skill and excellence of its staff members. Therefore, the HUC Senate has placed great emphasis on this aspect. Consequently, some volunteer expatriate staff will provide quality education in areas where there is a deficiency. Also, HUC is recruiting qualified local staff with masters degrees and above, who possess good credentials and appropriate experience.

14.2 LIBRARY AND COMPUTER FACILITIES

HUC has built a spacious, state-of-the-art library with modern facilities and books. Relevant, recent books are coming from overseas for the library and reserve shelves, intended for the use of both students and staff. Up to date computer laboratories will be available for the students in the library and throughout the campus, and all students will be instructed in basic computer skills needed for class work. Students will thus have access to the internet and can get additional assistance in their studies from web-based sources. E-books and E-learning. With these facilities, HUC will certainly rate as one of the best university colleges in the country.

14.3 LABORATORY AND WORKSHOP FACILITIES

HUC will have its own facilities on campus for all workshop tasks in the curriculum. Hope Enterprises possesses one of the best workshops in the country with facilities that are useful for electrical, industrial, manufacturing, and civil engineering purposes. This knowledge and expertise will be invaluable in the launching of the University College facilities.

14.4 RECREATIONAL AND SPORTING FACILITIES

HUC will provide students opportunities to have recreation and leisure during their free time. There is a state of the art auditorium where students could attend dramas, public debates, or speeches by renowned figures. They can also enjoy indoor and outdoor sports and games in the facilities and grounds. HUC's motto is to develop students of good character and stature.

15.0 CLASS SIZE

To assure the continuous assessment policy, the optimal class size shall be:

- For classes that require student discussion – up to 40 per class
- For lecture type courses – 80 students per class
- For lab and skill based courses – 24-30 students per class

16.0 PROGRAM STRUCTURE

The Building Construction Technology program is designed to be completed within eight semesters. Each semester shall have 16 weeks of regular classes. Additionally there shall be one internship programs at the end of the third academic years for two and a half months, where students will have a chance to work in practical building construction projects.
This real world experience will help the students to link theory and practice and have a vision of the skill, discipline and ethics demanded in building construction work. The major compulsory courses, supportive and general education courses for this program are presented below.

Table 1: List of major courses for B. Sc. in Building Construction Technology

COURSE NO.	COURSE TITLE	Cr. Hrs.	Lec. Hrs.	Lab. Hrs.
BCTE 211	Building Materials and Methods I	3	3	-
BCTE 212	Building Materials and Methods II	3	3	-
BCTE 221	Technical Drawing with Sketching	2	1	2
BCTE 222	Computer Aided Technical Drawing	2	1	2
BCTE 232	Engineering Mechanics (Statics)	3	2	2
BCTE 311	Building Construction & Workshop Training I	4	2	4
BCTE 312	Building Construction & Workshop Training II	4	2	4
BCTE 321	Fundamentals of Surveying	3	2	2
BCTE 322	Computer Aided Construction Drawing	2	1	2
BCTE 331	Strength of Materials	3	2	2
BCTE 332	Hydraulics	3	3	-
BCTE 341	Theory of Structure I	3	3	-
BCTE 342	Theory of Structure II	3	3	-
BCTE 352	Construction Quality Management	3	3	-
BCTE 362	Basic Electricity	3	2	2
BCTE 411	Building Maintenance	3	2	2
BCTE 412	Construction Contract Administration	3	3	-
BCTE 421	Fundamentals of Soil Mechanics	3	2	2
BCTE 422	Construction Project Management	3	3	-
BCTE 431	Reinforced Concrete Design	4	3	2
BCTE 432	Construction Site Supervision	3	2	2
BCTE 441	Cost Estimation, Quantity Surveying, and Specification	3	2	2
BCTE 442	Design of Timber and Steel Structure	3	2	2
BCTE 451	Structural Design	3	3	-
BCTE 452	Water Supply and Sanitation	3	2	2
BCTE 462	Internship	3	-	-
BCTE 511	Architectural Planning and Design	3	2	2
BCTE 512	Building Economics and Finance	3	3	-
BCTE 521	Construction Methods and Equipment	3	2	2
BCTE 522	Construction Health, Safety and Security	3	3	-
BCTE 531	Fundamentals of Foundations	2	1	2
BCTE 532	Construction Law	3	3	-
BCTE 541	Building Repair and Renovation	3	2	2
BCTE 542	Senior Project	3	-	6
	Total	**101**		

Table 2: List of support courses for B. Sc. in Building Construction Technology

No.	COURSE NO.	COURSE TITLE	Cr. Hrs.	Lec. Hrs.	Lab. Hrs.
1	MATH 205	Applied Mathematics I	4	3	2
2	MATH 206	Applied Mathematics II	4	3	2
3	STAT 301	Introduction to Probability & Statistics	3	3	-
6	MAEN 211	Introduction to Entrepreneurship	3	3	-
7	MAEN 212	Introd. to Business Management	3	3	-
10	PHYS 202	Physics Lab	3	2	2
		Total	20		

Table 3: List of Crosscutting courses for B. Sc. in Building Construction Technology

No.	COURSE NO.	COURSE TITLE	Cr. Hrs.	Lec. Hrs.	Lab. Hrs.
1	FLEN 201	Sophomore English	3	3	1
2	FLEN 202	Professional Writing	3	3	1
3	FLEN 301	Communication & Presentation Skills	3	3	1
4	COMP 201	Introduction to Computer Applications	3	2	2
5	ECON 204	Introduction to Economics	3	3	-
6	PSYC 201	General Psychology	3	3	-
7	CEED 201	Civic and Ethical Education	3	3	-
8	LEAD 501	Leadership Skills	3	3	-
		Total	24		

Table 4: Summarized table indicating the proportions of credit hours in Building Construction.

Course Category	Total Credit Hour
Major Compulsory	101
Supportive	20
Crosscutting	24
Grand Total	145

COURSE OFFERINGS (*Sequencing courses by semester*)

Table 5: Course offerings by semester of the four year undergraduate degree program in Building Construction Technology.

Year	***Semester I***		
1 Year	***Course No***	***Course Title***	***Cr Hr***
	MATH 205	Applied Mathematics I	4
	BCTE 211	Building Materials and Methods I	3
	CEED 201	Civic & Ethical Education	3
	COMP 201	Introduction to Computer Applications	3
	FLEN 201	Sophomore English	3
	BCTE 221	Technical Drawing with Sketching	2
		Semester Total	**18**
	Semester II		
	MATH 206	Applied Mathematics II	4
	BCTE 212	Building Materials and Methods II	3
	BCTE 222	Computer Aided Technical Drawing	2
	BCTE 232	Engineering Mechanics (Statics)	3
	PHYS 202	Physics Lab	3
	FLEN 202	Professional Writing	3
	Semester I		**18**

Year	***Semester I***		
2	***Course No***	***Course Title***	***Cr Hr***
	BCTE 311	Building Construction and Workshop Training I	4
	BCTE 321	Fundamentals of Surveying	3
	STAT 301	Introduction to Probability and Statistics	3
	FLEN 301	Presentation and Communication Skills	3
	BCTE 331	Strength of Materials	3
	BCTE 341	Theory of Structures I	3
		Semester Total	**19**
	Semester II		
	BCTE 362	Basic Electricity	3
	BCTE 312	Building Construction and Workshop Training II	4
	BCTE 322	Computer Aided Construction Drawing	2
	BCTE 332	Hydraulics	3
	BCTE 342	Theory of Structure II	3
	BCTE 352	Construction Quality Management	3
		Semester Total	**18**

Year	*Semester I*		
3	***Course No***	***Course Title***	***Cr Hr***
	BCTE 411	Building Maintenance	3
	BCTE 421	Fundamentals of Soil Mechanics	3
	PSYC 201	General Psychology	3
	BCTE 431	Reinforced Concrete Design	4
	BCTE 441	Specification, Quantity Surveying and Cost Estimation	3
	BCTE 451	Structural Design	3
		Semester Total	**19**
	Semester II		
	BCTE 412	Construction Contract Administration	3
	BCTE 422	Construction Project Management	3
	BCTE 432	Construction Site Supervision	3
	BCTE 442	Design of Timber and Steel Structure	3
	MAEN 211	Introduction to Entrepreneurship	3
	BCTE 452	Water Supply and Sanitation	3
		Semester Total	**18**

BCTE 462 **Internship** (**Summer**) **3**

Year	*Semester I*		
4	***Course No***	***Course Title***	***Cr Hr***
	BCTE 511	Architectural Planning and Design	3
	BCTE 521	Construction Methods and Equipment	3
	BCTE 531	Fundamentals of Foundations	3
	MAEN 212	Introduction to Business Management	3
	ECON 204	Introduction to Economics	3
	BCTE 541	Building Repair and Renovation	3
		Semester Total	**18**
	Semester II		
	BCTE 512	Building Economics and Finance	3
	BCTE 522	Construction Health, Safety and Security	3
	BCTE 532	Construction Law	3
	LEAD 501	Leadership Skills	3
	BCTE 542	Senior Project	3
		Semester Total	**15**
	GRAND TOTAL (Credit Hours)		**145**

COURSE DESCRIPTIONS FOR MAJOR COURSES

COURSE TITLE: **BUILDING MATERIALS AND METHODS I**
COURSE NUMBER: **BCTE 211**
CREDIT HOUR: **3**
PREREQUISITE: **NONE**
Course Description

This course offers an overview of building materials and processes. Topics include financing, design, project safety and quality plans, site preparation, building and finishing. An introduction to building materials includes those common in Ethiopia such as concrete: and concrete blocks. Other building materials are included such as metals, clay bricks (raw materials, method of production properties and uses). hollow and solid concrete blocks, stabilized soil blocks and building stone. Field work will consists of field trips to observe building methods and sources of materials.

Course Objectives

Upon completion of the course, the student should have a basic understanding of the building process and the common materials of construction and how they fit together to comprise the total building.

Textbooks

1. Edward Allen and Joseph Iano. 2008. Fundamentals of Building Construction: Materials and Methods (5^{th} ed.). 1008 pages. ISBN-10 047007468X.

References

1. Chudley, R. and Roger Greeno. 2005. Construction Technology. 634 pages. ISBN-10 0131286429.
2. Civil engineering Materials Dr.S.V.Deodhar, 2003, 3rd edition, Delhi
3. Fundamentals of Building Construction: Materials and Methods 5^{th} ed. 2008 Allen, E. and Iano J.

Assessment/Evaluation

	Percent
Quizzes	10%
Mid-Exam	20%
Final Exam	40%
Field work	30%

COURSE TITLE: **BUILDING MATERIALS AND METHODS II**
COURSE NUMBER: **BCTE 212**
CREDIT HOUR: **3**
PREREQUISITE: **BUILDING MATERIALS AND METHODS I**

Course Description

This is a continuation of Building Materials and Methods I and focuses on types of construction and materials used. Topics include reinforced concrete and steel and wood frame, newer building materials such as ferrous metals and alloys, non-ferrous metals, timber and asphalt. The course covers mechanical properties and durability of timber, common Ethiopian timber and asphalt types. Newer materials such as glass, polymers, composites, and fiber reinforced concrete are also covered. Field trips to see modern construction is an important part of the course.

Course Objectives

Students gain an understanding of the types of building structures, and the properties of common and modern construction materials such as wood, iron and steel, glass, polymers and composites.

Textbooks

1. Edward, A. and Joseph Iano. 2008. Fundamentals of Building Construction: Materials and Methods (5th ed.). 1008 pages. ISBN-10 047007468X.

Books/References

1. Chudley, R. and Roger Greeno. 2005. Construction Technology. 634 pages. ISBN-10 0131286429.
2. Abebe Dinku, Construction Materials Laboratory Manual

Assessment/Evaluation

	Percent
Quizzes	10%
Mid-Exam	20%
Final Exam	40%
Field work	30%

COURSE TITLE: **TECHNICAL DRAWING WITH SKETCHING**
COURSE NUMBER: **BCTE 221**
CREDIT HOUR: **2**
PREREQUISITE: **NONE**

Course Description

A course on technical drawing with sketching allows the student to learn the techniques of drawing while gaining skills in sketching that are useful in communicating visually. The student will learn the technical language of drawing by using the standard international conventions of drawing that bridge the gap between a drawing and reality. The student applies what is learned through sketching as a preparation for future work on computer aided drawing.

Course Objectives

At the end of the course, students would be able to:

- understand the different types of projection techniques
- understand technical drawing terms and techniques
- apply standard symbols
- use conventional dimensioning technique
- read existing drawings
- sketch auxiliary and sectional views as a supplement of multi – view drawings.
- draw simple objects using a CAD systems

Textbooks

1. Besterfield, D. 2006. Technical Sketching with an Introduction to AutoCAD (4th ed.). 464 p. ISBN-10 012432781.

References

1. Giesecke, F. E., Alva Mitchell, H. C. Spencer, et al. 2008. Technical Drawing (13th edition). Prentice Hall. ISBN-10: 0135135273. 912 pages.
2. Sam Kubba, Blueprint Reading: Construction Drawing for the Building Trades, 2008, 384 pages, ISBN 10: 0071549862.
3. Architectural Graphics 2009 by Ching, F.D.
4. Technical Sketching with an Introduction to AutoCAD 4th ed. 2006 Besterfield, D

Assessment/Evaluation

Assignments and Class work	60%,
Final Examination	40%.

COURSE TITLE: **COMPUTER AIDED TECHNICAL DRAWING**
COURSE NUMBER: **BCTE 222**
CREDIT HOUR: **2**
PREREQUISITE: **TECHNICAL DRAWING WITH SKETCHING**

Course Description

This course is an introduction to computer aided drawing. CAD systems are used to draw basic lines and shapes and pictorial drawings. Free hand sketching is used to prepare for CAD exercises. Architectural drafting, symbols and conventions are covered. Presentation drawings: plans, sections, elevations and scale convections of drawings are all covered.

Course Objectives

After completing this course, students will be able to:

- describe the functions of dimensions on an engineering drawing.
- define the terms - leaders, dimension lines, extension lines, and notes.
- apply finish symbols and notes to a drawing.
- use conventional dimension techniques to describe size and shape accurately on an engineering drawing.
- use CAD systems and apply all the elements of engineering drawing.
- manipulate different type variables used to control the look and function of CAD dimensions.
- draw a simple structure with a CAD system.

Textbooks

1. **.** E. Finkelstein, AutoCAD 2010 and Auto CAD LT 2010, 2010, ISBN 978-0-470-43640-0.

References:

1. **Drawing for Designers,** by Alan Pipes, 2007
2. Besterfield, D. 2006. Technical Sketching with an Introduction to AutoCAD (4th ed.). 464 p.
3. Giesecke, F. E., Alva Mitchell, H. C. Spencer, et al. 2008. Technical Drawing (13th edition). Prentice Hall. ISBN-10: 0135135273. 912 pages.
4. Sam Kubba, Blueprint Reading: Construction Drawing for the Building Trade, 1st Edition, 2008, 384 pages, ISBN-10: 0071549862..
5. AutoCAD 2010 and AutoCAD LT2010 by E. Finklestein

Assessment/Evaluation

Drawing assignments	40%
Mid-term Exams/	20%
Final Exam or skills assessment	40%

COURSE TITLE: **ENGINEERING MECHANICS (STATICS)**
COURSE NUMBER: **BCTE 232 SAME AS INDT 212**
CREDIT HOUR: **3**
PREREQUISITE: **APPLIED MATHEMATICS I**

Course Description

This course covers static mechanical systems for general engineering. Topics in statics include scalar and vector quantities, vector operations, force and force systems, resolution and composition of forces, moment of a force, couples, resultants, centroids, and distributed loads. Laboratory exercises on measurement, force vectors and equilibrium are an important part of this course.

Course Objectives

Students completing this course will be able to:

- gain an understanding of the effect of forces acting on rigid bodies in equilibrium.
- apply static mechanics in design and analysis of structures.

Textbooks

1. Meriam J.L. and Kraige L.G. 2006. *Engineering Mechanics* –Statics . Wiley. ISBN-10 0471739326.

References

1. Bedford, A. M. and Wallace Fowler. 2007. Engineering Mechanics: Statics and Dynamics (5^{th} ed.). Prentice Hall, 1316 p. ISBN-10 013614257.
2. Hibbler R. C.2003. Engineering Mechanics statics and Dynamics, 10^{th} edition. Prentice Hall, ISBN-10: 0131417770.
3. Beer and Russell. 2009. Vector Mechanics for Engineers Statics, 9^{th} edition, McGraw-Hill. ISBN-10: 007727556X.

Assessment/Evaluation

Quizzes	10%
Mid-Exam	20%
Final Exam	40%
Laboratory work	30%

COURSE TITLE: **BUILDING CONSTRUCTION & WORKSHOP TRAINING-I**
COURSE NUMBER: **BCTE 311**
CREDIT HOUR: **4**
PREREQUISITE: **COMPUTER AIDED TECHNICAL DRAWING**

Course Description

This practical course on construction begins with foundations and extends upwards covering the entire structure. Topics include soil investigation, construction materials and methods, floor construction materials and methods, wall construction materials and construction details, wall finishing, types and construction details such as plastering and painting, pointing, rendering and cladding. Roof types and functions are covered including roof covering, drainage, construction materials, ceiling construction materials and details. Workshop exercises will demonstrate competency in concrete, masonry construction and construction details.

Course Objectives

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

- understand methods of soil exploration & site investigations.
- select types of foundation suitable for construction site
- use various methods of setting out foundation trenches.
- use skills in masonry construction: brick, stones & hallow blocks.
- select different types of floors & flooring materials.
- prepare a concrete foundation with a masonry wall.
- paint plastered and wooden surfaces.

Textbooks-

1. **Working with Concrete 2003** by Arnold, Rick
2. Basics Masonry Construction by Nils Kummer
3. Basics Roof Construction, by Tanja Brotruck

References

1. Miller's Guide to Foundations & Sitework 2005 Miller, Rex and Miller, Mark R.Fine Homebuilding. 2008. Foundations and Concrete Work (Pros by Pros). ISBN – 10 156158990X.
2. Creative Homeowner. 2006. Ultimate Guide to Masonry and Concrete: Design, Build, Maintain. ISBN-10 1580112986.
3. Wagner, J.D. 2005. Ultimate Guide to House Framing: Plan, Design, Build. 240 p. ISBN-10 1580112352.
4. Brotruck, Tanja. 2006. Basics Roof Consruction. 76 p. ISBN-10 376437683X.

Assessment/Evaluation

Workshop exercise	30%
Mid-term Exam	30%
Final exam	40%

COURSE TITLE: **BUILDING CONSTRUCTION & WORKSHOP TRAINING-II**
COURSE NUMBER: **BCTE 312**
CREDIT HOUR: **4**
PREREQUISITE: **BUILDING CONSTRUCTION & WORKSHOP TRAINING I**

Course Description
This course is a continuation of Building Construction and Workshop Training I. The focus is on building elements and components. Topics include stairs and their construction details, other means of vertical circulations (Elevators, escalators etc.), doors and windows, arches and lintels; balconies, loggias, canopy and terraces, flues and fireplaces. Other topics include damp proofing; sound and thermal insulation, plumbing and electrical wiring; kitchen appliances, and lavatory fixtures. External work such as paving, gardening, drainage, fences and sewerage lines/septic tank construction are also covered. Workshop exercises on basic plumbing and wiring is a part of this course. Construction site visits are required with reports focusing on detail of building elements covered in the course.

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

- design structural timber works, such as roofs, floors, scaffoldings and shoring's
- select types of joints of timber that improve stability, aesthetic appearance, and facilitate the construction.
- identify types of roofs different climatic areas.
- determine types and sizes of doors & windows.
- demonstrate competency in plumbing and wiring.
- install suitable materials for damp proofing and fire resistance construction.

Textbooks-

1. Basics Roof Construction, by Tanja Brotruck
2. Basics Masonry Construction by Nils Kummer

***References*:**

1. Fine Homebuilding. 2008. Foundations and Concrete Work (Pros by Pros). ISBN – 10 156158990X.
2. Creative Homeowner. 2006. Ultimate Guide to Masonry and Concrete: Design, Build, Maintain. ISBN-10 1580112986.
3. Wagner, J.D. 2005. Ultimate Guide to House Framing: Plan, Design, Build. 240 p. ISBN-10 1580112352.
4. Brotruck, Tanja. 2006. Basics Roof Construction. 76 p. ISBN-10 376437683X.

Assessment/Evaluation

Workshop exercise	30%
Mid-term Exam	30%
Final exam	40%

COURSE TITLE: **FUNDAMENTALS OF SURVEYING**
COURSE NUMBER: **BCTE 321**
CREDIT HOUR: **3**
PREREQUISITE: **NONE**

Course Description:

This course covers the basics of surveying and gives the students practical experience in using modern surveying equipment. Topics include types of surveying, distance measurement techniques, leveling, measurement of angles, direction of a line and azimuth and bearing of a line. Computation of areas from coordinates and calculation of volumes of earthwork: from cross sections are included. Field practice and data analysis is an important part of this course.

Course Objectives

Students will learn the theory needed for surveying and be able to do field work in construction and land surveying. They will be able to demonstrate basic familiarity and use of surveying equipment and ability to prepare field book records.

Textbooks

1. Irvine, W. and Finlay Maclennan. 2005. Surveying for Construction. ISBN 10 0077111144

References

1. Schofield, W. and M. Breach. 2007. Engineering Surveying, 6th ed. Butterworth-Heinemann.
2. Banister, A., S.Raymond, R. Baker. Surveying.

Evaluation & Grading Systems

Mid Exam	30%
Project to demonstrate competency in surveying	40%
Final Examination	30%

COURSE TITLE: **COMPUTER AIDED CONSTRUCTION DRAWING**
COURSE NUMBER: **BCTE 322**
CREDIT HOUR: **2**
PREREQUISITE: **COMPUTER AIDED TECHNICAL DRAWING**

Course Description

This course extends the students skill in CAD work to detailed construction drawings. Students will use the more advanced features of AutoCAD to make a construction drawing of a simple structure.

Course Objectives

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

- draw working drawing with CAD systems using step-by-step procedures with associated commands
- explain CAD concepts
- demonstrate skill by creating a construction drawing for a structure.

Textbooks:

1. D. J. Hepler et al., Drafting and Design for Architecture, 2006, ISBN 1-4018-7995-0

References:

1. K. A. Bisharat, Construction Graphics, 2 nd Edition, 2008, ISBN 13: 9780470137505
2. Ellen Finkelstein, 2009, AutoCAD 2010 and AutoCAD LT 2010 Bible,K. Bisharat, Construction Graphics: A Practical Guide to Interpreting Working Drawings. 2009, 2nd Edition, ISBN-10:0470137509

Assessment/Evaluation

Design project	60%
Continuous assessments	40%

COURSE TITLE: **STRENGTH OF MATERIALS**
COURSE NUMBER: **BCTE 331**
CREDIT HOUR: **3**
PREREQUISITE: **ENGINEERING MECHANICS**

Course Description

This course develops and applies analytical methods to determine the mechanical behavior of deformable bodies (stress, strain, and deflections) subjected to various types of loading. In addition, students will become familiar with properties of construction materials. Topics on stress include normal stress, shearing stress, ultimate stress, allowable stress, factor of safety, stress - strain diagrams, temperature stresses and torsion. Application is made to common construction materials and geometries using materials properties in engineering handbooks.

Course Objectives

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

- draw shears force and bending, moment and axial force diagrams.
- compute stress and strains in simple members subjected to axial loading, torsion, bending and combined loadings.
- compute buckling load of columns and determine deflection of beams.
- use engineering tables to find materials properties
- perform laboratory testing of materials
- understand the impact on quality of material choice.

Textbooks

1. Ferdinand P.Beers & E.Russell Johnston.J.R. 2008. Mechanics of Materials. 816 p. ISBN10: 0071249990

References

1. Popov E.P. Mechanics of Materials.
2. Singer F.L. Strength of Materials.
3. Strength of Materials, Schuam's Series

Assessment/Evaluation

Quizzes	10%
Mid-term Exam	30%
Laboratory reports	20%
Final exam	40%

COURSE TITLE: **HYDRAULICS**
COURSE NUMBER: **BCTE 332**
CREDIT HOUR: **3**
PREREQUISITE: **APPLIED MATHEMATICS II**

Course Description

This course covers fluid flow in open channels and closed piping systems. Topics include fluids, properties, definitions (density, compressibility, viscosity) and the fundamental laws of fluid mechanics (continuity, momentum and moment of energy equations. ideal fluid flow). The study of water flow in open channels includes energy and momentum principles, specific energy, specific force, critical flow, channel transitions, and hydraulic jump. Water flow in pipes includes Laminar and turbulent flows, pipe friction, energy losses in pipes, measurements of flow and head loss in pipe lines and pipe networks.

Course Objectives

Students will be able to

- apply the principles of fluid mechanics to flow in open channels.
- understand uniform flow, flow resistance, gradually varied flow, flow transitions, and unsteady flow.
- understand pipe friction and pressure loss in pipes and flow components;
- design piping networks to achieve desired flow and pressure loss.

Textbooks

1. Mott, RL. 2005. Applied Fluid Mechanics – With CD (6^{th} edition). Prentice Hall Inc. ISBN 10 0131146807

References

1. Mays, L. 2005. Water Resource Engineering. 860 p. ISBN-10 0471705241
2. Gribbin, JE. 2007. Introduction to Hydraulics and Hydrology. Delmar Learning.

Assessment/Evaluation

Mid-Exam	30%
Project	30%
Final Exam	40%

COURSE TITLE: **THEORY OF STRUCTURES - I**
COURSE NUMBER: **BCTE 341**
CREDIT HOUR: **3**
CO-REREQUISITE: **STRENGTH OF MATERIALS**

Course Description

This course introduces the structural analysis that is required to verify that a proposed construction design will have sufficient safety margins to ensure integrity. Topics include determinacy and indeterminacy of structures; analysis of statistically determinate structures, loads on structures, influence line for statistically determinate structures, deflections of determinate structures and approximate analysis of statistically indeterminate structures.

Course Objectives

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

- find determinacy & indeterminacy of structures.
- apply methods of joints & section to analyze statically determinate structures.
- determine the loads the structure must support using load combination.
- develop shear and bending moment diagrams of statically determinate beams & frames.
- determine elastic deflection of beams.
- sketch deflection diagrams & elastic curve of beams and frames subjected to loading.
- analyze portal frames using approximate analysis of structures.
- analyze simple indeterminate structures by superposition & compatibility methods (flexibility methods).

***Textbooks*:**

Hibbler, R.C. Structural Analysis, 7th edition. 2008. 704p. Prentice Hall. ISBN-10 0136020608.

***References*:**

1. Schode, Daniel. 2001. Structures, Fourth Edition.
2. Varziruni, V.N. 2005. Analysis of Structures, Volumes I, II.

Assessment/Evaluation

Homework	10%
Mid-term Exam	40%
Final exam	50%

COURSE TITLE: **THEORY OF STRUCTURES - II**
COURSE NUMBER: **BCTE 342**
CREDIT HOUR: **3**
PREREQUISITE: **THEORY OF STRUCTURES I**

Course Description

This course continues the study of structures by analysis of statically indeterminate structures using slope deflection and moment distribution methods, Kani's methods, and stiffness methods of structural analysis. Computerized structural analysis is introduced. Computer applications for analysis of statically indeterminate structures using SAP 2000, Matlab, and Maple are also included.

Course Objectives

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

- analyze statically indeterminate structures using displacement methods: slop deflection, moment distribution, & Kani's method.
- draw shear for & bending moment diagrams for indeterminate structures.
- develop stiffness matrix for beams, trusses, and frame members.
- apply computer programs to determine solutions of stuffiness matrices.
- apply computer programs for structural analysis.

Textbooks:

Hibbler, R.C. Structural Analysis, 7^{th} edition. 2008. 704p. Prentice Hall. ISBN-10 0136020608.

References:

1. Schode, Daniel. 2001. Structures, Fourth Edition.
2. Varziruni, V.N. 2005. Analysis of Structures, Volumes I, II.

Assessment/Evaluation

Mid-term Exam	30%
Project	30%
Final exam	40%

COURSE TITLE: **CONSTRUCTION QUALITY MANAGEMENT**
COURSE NUMBER: **BCTE 352**
CREDIT HOUR: **3**
PREREQUISITE: **NONE**

Course Description

The course covers setting quality standards, establishing a quality control plan and implementing that plan in all aspects of the construction. Quality needs to be an important part of contracting, site supervision and well as all aspects from selection of materials, design standards and codes. The course covers quality programs for all these aspects of construction.

Course Objectives

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

- set quality standards
- make a quality plan
- implement quality control in contracting and site supervision
- apply quality standards in all aspects of the construction.

Textbooks

1 B. Thorpe and P. Sumner, Quality Management in Construction, 2005, ISBN-10: 06608614X.

References

2. Olomolaiye, P. O., A. K . W. Jayawardane & F. C. Harris, Construction Productivity Management.

Assessment/Evaluation

- Written mid-term Exam 30%
- Written Final exam 40%
- Case study 30%

COURSE TITLE: **BASIC ELECTRICITY**
COURSE NUMBER: **BCTE 362**
CREDIT HOUR: **3**
PREREQUISITE: **APPLIED MATHEMATICS I**

Course Description

This course enables the student to perform basic wiring of general lighting circuits, switching, receptacles and appliances. Identification of electrical materials and proper installation practices will be carefully evaluated. Service layout and installation calculations will be incorporated with safety habits, tools and wiring materials.

Course Objectives

: Upon completion of this course students will have knowledge and experience for:

- safe electrical site working
- designing electrical wiring systems, wiring enclosures and equipment
- installing electrical wiring systems, wiring enclosures and equipment
- connecting electrical wiring systems, enclosures and equipment
- inspecting, testing and commissioning electrical installation
- diagnosing and correcting electrical faults
- providing technical and functional information

Textbooks

Mullin, RC and RL Smith. 2008. Electrical Wiring Commercial, 13th ed. Delmar Cengage Learning. ISBN-10 1418064041.

References

1. Mullin, RC. 2004. Electrical Wiring Residential: Based on the 2005 National Electric Code, 15th ed. Delmar Cengage Learning.

2. National Electric Code 2008 (National Fire Protection Association National Electrical Code). 2007. Delmar Cengage Learning.

Evaluation and Grading Systems

Mid-term Exam	30%
Final exam	40%
Case study	30%

COURSE TITLE:	**BUILDING MAINTENANCE**
COURSE NUMBER:	**BCTE 411**
CREDIT HOUR:	**3**
PREREQUISITE:	**BUILDING CONSTRUCTION AND WORKSOP TRAINING I**

Course Description

Durability of building materials and ease of maintenance are two important aspects of construction that will be covered in this course. Topics include description and characteristic of failure reasons and risks for different types of structures and diagnosing and repair methods for various structures and materials. The course includes repair and strengthening methods for concrete, timber and steel structures. Specification and measurements, tendering procedures and planning and financing maintenance work are all included.

Course Objectives

Upon successful completion of the courses students will be able to:

- understand durability of building materials
- identify Deterioration mechanisms of construction materials and prevention methods
- understand Correction mechanisms of rebar's and structural steels and prevention methods
- understand methods of repairing strengthening, plasters, structural timbers, wall claddings.

Textbooks:

Wood, Brian. 2009. Building Maintenance. 328 p. ISBN 10 1405179676

References:

1. Dansk Standard) Danish Standards Association. 2004. Repair of Concrete Structures to EN 1504.
2. Gahlot, P. S. 2008. Building Repairs, Maintenance & Management. C B S Publishers and Distributors.

Assessment/Evaluation

Mid-Exam	30%
Project	30%
Final Exam	40%

COURSE TITLE: **CONSTRUCTION CONTRACT ADMINISTRATION**
COURSE NUMBER: **BCTE 412**
CREDIT HOUR: **3**
CO-REREQUISITE: **CONSTRUCTION PROJECT MANAGEMENT**

Course Description

This course covers the contracting process in a construction project. Topics relating to the contracting stage include the purpose, types, preparation of the tender, prequalification, statistical approach in tendering to bidders, tender evaluation and post qualification tender documents. Topics relating to the contract include awarding of contract, contract agreement, conditions of a contract, technical specifications, setting quality standards, bill of quantities and drawings, bonds and guaranties, bid bond, performance bond, advance payment guaranty and retention money guaranty. Addition topics include insurance and indemnification, claim administration, types of causes, contractual provisions, time related claims, cost related claims, quality related claims, arbitration and litigation.

Course Objectives

After completing this course, students will be able to manage:

- design specification,
- contractual agreement,
- competitive tendering,
- cost control, quality, variations, final accounts, claims and even disputes

.

Textbooks

Ganaway, N. 2006. Construction Business Management: What Every Construction Contractor, Builder and Subcontractor Needs to Know. 201 p. ISBN-10 0876298250.

References:

1. Gould, F. E. and N. E. Joyce. 2002. Construction Project Management.

Assessment/Evaluation

Home work	10%
Mid-term Exam	40%
Final exam	50%

COURSE TITLE: **FUNDAMENTALS OF SOIL MECHANICS**
COURSE NUMBER: **BCTE 421**
CREDIT HOUR: **3**
PREREQUISITE: **STRENGTH OF MATERIALS**

Course Description

This course covers the mechanical properties of soils and their behavior with water. Students will study how soil and water conditions can affect the stability of structural foundations. The course starts with the origin and formation of soils and the soil categories, simple soil properties and soil classification. Behavior of water in soils includes the study of soil moisture, permeability, seepage through soils, compressibility and consolidation. Laboratory work covers moisture content, specific gravity, grain size analysis, consolidation, shear strength and compaction tests.

Course Objectives

The student shall be able to:

- describe and classify soils,
- determine the rate of flow of water through soils
- calculate stresses in soils from external loads and determine effective stresses.
- calculate flow and pore water pressure under and within earth structures
- demonstrate the ability to measure key soil parameters.
- calculate one-dimensional consolidation settlement and time rate of settlement.

Textbooks

William Powrie. 2004. Soil Mechanics: Concepts &Applications. ISBN-10 041531156X

References

1. Budhu M. 2006. Soil Mechanics and Foundations, 2nd ed. John Wiley and Sons.
2. Das, Braja. 2002. Principles of Geotechnical Engineering, 5th ed. Brooks/Cole.

Assessment/Evaluation

Assignment and Mid Exam	40% ,
Laboratory	20%,
Final Examination	40%

COURSE TITLE: **CONSTRUCTION PROJECT MANAGEMENT**
COURSE NUMBER: **BCTE 422**
CREDIT HOUR: **3**
PREREQUISITE: **NONE**

Course Description

The Construction Project Management methods covered in this course are essential to successful completion of a construction project. Effective project management begins by breaking down the project into parts, identifying the interdependencies, and scheduling completion of each part. Concepts of event, activity, project planning, determination of the critical path and comparison of actual performance with the planned schedule are covered. Topics in project analysis include requirements definition, preliminary design, detailed design and implementation. Software is studied that can be used to draw project diagrams such as Gantt Charts, PERT diagrams and manpower loading charts. Project management also requires a strong emphasis on quality and therefore quality control techniques are also included.

Course Objectives

Students will demonstrate the ability to plan and track progress using a Project Management System and be able to institute an effective quality program.

Textbooks

Gould , F. and Joyce, N. E. 2008. Construction Project Management (3rd edition). 384 p. ISBN-10 0131996236.

References

1. Roy Pilcher, Principles of Construction Management;
2. Griffith, A., and P. Watson. 2003. Construction Management Principles and Practices. Palgrave McMillan.
3. McCaffer, R., Frank Harris & Francis Edum-Fotwe. 2006**.** Modern Construction Management. Blackwell Publishing.

Assessment/Evaluation

Mid-Exam	30%
Project	30%
Final Exam	40%

COURSE TITLE: **REINFORCED CONCRETE DESIGN**
COURSE NUMBER: **BCTE 431**
CREDIT HOUR: **4**
PREREQUISITE: **THEORY OF STRUCTURES II**

Course Description

This course covers the design and analysis of reinforced concrete structures, the most common type of construction in Ethiopia. Topics include properties of concrete. design methods, safety and serviceability, applied loads, design and analysis of rectangular beams, design and analysis of one way and two way slabs and design of flat slabs and columns. A semester project is an important part of this course.

Course Objectives

Students will be able to:

- understand the fundamental principles and procedures of reinforced concrete design.
- apply the principles of reinforced concrete design to real world problems.
- apply the basic requirements of reinforced concrete design specification.
- apply the concepts of strain compatibility and equilibrium concepts to determine the strength of members.
- analyze simple and continuous beams of any cross sectional shape for shear, flexure, and deflection.
- design beam-columns of any cross sectional shape.
- design basic foundations.
- design cantilevered retaining walls.
- understand the issues related to designing slabs on grade.

Textbook

Wang, Chukia et al. 2006. Reinforced Concrete Design, 7th edition. Wiley & Sons. ISBN 0-471-26286-2

Reference

1. Miller's Guide to Foundations & Sitework 2005 Miller, Rex and Miller, Mark R.Fine Homebuilding. 2008. Foundations and Concrete Work (Pros by Pros). ISBN – 10 156158990X.
2. Ultimate Guide to Masonry and Concrete. Design, Building, and Mainteinance by Creative Homeowner Co, ,2006

Evaluation/Assessment

Mid-term Exam	30%
Project Work	30%
Final Exam	40%

COURSE TITLE: **CONSTRUCTION SITE SUPERVISION**
COURSE NUMBER: **BCTE 432**
CREDIT HOUR: **3**
PREREQUISITE: **BUILDING CONSTRUCTION AND WORKSHOP TRAINING I**

Course Description

This course provides an understanding of the responsibility, liability and limitations of the important role of site supervisor. Topics include preparation at the head office, document investigation, site organization, record keeping, inspection of materials and workmanship, site diary, construction progress reports, variation orders, preparations of payment certificates and the controls and approvals at different construction stages. Setting quality standards, quality planning and implementation of an effective quality control system are also covered. Reports from an actual construction site will be included in this course.

Course Objectives

Students will be able to:

- maintain systems for health, safety, welfare and environmental protection
- assess and recommend work methods
- plan work activities and resources to meet work requirements
- co-ordinate work control
- control work progress against agreed programs
- allocate and monitor the use of plant, equipment or machinery
- maintain supplies of materials to meet project requirements
- implement communication systems for the project
- maintain the dimensional accuracy of the work
- control work against agreed quality standards
- contribute to controlling work quantities and costs
- co-ordinate preparation for site operations
- allocate work and check people's performance

Textbooks/References:

Levy, SM. 2008. Construction Superintendent's Operations Manual. McGraw-Hill Professional Publishing. ISBN-10 0071502416

Assessment/Evaluation

Field Exercises	30%
Mid Exam	30%
Final Exam	40%

COURSE TITLE:	**COST ESTIMATION, QUANTITY SURVEYING, AND SPECIFICATION**
COURSE NUMBER:	**BCTE 441**
CREDIT HOUR:	**3**
PREREQUISITE:	**BUILDING CONSTRUCTION AND WORKSHOP TRAINING I**

Course Description

.

This course provides an introduction to cost estimating. Preliminary and detailed estimates are covered. Topics include standard methods of measurement, preparation of take off sheets and the nature and procedures of specification writing. The course also covers specifications for principal items of civil works such as excavation, masonry, concrete, metal, wood, glazing, steel, roof, damp proofing, finishing, sanitary and electrical installation and demolition and alteration. The study covers establishment of rates, direct and indirect costs, overheads and profits. Preparation of a complete specification and bill of quantities for small size project will be an important part of this course.

Course Objectives

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

- understand estimation and costing of construction.
- prepare contract documents.
- calculate the number of different categories of works that are to be employed to complete the work within the schedule time of completion.

***Textbooks*:**

Holm, L. et al. 2004. Construction Cost Estimating: Process and Practices. 368 p. ISBN10 0130496652

***References*:**

1. Buchan, Ross D., FW Eric Fleming, Fiona E K Grant. 2003. Estimating for Builders & Surveyors. Butterworth Heinemann.
2. Seeley, Ivor H. 2001. Civil Engineering Quantities. Palgrave McMillan.

.

Assessment/Evaluation

Mid-term Exam	30%
Project Work	30%
Final Exam	40%

COURSE TITLE: **DESIGN OF TIMBER & STEEL STRUCTURES**
COURSE NUMBER: **BCTE 442**
CREDIT HOUR: **3**
PREREQUISITE: **THEORY OF STRUCTURES II**

Course Description

This course provides an understanding of the design and analysis of timber and steel structures. Topics relating to steel structures include loads on structures, load combinations, code provisions, steel structures, structural steel mechanical properties, design and analysis of steel structures and protection of steel from corrosion. Topics on timber structures include types of timber, mechanical properties of common types of timber, design and analysis of timber structure and protection of timber from fire, chemicals and weathering.

Course Objectives

Students will acquire knowledge in design of steel and timber structural members and be able to:

- determine failure modes of metals and timber..
- design and analyze steel structures.
- design and analyze timber structures.

Textbooks

Underwood J. R. and Michele Chiuini. 2007. Structural Design: A Practical Guide for Architects. ISBN-10 0471789046

References

1. Chanakya, Arya. 2009. Design of Structural Elements: Concrete, Steelwork, Masonry and Timber Designs to British Standards and Eurocodes, 3rd ed. Routledge, Taylor and Francis Group. ISBN-10 0415268451.
2. Bridge Structures: Assessment, Design and Construction. 2009. Taylor and Francis.
3. Trahair, N. S.; M. A. Bradford; D. A. Nethercot; L. Gardner. 2009. The Behavior and Design of Steel Structures to EC3, 4th ed. Routledge, UK..

Evaluation/Assessment

Mid-term Exam	30%
Project Work	30%
Final Exam	40%

COURSE TITLE: **STRUCTURAL DESIGN**
COURSE NUMBER: **BCTE 451**
CREDIT HOUR: **3**
CO-REREQUISITE: **REINFORCED CONCRETE DESIGN**

Course Description

This course provides an understanding of loads on structures from wind or earthquakes. Topics include building code standards for wind and earthquake loads, lateral loads resisting systems in buildings, stable arrangements of structural systems and distribution of lateral loads. The course also covers the approximate analysis of structures using the portal, factor and cantilevers methods. Plastic analysis of reinforced concrete beams and frames using static and kinematic methods is also included. Design of special structural elements such as hunched beams, deep beams, curved beams, and corbels and water retaining structures is covered.

Course Objectives

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

- apply basic principles of plastic analysis and design of reinforced concrete structures.
- design the structures subjected to lateral forces in addition to vertical forces.
- design and analyze special beams & dome structures.
- incorporate and utilize technology in structural analysis and design

***Textbooks*:**
Underwood J. R. and Michele Chiuini. 2007. Structural Design: A Practical Guide for Architects. ISBN-10 0471789046

***References*:**

1. Ethiopian Building Code of Standards (EBCS-1).
2. Ethiopian Building Code of Standards (EBCS-8).
3. Underwood J. R. and Michele Chiuini. 2007. Structural Design: A Practical Guide for Architects. ISBN-10 0471789046
4. Taranath, Bungale S. 1997. Steel Concrete, and Composite Design of Tall Buildings. McGraw-Hill Professional Publishers.
5. Kenneth, L, Chia-Ming. 2007. Fundamentals of Structural Analysis. McGraw-Hill.

Assessment/Evaluation

Mid-term Exam	30%
Final exam:	40%
Project Work	30%

COURSE TITLE: **WATER SUPPLY AND SANITATION**
COURSE NUMBER: **BCTE 452**
CREDIT HOUR: **3**
PREREQUISITE: **HYDRAULICS**

Course Description

This course covers structures related to water and waste water management. Water supply topics include sources and uses of water, ground water flow characteristics and design of wells. The course includes the physical, chemical and biological characteristics of water, water quality, standards, demand forecast and variation and an introduction to water treatment. Topics on conveying and distribution of water include determination of pipe sizes, installation of pumps and selection and management of reservoirs. Sanitation topics include the quantity of sewage, installation of drainage systems, sewage pipes, septic tanks and an introduction to sewage treatment methods.

Course Objectives

The students will be able to plan, design and construction a water supply and sewerage system. They will also learn about purification of drinking water and treatment in sanitation systems.

Textbooks

1. Viessman W. & Mark Hammer. 2004. Water Supply & Pollution Control.(7^{th} Edition) Prentice Hall.
2. M. Hammer and M. Hammer, Water and Waste Water Technology, 2007

References:

1. Kawamura, Susumu. 2000. Integrated Design of Water Treatment Facilities, John Wiley and Sons.

Assessment/Evaluation

Mid-term Exam	30%
Project Work	30%
Final Exam	40%

COURSE TITLE: **INTERNSHIP**
COURSE NUMBER: **BCTE 462**
CREDIT HOUR: **3**
PREREQUISITE: **SUCCESSFUL COMPLETION OF YEAR THREE**

Course description and objective:

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. Three credit hours will be awarded for approved internships provided that all conditions of the learning contract are met. The internship will occur during the summer between the third and forth year. The intern will work regular work days for two and a half months.

Completion of the following assignments is the basis for earning college credit:

1. **Daily journal**: Students are required to keep a daily journal of their job experiences. If possible it is typed and double spaced and submitted electronically to the Entrepreneurship and Management Internship Coordinator each Monday covering the prior week. If the student has no computer access, a copy must be taken to the Coordinator each Monday.
2. **Special project and report:** The host employer and HUC Internship Coordinator will coordinate to select a special project relavant to the company for assignment and completion by the student intern. Concurrent with completion of the special project, the intern will prepare an executive-level business report appropriate for submission to top management. The student will present his/her project to the other internship students, the HUC Internship Coordinator and a representative of the host employer.
3. **Executive interview summary:** Students will interview one senior level manager to understand his/her career and discuss career development. Students will summarize the interview in a one (1)-page written document with the business card of the manager attached
4. **Job Performance and Satisfactory Evaluations:** The focus of the Internship course is to develop practical career-related experience. Performance evaluations are completed by the host employer during the Internship course and upon completion of the Internship course. At least two performance evaluations are documented to form the basis for grade assignment and awarding of college credit.

Grading and College Credit: The Accounting Internship Course requirements are weighted as follows for assignment of final grade and credit:

Daily journals	40%
Special project and report	40%
Executive interview summary	10%
Job performance evaluation	10%

COURSE TITLE: **ARCHITECTURAL PLANNING & DESIGN**
COURSE NUMBER: **BCTE 511**
CREDIT HOUR: **3**
PREREQUISITE: **TECHNICAL DRAWING WITH SKETCHING**

Course Description

This course introduces students to architectural planning and design. Determinates of architectural design include space, form and function, structure, materials, technology and analysis of the site. A design program including site planning and design of a small residential house will be completed with emphasis on planning requirements (building regulations, outdoor space utilization, organization). The social relationships of the users of the proposed design will be considered. A design project will an important part of this course.

Course Objectives

Students will be able to conceptualize and implement architectural ideas in response to the environment, landscape, and site. Students will understand buildings as shelters and enclosures, mediating between humans and their external world. Students will continue to develop the foundational design processes introduced in previous studies, and will be introduced to the role of rigorous precedent analysis in the generation of architectural ideas.

Textbooks

Hepler, Dana et al. 2005. Drafting and Design for Architecture. ISBN10 1401879950.

References

1. Paul Jenkins**,** Harry Smith**,** Ya Ping Wang. 2006. Planning and Housing in the Rapidly Urbanizing World**.** Routledge.
2. Tutorial Workbook for Chief Architects 9.5.
3. Nadel, B. A. 2004. Building Security: Handbook for Architectural Planning and Design. McGraw-Hill Professional.

Assessment/Evaluation

Mid term exam	30%
Project	30%
Final Exam	40%

COURSE TITLE: **BUILDING ECONOMICS AND FINANCE**
COURSE NUMBER: **BCTE 512**
CREDIT HOUR: **3**
PREREQUISITE: **CONSTRUCTION PROJECT MANAGEMENT**

Course Description

This course provides an understanding of the financial issues associated with construction. Topics include cash flows; investment appraisal methods; finance in civil engineering, inflation, depreciation, cost estimation, preparation of budgets, tender preparation and cost control; financial incentives and taxation. The sources of finance in large capital projects, the risk in project finance and regulation of financial institutions are also covered.

Course Objectives

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

- understand basic principals in engineering economics.
- understands methods of comparing alternative proposals.
- evaluate project proposals.
- understand project appraisal and case studies.

***Textbooks*:**

Blank L.T & Antony J. Tarquin. 2008. Basics of Engineering Economy (14th edition). 696 p. McGraw-Hill. ISBN 10 0136142974.

***References*:**

1. Fabryoky, W. J. 1998. Economic Decision Analysis.
2. Chauhan. Engineering Management. Joint Brothers Publishing Company.

Assessment/Evaluation

Home work	10%
Mid-term Exam	40%
Final exam	50%

COURSE TITLE: **CONSTRUCTION METHODS & EQUIPMENT**
COURSE NUMBER: **BCTE 521**
CREDIT HOUR: **3**
PREREQUISITE: **CONSTRUCTION PROJECT MANAGEMENT**

Course Description

This course gives the student an understanding of the types of construction equipment and their use in construction. Topics include compressors and pumps; equipment for earthwork such as trenching, dredging and tunneling equipment, power excavators and cranes and foundation equipment such as concrete making equipment. The course also covers selection of construction equipment; scheduling, management of construction equipment, finance maintenance and safety.

Course Objectives

The objective of the course is to enable students to select, manage and maintain construction equipment. At the end of the course students will be able to:

- identify types of construction equipment for various construction projects.
- understand methods of construction using different types of construction equipment.
- manage equipment to reduce downtime, achieve optimum equipment utilization and increase production at minimum cost.
- Minimize hazards to workers and harm to the environment.

Textbooks:

Gransberg, D., Calin Popescu and Richard Ryan. 2006. Construction Equipment Management for Engineers, Estimators, and Owners. 568 p. ISBN-10 0849340373.

References:

1. Bisharat, K.A. 2009. Construction Graphics: A Practical Guide to Interpreting Working Drawings. 480 p. ISBN-10 0470137509.

2. Sharma, S.C. 2002. Construction Equipments & its Managements, 4th Edition. Khanna Publishers, New Delhi.
3. Shapira. 2006. Construction Planning, Equipments & Methods. McGraw-Hill.

Assessment/Evaluation

Mid-term Exam	30%
Project	30%
Final exam	40%

COURSE TITLE: **CONSTRUCTION HEALTH, SAFETY AND SECURITY**
COURSE NUMBER: **BCTE 522**
CREDIT HOUR: **3**
PREREQUISITE: **CONSTRUCTION PROJECT MANAGEMENT**

Course Description

This course presents to students the important role of health and safety management in construction and introduces management methods used to help ensure protection of workers. The course covers hazards ranging from chemical exposures to construction accidents. Topics include legal and regulatory requirements, economic costs of accidents, benefits of effective health and safety programs, record keeping and planning, implementation and monitoring of health and safety programs. Construction site security is also included. This topic covers protection of workers, equipment and materials.

Course Objectives

The course targets skills that prepare students to:

- comply with regulatory standards.
- improve productivity and enhance employee participation in the safety and health process
- provide construction workers, supervisors, and other personnel responsible for construction activities with an awareness of construction safety and health concerns in the construction industry.
- understand construction safety and health principles, and information that prepares them to recognize and control a variety of hazardous conditions.
- understand the important elements of a site security program.

Textbooks

1. Hughes, P., Ferrett, Ed. 2008. Introduction to Health and Safety in Construction, 3rd ed. ISBN 10 1856175219
2. Arata, M. 2005. Construction Site Security. 438 p. ISBN-10 0071460292.

References

1. Levitt, RE, NM Samelson. 1993. Construction Safety Management. Wiley.
2. Joyston-Bechal, Simon and Grice Helen. 2004. Health and Safety Law for the Construction Industry, 2nd ed.

Assessment/Evaluation

Assignment and Mid Exam	50%
Final Examination	50%

COURSE TITLE: **FUNDAMENTALS OF FOUNDATIONS**
COURSE NUMBER: **BCTE 531**
CREDIT HOUR: **2**
PREREQUISITE: **FUNDAMENTALS OF SOIL MECHANICS**

Course Description

This course provides the students with the knowledge needed to design foundations based on site investigation and sub soil exploration. Topics include spacing and depth of bore holes, methods of exploration and sampling, in-situ testing, measurement of the ground water table, borehole logging, load bearing capacity of soils and ultimate and allowable bearing capacity of soils. The course covers selection of types of foundation and foundation depth design and analysis of shallow foundations, isolated strip and combined footings. Analysis and design of mat/raft foundations, pile foundation, retaining walls and introduction to soil reinforcement techniques are a part of this course.

Course Objectives

The student shall be able to:

- plan a geotechnical site investigation program.
- design different types of shallow foundations.
- design earth retaining walls.

Textbooks

Das B.M. 2006. Principles of Foundation Engineering. 750 p. ISBN 10 0495082465.

References

1. Coduto, Donald P. 2001 Foundation Design, Principles and Practices, 2 ed.Prentice Hall.
2. Teferra, A. 2008 Principles of Foundation Engineering, 2nd Ed. AAU Press

Assessment/Evaluation

Assignment and Mid Exam	30%
Project	30%
Final Examination	40%

COURSE TITLE: **CONSTRUCTION LAW**
COURSE NUMBER: **BCTE 532**
CREDIT HOUR: **3**
PREREQUISITE: **CONSTRUCTION CONTRACT ADMINISTRATION**

Course Description

This course covers both international and national construction laws. The focus is on contracts and contracting which includes general laws of contracts as applied to civil works construction and special conditions of contracts and its relation to laws, codes and standards, contractual obligations and liabilities. Additional topics include the causes and effects of disputes, dispute resolutions, arbitration, mediation, expert witness requirement, and principles and procedures of resolution.

Course Objectives

The objective of this course is to introduce students to the legal principles that form the foundation of construction law and to the common practical problems that arise in this field. Students will be able to:

- understand general principles of construction law, including completion, defects, retention and certification;
- know the basic provisions of construction contracts;
- facilitate claims procedures and dispute resolution, including arbitration procedures.

Textbooks

1. The Ethiopian Civil Code 1960 edition and its amendments thereof.
2. International Federation of Consulting Engineers (FIDIC). 1999. General conditions of contract for works of civil engineering construction (the red book)

References

1. Girma Gizaw. 2002. Ethiopian contract law general provisions.
2. White, NJ. 2001. Principles and Practices of Construction Law. Prentice-Hall.

Assessment/Evaluation

Assignment and Mid-Term Exam	50%
Final Examination	50%

COURSE TITLE: **BUILDING REPAIR AND RENOVATION**
COURSE NUMBER: **BCTE 541**
CREDIT HOUR: **3**
PREREQUISITE: **CONSTRUCTION PROJECT MANAGEMENT**

Course Description

In this course students are expected to work with a real building of a medium scale, housing or public facility, that needs renovation but is structurally sound. Students will form a small business to carry out the repair and renovation. All aspects of the work will be assigned to the students including design, cost estimates, project management, quality and safety management. The project should consider social and cultural norms, environmental sustainability and demonstrate the student's project management skills. To the extent that funding is available, all or part of the work will be carried out.

Course Objectives

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

- demonstrate an understanding of building repair;
- use skills to perform interior and exterior repair,
- plan and manage all aspects of the project..

Textbooks

1. Black and Decker The Complete Photo Guide to Home Repair, 2008, 560 pages, ISBN-13: 978-1589234178

References

1. Esty and Winston, Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value and Build Competitive Advantage, 09. ISBN10: 0470303742
2. Kraig Knutson , Schexnayder, Clifford J. Schexnayder, , Fiori, C M, Richard E. Mayo. 2008. Construction Management Fundamentals. McGraw-Hill Science Engineering.

Evaluation and Grading System

Field Work	20%
Project	50%
Final Exam	30%

COURSE TITLE: **SENIOR PROJECT**
COURSE NUMBER: **BCTE 542**
CREDIT HOUR: **3**
PREREQUISITE: **NONE**

Course Description

The senior project is a supervised practical project of appropriate standard in the field of specialization aimed at increasing the student's understanding and awareness of the community's technical needs. The project should use the skills and knowledge gained at HUC as well as develop the student's ability to seek and find solutions to problems through independent research and experimentation. The project can be assigned by the department or suggested by the student and submitted for approval. Projects can be assigned for individual student or in groups of two or more.

Course Objectives

After completing this course, a student should be able to:

- work as part of a team
- define and solve a professional level, unstructured, technical problems
- write a professional level technical report
- develop and deliver a professional level oral presentation

Textbooks:

No textbooks required.

Assessment/Evaluation

Project content	70%
Team participation	10%
Presentation	20%

COURSE DESCRIPTION FOR SUPPORTIVE COURSES

COURSE TITLE: **APPLIED MATHEMATICS - I**
COURSE NUMBER: **MATH 205 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **4**
PREREQUISITE: **NONE**

Course Description

This course provides the mathematics preparation needed for engineering courses. Topics include algebra, graphs; systems of linear equations; matrices, polynomial expressions; trigonometry; functions with inverses; introduction to differential and integral calculus

Course Objectives

The object is to equip students with basic mathematical techniques of algebra, graphs, vector algebra, trigonometry and basic functions to prepare students for calculus and help them develop skill build-up in mathematical analysis for solving engineering problems.

***Textbooks*:**

Stroud, K. A. 2007. Engineering Mathematics, 6th ed. ISBN: 978-0-8311-3327-6.

***References*:**

1. Nathan Niles. Calculus with Analytic Geometry, 2nd ed, Prentice Hall.
2. Mathematical Handbook of Formulas and Tables 2nd ed. by Murray R. Spiegel and John Liu, 1999
3. Applied Mathematics. For the Managerial, Life and Social Sciences by S.T. Tan, 2007
4. A Custom Edition of Calculus for Business, Economics, Life Sciences and Social Sciences by Barnett, Ziegler and Byleen, 1999
5. Differential Equations with Boundary Value Problems, S. Hollis, 2002
6. Multivariable Calculus, F. Beatrous and C. Curjel, 2002

Assessment/Evaluation

Assignments	10%;
Mid examination	40%;
Final examination	50%.

COURSE TITLE: **APPLIED MATHEMATICS – II**
COURSE NUMBER: **MATH – 206 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **4**
PREREQUISITE: **APPLIED MATHEMATICS I**

Course Description

This course is a continuation of Applied Mathematics I. It provides the advance preparation in mathematics needed for engineering. Topics include complex numbers, vectors, differential and integral calculus**,** differentiation applications, integration applications and differential equations.

Course Objectives

Students shall understand the mathematics including calculus of differential equations, needed for engineering.

Textbooks

Stroud, K. A. 2007. Engineering Mathematics, 6th ed. ISBN: 978-0-8311-3327-6.

***References*:**

1 Nathan Niles. Calculus with Analytic Geometry, 2nd ed, Prentice Hall.
2 Mathematical Handbook of Formulas and Tables 2nd ed. by Murray R. Spiegel and John Liu, 1999
3 Applied Mathematics. For the Managerial, Life and Social Sciences by S.T. Tan, 2007
4 A Custom Edition of Calculus for Business, Economics, Life Sciences and Social Sciences by Barnett, Ziegler and Byleen, 1999
5 Differential Equations with Boundary Value Problems, S. Hollis, 2002
6 Multivariable Calculus, F. Beatrous and C. Curjel, 2002

Assessment/Evaluation

- Assignment 10%
Mid Term 40
- Final Examination 50%

COURSE TITLE: **INTRODUCTION TO PROBABILITY AND STATISTICS**
COURSE NUMBER: **STAT 301 RESPONSIBILITY: CROSSCUTTINGS**
CREDIT HOUR: **3**
PREREQUISITE: **APPLIED MATHEMATICS I**

Course Description

This course is designed to provide students an introduction to the basic science of statistics. Students will develop a useable understanding of research design, the organization of data, measures of central tendency and variability, central tendency theory, descriptive and inferential statistics, parametric and nonparametric tests, and basic test assumptions. Primarily, students will be introduced to the fundamental ideas of data collection and presentation, populations and samples; the presentation and interpretation of data, descriptive statistics, linear regression, and inferential statistics including confidence intervals and hypothesis testing. Basic concepts are studied using applications from economic ideas, education, business, social science, and the natural sciences. Also included is a mathematical introduction to probability theory including the properties of probability; probability distributions; expected values and moments, specific discrete and continuous distributions; and transformations of random variables

Course Objectives

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

- acquire knowledge on statistical methods,
- collect and organize facts for statistical analysis,
- make interpretations of data collected, and
- make statistical inferences based on statistical analyses

Textbooks

Freedman, David, Purves, Pisani. 2006. Statistics. WW Norton & Co (ed). ISBN-10: 0393930432.

References

1. Berenson , Mark L; Levine, David M. and Krehbiel, Timothy C. (2008) Basic Business Statistics, 11th ed., Prentice Hall, USA
2. Brase, Charles Henry and Brase, Corrinne Pellillo (2006) Understanding Basic Statistics, 4th ed., Houghton Mifflin Company, New York 2 copies
3. Lind , Douglas A.; Marchal, William G. and Wathen, Samuel A. (2007) Basic statistics for business and economics with student CD (CD-ROM), 6th ed., McGraw-Hill/Irwin, New York

Evaluation

Class Exercises/Assignments/Quizzes	30%
Mid-term	30%
Final Exam	40%

COURSE TITLE: **INTRODUCTION TO ENTREPRENEURSHIP**
COURSE NUMBER: **MAEN 211**
CREDIT HOUR: **3**
PREQUISITE: **None**

Course description

This course is an introduction to entrepreneurship. Topics include economic, social and political climate; demographic, technological and social changes; skills, challenges, and rewards of entrepreneurship. This course will provide a basic understanding of the entrepreneurial or new venture process. Students will discuss the critical role that opportunity recognition and creation plays in that process. Several class exercises will assist students to identify their own personal goals, and their unique skills and competencies related to the entrepreneurial process. Students will also develop a simple business plan, which will enable them to examine how entrepreneurs and investors create, find, and differentiate robust, money-making opportunities from "good ideas."

Course objectives

- Upon successful completion of this course, students should be able to:
- develop a simple business plan.
- evaluate their own entrepreneurial tendencies and create a new venture.
- explain the role of entrepreneurship and new venture creation in economic development.
- evaluate and explain the real-world of entrepreneurship and the entrepreneurial mindset.
- understand the process of opportunity recognition and analysis.
- clearly articulate a new venture's business model.
- recognize the importance of teams in the entrepreneurial process and the pros and cons. associated with different behavior types when starting a new venture.
- be familiar with the financial issues associated with new venture start-ups.
- develop an understanding of entrepreneurship as a business behavior worldwide.

Textbooks

Kuratko, Donald, Entrepreneurship: Theory, Process and Practice, 2008. ISBN10: 0324590913,

References

1. Entrepreneurial Small Business, Katz, Jerry and Richard Green, 2008, 848 p.ISBN-10: 0073405063
2. How to Write a Business Plan, Ethiopian Chamber of Commerce, 2004.
3. Small Business Management: Launching and Growing Entrepreneurial Ventures,J. Longenecker et al., 2007, 768 p. ISBN-10: 0324569728
4. Hisrich, Peters, Shephard,(HPS) , 7e, 2008.McGraw-Hill

Evaluation Scheme:

Continuous Assessment	25%
Midterm exam	20%
Project work	25%
Final Exam	30%

COURSE TITLE: **PHYSICS LABORATORY**
COURSE NUMBER: **PHYS 202 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **3**
PREREQUSITE: **APPLIED MATHEMATICS I**

Course Description:
The purpose of this course is to reinforce learning of physics theory by a series of practical laboratory exercises. The topics covered include 1-d and 2-d motion, force and motion, energy and momentum, circular motion, fluids, heat and temperature, wave motion, electric charge, electric potential and current, magnetism, reflection and refraction of light and mirrors and lenses.

Course Objectives:
The objectives are to reinforce past learning by practical exercises in important areas of classical physics, to improve the students problem solving skills and to improve the students skill in working with instruments and other technical equipment.

Textbook:

J.D. Wilson, Buffa, and Lou, College Physics, 6th Edition, 2007

Reference
1. Physics for Scientists and Engineers Vol. 1, Tipler and Mosca, 5th Edition, 2004,
2. Physical Science, 6th Edition, Bill Tilery, 2005
3. Physics for Scientists and Engineers, Vol. 2, Paul Tipler, 2003

Assessment/Evaluation

Laboratory Reports	30%
Mid-Term Examination	30%
Final Examination	40%

COURSE DESCRIPTIONS FOR CROSSCUTTING COURSES

COURSE TITLE: **SOPHOMORE ENGLISH**
COURSE NUMBER: **FLEN 201 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **3**
PREREQUSITE: **NONE**

Course Description:
A course designed to develop college-level reading and writing skills. It includes critical analysis of and written response to readings, as well as academic vocabulary, grammar and mechanics. It focuses on the steps of the writing process: planning, organizing, writing, peer review, revising, and editing while writing essays in various rhetorical patterns of organization and development. There will be in-class essays and others prepared outside of class. Students will write every day in class. In addition, students will improve listening and speaking skills through listening to lectures and taking notes, class discussion, giving short talks and responding to questions.

Course objectives:
This course will enable students to**:**

- understand and critically analyze class readings, as well as their textbooks
- improve their academic vocabulary, written and spoken grammar and mechanics usage
- improve their overall writing skills: being able to write clearly and correctly, make points and support them with examples and explanations.
- write under time pressure in answering essay examination questions.
- understand oral academic lectures and basic English conversation.

Textbook:

1. Evergreen: A Guide to Writing with Readings, 8th Edition. Susan Fawcett. 2007. Houghton-Mifflin/ Cengage, ISBN10: 0618766448

References:

1. Real Writing with Readings,, Susan Anker, 2004, ISBN-10: 0312405219
2. Mastering Reading through Reasoning, by Dr.Arthur Whimbey, l985
3. 75 Readings:Anthology ;by S. Buscemi, C. Smith, 2007
4. Writing Analytically, 4e, D. Rosenwasser, J. Stephen, 2006 (100)
5. Language Arts: Process, Product and Assessment, 1999, by Pamela Farris (20)
6. Prentice Hall Writing and Grammar: Communication in Action, by Carroll,et.al,2001

Assessment/Evaluation

Tests: reading, grammar, vocabulary	20%
Writing assignments:	40%
Class participation in discussion	10%
Final exam, including writing	30%

COURSE TITLE: **PROFESSIONAL WRITING**
COURSE NUMBER: **FLEN 202 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **3**
PREREQUSITE: **FLEN 201, SOPHOMORE ENGLISH**

Course Description
A course extending use of the writing process to longer essays based on analysis of readings, through awareness of audience, purpose and diverse viewpoints. Additional writing will be based on readings and research in students' professional fields, incorporating credible evidence through quotations, paraphrase and summary, according to MLA/APA standards. Studemts will learn to distinguish between opinion, facts and inferences and to use argument and persuasion. Students will work in teams on a proficiency task, writing a marketing plan and presenting it to the class.

Course Objectives:
Students will be able to:

- write essays with a clear thesis, logical points to support the thesis, and evidence based on library and Internet research, using MLA/ APA documentation.
- avoid plagiarism by incorporating this evidence using documentation.
- improve their writing and proofreading skills through participating in peer review.
- write clear and concise reports and papers appropriate to their field of study, using library and Internet research. Business students will write business letters, memos, resumes, reports, and a business plan.
- use technical writing styles and formats: reports, proposals, analysis of technical articles, and learn the appropriate vocabulary used in their field.
- use improved speaking and presentation skills through class and small group discussions, and an oral presentation based on the final writing.
- develop and write a marketing plan.

Textbooks:

1. Susan Fawcett , Evergreen: A Guide to Writing w.Readings, 8th Ed. 2007. Houghton-Mifflin (now Cengage)
2. Alred, Gerald J, Brusaw, Charles, and Oliu, Walter; Business Writers' Handbook.,. 2008. Bedford-St. Martins. 590 p..ISBN10: 0132477090

References

1. Alred,Gerald J, Brusaw, Charles, Oliu,Walter; Handbook of Technical Writing, 2008, 9th ed. MacMillan. ISBN: 9780312057336
2. Michael Merkel, Technical Communication,9e. ISBN9780-312485979 Bedford St.M.
3. Writing in the Disciplines:Supplement,TomJehn,Jane,2007, ISBN10: 0312452640
4. Discovering Arguments, an Introduction to Critical Thinking and Writing, with Readings2e, by D. Memering, W Palmer, 2006 (80)
5. Creative Editing, 3e, by D.B owles, D. Borden,2000 (1)
6. Reporting for the Media, 8e, by Fedler et al, 2005

Evaluation Scheme

Essays:	30%
Business/Technical writing assignments, including Project	50%
Final Assignment- Writing 10% Oral Presentation10%	20%

COURSE TITLE: COMMUNICATION AND PRESENTATION SKILLS

COURSE NUMBER: FLEN 301 RESPONSIBILITY: CROSSCUTTING
CREDIT HOURS: 3
PREREQUSITE: PROFESSIONAL WRITING

Course Description:

This course is designed to improve students' speaking and listening skills, understanding of turntaking, and other conventions and strategies in English conversation through discussion and role play. They will give short talks, planned and impromptu, and receive feedback. Through group assignments and presentations, students will improve their ability to discuss controversial or difficult topics in a respectful manner and tone: listening for understanding, then presenting their views - in conversation, to solve a business problem, or to persuade. As a final project, students will research an area of interest in their field and write a paper on it, using properly documented sources, and then make a final oral presentation to the class using AV equipment. Questions and answers will follow each presentation.

Course Objectives:

Students successfully completing the course will have:

- developed a concern for audience and understand the importance of psychological approaches to the solution of business problems through skilled communication;
- the ability to use a variety of communication strategies, and know when to use them;
- developed presentation skills, oral and written, with or without AV equipment.
- developed an ability to apply critical thinking and decision-making skills to business
- developed an ability to work effectively with other people in small groups or teams
- learned to listen for understanding
- the ability to understand and negotiate differences in communication between oneself and people from other cultures and those with viewpoints disagreeing with one's own
- the ability to give and receive feedback that will improve communication

Textbook:

1. Guide to Managerial Communication. 7thEd Munter, Mary Munter. Upper Saddle River, NJ,Prentice Hall 2007 ISBN: 0131755234.
2. Public Speaking: A Audience Centered Approach, Beebe and Beebe, 2006

References:

1. Locker, Kitty O and Kaczmarek, Stephen Kyo, Building Critical Skills, 4th Ed. *McGraw-Hill/Irwin, NY 2008, ISBN10: 007-3377724*
2. Alred, Gerald J, Brusaw, Charles, and Oliu, Walter. Business Writers' Handbook., 2008, . Bedford-St. Martins. 590 p.. ISBN10: 0132477090
3. The Art of Public Speaking, and Learning Tools Suite, 8e,by Stephen Lucas, 2004 + CDRom, Topics
4. Literature, the Human Experience,9e byM. Klotz, R.Abcarian, 2007

Assessment/Evaluation

Classwork: discussions, role plays, short talks	20%
Assigned group and individual presentations	20%
Project work: business plan	30%
Quizzes:	20%
Final Exam	10%

COURSE TITLE: **INTRODUCTION TO COMPUTER APPLICATIONS**
COURSE NUMBER: **COMP 201 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **3**
PREREQUISITE: **NONE**

Course Description

This course is a broad introduction to the use of computers as tools for creativity, communications and organizing information. In addition to learning the technical fundamentals of computer use, students build skills in researching information, making appropriate ethical choices about the use of computers, and using technology to learn on their own and pass your new skills on to others.

The role of the computer as a communications tool will be central to this course. All students will be given computer accounts to maintain files. We will also emphasize the use of the Internet as a tool for finding information and the use of word processing, presentation software and image editing to organize and communicate ideas.

Topics will include computer hardware components, how the personal computer works and computer applications including word processing, spreadsheets, presentations, database and internet. Students are expected to learn to type and to practice exercises using MS Office.

Course Objectives

The students will be able to:

- familiarize themselves with components of computers and windows personal computers and operating systems
- use Microsoft Office as tools for writing, analyzing and presenting information
- use of information technology to assist you in other coursework
- use the internet for communications, research
- create, edit and share pictures
- creating online and paper publications and graphics using computers
- understand ethical and responsible use of computer technology

Textbooks

1. Shelly, Cashman. et al., Microsoft Office 2007: Introductory Concepts and Techniques, Windows XP Edition. 1224 p. ISBN-10 1423927133.

.***References***

1 Andy Chanelle, Beginning Open Office 3- from Novice to Professional, 2008, ISBN10: 1430215909
2 Preston, John et al. 2008. Computer Literacy for IC3 – 2007
3 Update. 400 p. ISBN-10 0135038529.
4 Using Excel & Access for Accounting 2007 by Glenn Owen, 2007
5 Advanced Excel for scientific data analysis by Robert de Levie, 2004
6 Microsoft Office Word 2003. A Professional Approach by Deborah Hinkle, 2005
7 Beginning Open Office 3 from Novice to Professional by Andy Chanelle, 2009

Assessment/Evaluation

Assignments	50%,
Mid exam	20%,
Final exam	30%

COURSE TITLE: **INTRODUCTION TO ECONOMICS**
COURSE NUMBER: **ECON – 204 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **3**
PREREQUISITE: **NONE**

Course Description
This course introduces and explores a variety of macroscopic and microeconomic topics, including: supply and demand, market equilibrium, elasticity, decision making by producers and consumers, production cost, market structures, public policy, the labour market, distribution of income, environmental policy, market efficiency and government intervention, aggregate supply and demand, market equilibrium, Gross Domestic Product, employment, income, prices, major schools of economic thought, fluctuations, growth, monetary policy, fiscal policy, the national debt, international trade, and international finance.

Course Objectives
Students should be able to:

- state the laws of supply and demand and explain the concept of equilibrium.
- identify and explain the basic principles of economics.
- enumerate and explain the three economic choices.
- provide a definition of gross domestic product and describe the four components.
- define fiscal policy and explain how it can be used to cope with fundamental economic problems.
- explain how monetary policy can be used to cope with fundamental economic problems.

Textbooks

1. Macroeconomics by Blanchard, 2006
2. Microeconomics by Pindyck and Rubinfeld, 6th ed. 2004

References

1. Mankiw, H. G. 2008. Essentials of Economics, 5th ed. 584 p. ISBN-10 0324590024.
2. O' Sullivan, A., F. Sheffrin and S. Perez. 2009. Survey of Economics: Principles, Applications and Tools, 4th ed. 456 p. ISBN-10 0136093809.
3. Rohlf, William D. 2007. Introduction to Economic Reasoning (7th Edition). (Addison-Wesley Series in Economics).
4. Economic Concepts. A Programmed Approach by Bingham and Henry Pope, 1993
5. Kohler's Microeconomics by Heinz Kohler, 1992
6. Macroeconomic Analysis by Edward Shapiro, 1999

Assessment/Evaluation

Assignments/Quizzes	30%;
Mid examination	30%;
Final examination	40%.

COURSE TITLE: **GENERAL PSYCHOLOGY**
COURSE NUMBER: **PSYC 201 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **3**
PREREQUISITE: **SOPHOMORE ENGLISH**

Course Description
The introductory 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, personality, abnormal and social psychology. Emphasis will be placed on applying psychological principles and data to life experience. The course is also geared towards helping students conceptualize the psychological foundations of human behavior in all occupations. It is also the application of the principles and concepts in overcoming various kinds of human and environmental barriers for effective relationship. Topics to be covered include motivation, emotion, knowledge retention, group dynamics and worker efficiency, sensation and perception, personality, and development of attitudes. Students will work on a proficiency task, developing a personal statement of goals and values.

Course Objectives
Upon satisfactory conclusion of the course, students will be able to:

- understand human behavior and relationship in different professions and life at large,
- be apply knowledge gained in the areas of business, government and education,
- familiarize themselves with group and individual decision-making,
- exercise effective human and environmental relationships.
- use their knowledge of psychology in developing a personal statement of goals and values

Textbooks:

Kalat, James. 2008. Introduction to Psychology, 8th ed. Wadsworth Pub. 04955102881.

References:

1. Weiten, Wayne and Diane Helpern. 2007. Psychology: Themes and Variations: with Concept Charts. Briefer Edition, 7th ed. Thomson-Wadsworth pub. 631 p. ISBN 10: 0495100587.
2. Psychological Research, Methods for Discovery and Validation, byA.C.Vadum, N.O.Rankin,1998 (1)
3. Psychology: Careers for the 21st Century, by the American Psychological Association, 2000
4. (9) Innovative Approaches to Health Psychology:
5. Prevention and Treatment: Lessons from AIDS. by M.A.Chesney, M.H. Antoni, 2002
6. Psychology, 7e, by John Santrock, 2005 (1)

Assessment/Evaluation

Assignments	20 %,
Project, practical work	30%
Mid-semester	20%
Final examination	30 %

COURSE TITLE: **CIVIC AND ETHICAL EDUCATION**
COURSE NUMBER: **CEED 201 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **3**
PREREQUISITE: **NONE**

Course Description

This fundamental objective of Civic and Ethical Education is producing good citizens with high civic qualities. Good citizens who are well aware of their rights and responsibilities as well as endowed with civic virtues such as active participation, tolerance, and civic mindedness can contribute a lot to the process of democratization and development of their own state. In view of this, this course is designed to familiarize students with basic themes and concepts of civic and ethical education, constitutionalism, democracy, human rights.. The very nature of civic education requires active participation of students in various ways, such as forwarding original arguments, participating in class discussions, debates and presentations, and we expect students to participate actively.. Professional ethics relates to fulfilling work responsibilities, honesty in financial matters and contributing to improvements in the workplace and profession. Ethical behavior also relates to society and includes tolerance, obeying the rule of law, respecting the rights of others, respecting the environment and practicing a sustainable lifestyle.

Course Objectives

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

- impart civic knowledge on various issues such as on meaning and definition of civics and ethics, constitutionalism, democracy, and human rights.
- help students clearly understand their rights and responsibilities and then exercise their rights and discharge their responsibilities.
- develop civic attitude such as patriotism, civic mindedness, and tolerance.
- develop civic skills such as accurate decision making, expression of oneself clearly and logically and conflict resolution.
- understand the importance of professional ethics and to commit to ethical behavior in all aspects of a professional career.
- understand how to live in a diverse society by demonstrating tolerance and an appreciation of other cultures.
- learn to respect the environment and live in a sustainable manner.

Textbook:

Civic and Ethical Education, Alamirew G/Mariam, 2005.

References

1. Chekki Don. 1999. “Participatory Democracy in Action" International Profiles of Community Devt. New Delhi.
2. The Constitution of the Federal Democratic Republic of Ethiopia, August 21, 1995.
3. Universal Declaration of Human Rights: Adopted by the UN General Assembly in 1948.

Assessment/Evaluation

Community project 30 %,
Mid-semester 30%
Final examination 40 %

COURSE NAME: **LEADERSHIP SKILLS**
COURSE NUMBER: **LEAD 501 RESPONSIBILITY: CROSSCUTTING**
CREDIT HOUR: **3**
PREQUISITE: **NONE**

Course description*:*

The purpose of this course is to encourage you to carefully analyze responsibilities and commitments in the context of leadership for the common good and for purposeful change. Students will come to understand the concepts of relational and servant-leadership and how they differ from traditional leadership theories. The course includes the study of leadership as well as the application of leadership theories, concepts, and skills. Students will also develop their leadership potential through the completion of personal and leadership self-assessments, values exploration, and leadership skill practice through course activities.

This course addresses the responsibility of a leader for business, society and himself. What will be the legacy of the professional leader? What difference does he make in all the networks in which he is participating? What is his basic attitude toward all the stakeholders? These kinds of questions are the core theme of this course. Leadership will be combined with stakeholder management and current thinking about the role of communities in the business world.

Course Objectives

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

- Explain their personal opinion about stewardship'
- Reflect on his/her personal effectiveness as a leader;
- Perform as a transparent leader in his/her own networks

Textbook:

1. Peter Northouse, Leadership: Theory and Practice, 5th Edition, 2009, ISBN-10 1412974887

Reference:

1 Kouzes and Posner, The Leadership Challenge, 4th Edition, 2003, ISBN-10: 0787984922
2 The Leadership Challenge by Kouzes and Posner, 2003
3 Motivating Yourself for Achievement, by A.R. Bell, D.A. Smith, 2003 (10)
4 Focus on Success, by Dr. Rita Davis, Dr. Aaron Thompson, 2001 (1)
5 Leadership, by Dr. J.Clifton Williams, l986 (1)

Assessment/Evaluation

Leadership activities	20%
Leadership Self- Assessment	20%
Mid-Term Examination	30%
Final Examination	30%