STUDY PROGRAM FOR THE DEGREE OF BACHELOR OF SCIENCE (B.SC.) IN ARCHITECTURE

Hope College of Business Science and Technology
Faculty of Science and Technology
Department of Architecture
Addis Ababa, Ethiopia

Revised Curriculum
Version II

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Hope College of Business, Science and Technology
Faculty of Science and Technology
Department of Architecture
Addis Ababa, Ethiopia

Study Program for the Degree of Bachelor of Science (B.Sc.) in Architecture
The study program was developed by the Curriculum Development Committee of the Department of Architecture and Endorsed by the Senate of the College. .

February 2015

Introductory information

Study programme
Bachelor of Science in Architecture
Estimated starting date
Academic year 2015/16
Location

HCBS, Addis Ababa
P.O.Box 12382
Addis Ababa, Ethiopia
Tel. 0118959238

Duration of study course
10 semesters for B.Sc. degree + 1 semester internship
Enrolment per year
Existing ……
Planned ……in three years' time

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LIST OF ACRONYM

ECTS	European Credit Transfer System
HCBST	Hope College of Business, Science and Technology
CP	Credit points
MOE	Ministry of Education
TVET	Technical and Vocational Education Training
COC	Certificate of Competence

1. INTRODUCTION

Ethiopia has a long history of architectural traditions. There is recorded history of pre-Axumite architectural achievements in Ethiopia. On the other hand, there is a variety of indigenous construction traditions that have evolved with climatic and economic conditions. We are people with an enviable architectural heritage. For the continued and revived state of the architectural traditions of our nation, we need architectural education centres that can maintain and enrich this age old tradition.

Architecture is a reflection of advanced societies. Advancement especially in the areas of knowledge, technology, economy and culture will increase the demand for more conducive environments. Ethiopia is in one of these moments when this is happening. People are more aware than ever of the role of their physical environments.

Architecture is also about the effective utilization of resources, be it in the form of space or construction costs.

Cities are also showing fast growth in Ethiopia. Careful interventions in the organization of our cities will mean coming generations will have an easier life in our cities.

2. BACKGROUND AND JUSTIFICATION

Ethiopia is seeing an unprecedented construction boom ushered in by a more vibrant economic activity. This has meant more skilled professionals are needed to tap and control this potent construction industry.

The construction sector is the biggest employer of the newly graduated work force. This state of affairs is set to continue. There is a need for training young people in architecture and urban design and planning as the labour market has places for new graduates from these fields of study.

3. DEPARTMENTAL VISION, MISSION AND OBJECTIVES

3.1. Vision Statement

The vision of the Department of Architecture of Hope College is to be a lead institution in offering state-of-the-art knowledge that integrates architecture with social responsibility and thus prepares highly skilled and qualified graduates who can accomplish various tasks in the field.

3.2. Mission Statement

The mission of the Department is the integration of the architectural profession with its various influencing factors be the technical, scientific, economic, social, urban, philosophical, or other relevant issues.

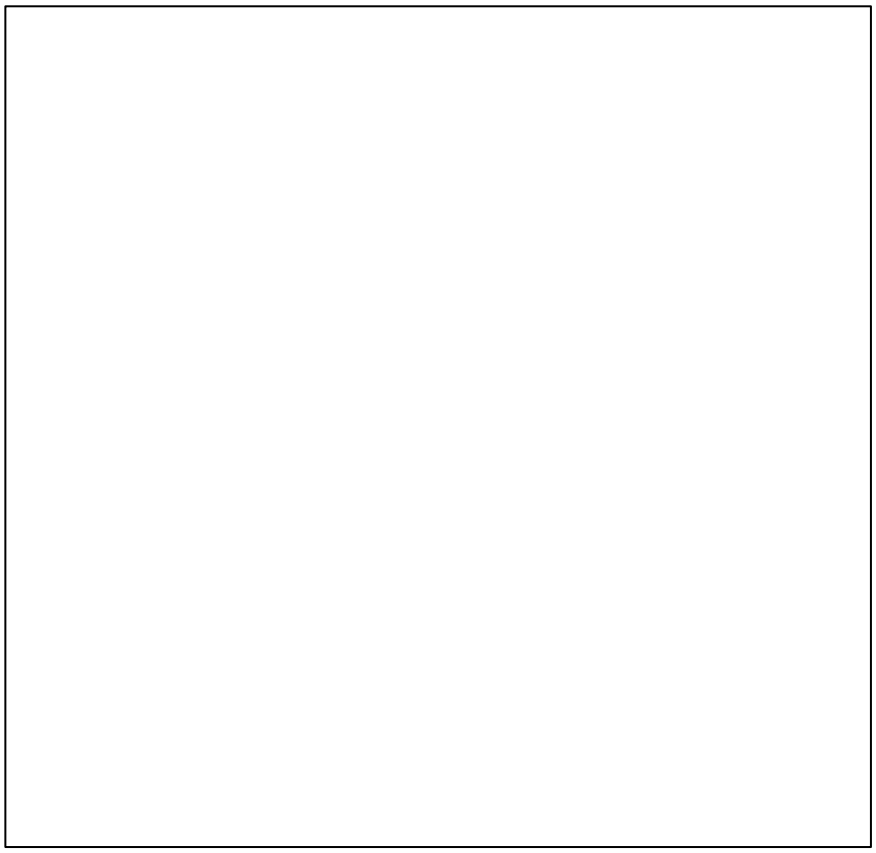
3.3. Objectives

The general objective of the architecture program is to equip graduates with the theories and practices of the architectural profession at the national, regional and international levels. The program will enable students to design buildings of various uses and complexities. Students majoring in this field of study will understand the place of architecture within the urban context. Students are required to grasp major aspects of urban design and planning.

3.3.1. The specific objectives

- Develop and assume sense of responsibility and leadership.
- In addition to theoretical issues, give due consideration to practical design matters such as: economy, function, climate and local conditions through an intimate involvement in field practice.
- Give due consideration to building codes and regulations, recent trends in building technologies, and new construction methods.
- Easily communicate with other professionals and clients through written documents and reports both in English and Amharic.
- Test and experiment with the Ethiopian architectural traditions, and research on this area with the intention of developing regionally or contextually responsive architecture.
- Participate in the study and preservation of the architectural heritage of Ethiopia

Figure 1: Architects professional contexts and Objectives summary



Regarding the social, cultural, political contexts, Architecture should be considered as a service, accessible to the whole community. It could act as a mediator of social tensions and should be considered as a resource, one of the instruments which contribute to the balance of society. They should work for the benefit of society as a whole, and try to carry out strategies that contribute to the overall quality of human settlements. Architects have some significant responsibility for the health, safety, welfare and cultural interests of the public and for the sustainability of the built environment. This responsibility should be clearly stated in legislation, defining the architect's professional responsibility, and should be acknowledged in public education efforts, by using the media, national press, radio and television to achieve a more serious understanding by the public. Conversely, it is important that society is made aware of the various areas of knowledge, skills and competence that the architectural profession could deliver, and for which, architectural education is expected to prepare them.

On the other hands, the principles and standards that able them to fulfil their fundamental professional requirements, that is the design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations, an adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning, to acquire competencies for architectural education must be established. While by the end of the Professional Architectural Education, students should have a mature understanding of the controlling influence of environmental, structural and technological issues on design and building form, as well as an appreciation of cultural and social issues, visual art disciplines and their influence on design. They should be aware of various institutional and legal as well as constructional processes involved in the design of complex buildings. Although, like other branches of professional education, it is primarily assigned the task of educating future architects, architectural education is, generally, part of the college system and must adjust to and benefit from the traditions of the college, such as doing research and seeing the professional practice within the context of society and science. In the increasingly globalizing world, architects should also be trained to not only understand, protect and highlight architectural heritage in their countries, but also to understand the contexts to go beyond traditional definitions both territorial and cultural to comprehend international contexts of architectural practices and education.

4. DURATION OF THE STUDY

The duration of study for the Degree of Bachelor of Science in Architecture is five years.

5. DEGREE NOMENCLATURE

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

- In English: "**Degree of Bachelor of Science in Architecture**"
- In Amharic: " □□□□□ □□□□ □□□ □□□□□□□□"

6. SOME RATIONALES FOR THE REVISION

6.1. Output-orientation of the course programme

The most fundamental change in the structure of the curriculum is the orientation towards the expected qualification of the students at the end of their study time. The school defines the profile of the graduates and delivers the curriculum in the feedback of the expected capabilities. The some rationales for the changes are:

- Inconsistent course arrangement and sequence
- Unclear and ambiguous course description which resulted in repetition & overlapping of course contents in some cases
- Inadequate credit hour or contact hour for some important courses and excess credit hours for the less important ones
- Importance to add some necessary courses contents (to go in line with the current stage of technology)
- The need to acquaint students with the best Architecture and the modern technology era and hence to accommodate some important projects as well as the modification and changing of the descriptions of some courses in order to widen practical sessions through more studio and projects farther emphasize on varieties of projects in a single courses.
- To provide guidelines for the course contents so as to avoid confusion on the course contents among individuals or groups of courses instructors.

6.2. To harmonize curriculum based on the criteria of Ministry of Education

One of the first things to consider is the requirement of the Ministry of Education (MOE) that all higher education institutions in the country should have a uniform level of content for each degree. This means any new program in architecture will have to be of five year duration. In addition to this in terms of course organization, all government institutions have adopted the module system. It is thus practical and advantageous that necessitates the Hope College to revise the curriculum to follow the same pattern with other equivalent institutes with regards to the courses and contents.

Furthermore, the International compatibility of Architectural education holds a special position within in the landscape in so far as it qualifies students for a profession protected by the architectural legislation and is committed to international standards laid down such: the UNESCO (the United Nations Educational, Scientific and Cultural Organisation, is a specialised agency of the United Nations system) / UIA (the International Union of Architects) charter for Architectural Education and the UIA Accord on Recommended International Standards of Professionalism in Architectural Practice. Among other criteria the UIA demands a 10 semester academic study outside of the practical internship- the proposed internship has to be added outside of this time schedule. The reform curriculum is based on the criteria of these documents.

7. ADMISSION REQUIREMENTS OF THE DEPARTMENT

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

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

8. ASSESSMENT METHODS

8.1. Student Assessment

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

8.2. The Grading System

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

Score	**[86-100)**	**[80-86)**	**[76-80)**	**[70-76)**	**[66-70)**	**[60-66)**	**[50-60)**	**[47-50)**	**(37-47)**	**Below 37**
Grade	A	A-	B+	B	B-	C+	C	C-	D	F
Value	4.00	3.75	3.50	3.00	2.75	2.50	2.00	1.75	1.00	0.00

8.3. Program Assessment

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

- Provides on-the-job training upgrading the academic qualification of the staff as needed.
- Gathers feedback from students, employers and graduates as deemed necessary and uses the feedback to improve the curriculum.
- Has prepared and put in place rules governing delivery and assessment of courses.
- Performs regular evaluation of the program based on the current trends in the field and the country's skilled manpower needs
- Periodically acquires appropriate textbooks/references, laboratory equipment, software applications and so forth.
- Prepares a course syllabus for all courses offered in the department in order to standardize the course content.
- Carries out regular evaluation of the staff

9. GRADUATION REQUIREMENTS

9.1. Minimum grade requirments

Graduating students shall be awarded the "Bachelor of Science Degree in Architecture" if they fulfil the following requirements:

- An attainment of a minimum of **179 credit hours**
- An attainment of a minimum **Cumulative Grade Point Average of 2.00**
- An attainment of a minimum **Cumulative Grade Point Average of 2.50 in major courses**
- An absence of "**F, NG, and I**" in any course grading, and
- An absence of "**D**" in architectural design courses.

9.2. Internship

The student shall work in an architect's office to gain experience, improve skills, and engage him/herself in a comprehensive architectural practice. Internship in a large or small firm, public, private and non-profit agencies associated with the architectural practice shall be completed in the 4th year summer for 2 months whichever is longer, to finish the internship.

10. DURATION OF THE STUDY

The duration of the study for the Bachelor of Science in Architecture is five years for the regular program and six and half years for extension.

11. COURSE CODING

All the architecture courses start with the prefix ARCH representing Architecture followed by three digits.

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

  0: Crosscutting courses

  1: Professional studies

  2: Theory and history

  3: Communication skills

  4: Design

  5: Building construction techniques

  6: Sustainable housing strategies

  7: Building science

  8: Integrated projects

  9: Elective courses

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

- Odd last digit shows that the course is offered in the first semester
- Even last digit shows that the course is offered in the second semester.

Remark:

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

The system is adopted from the European system of credit transfer (ECTS) between different universities. The system gives consideration for the efforts of the student outside the class room, but also enables institutions of higher education to give value to work being carried out by the student outside of the class room.

12. QUALITY ASSURANCE

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

- The internal scheme of performance audit shall enable constant renewal and relevance in the college. The audit would review the actual outcomes of the content and pedagogy of disciplines by departments, courses, programs and also student competencies.

- Though the established goals, objectives and desired outcomes of the college would be important benchmarks of the audit, the evaluation efforts, being focused on value adding features, may point to the revisiting of certain objectives and activities of the curriculum.

- In this way, the college will be made aware of what it needs to change and make the necessary adjustments to stay abreast of the latest developments of knowledge. In the end, the curriculum is intended to develop graduates who demonstrate proficiency in general knowledge, communication, critical thinking, contextual competence, aesthetic sensibility, professional identity and ethics, leadership capacity, scholarly concern for improvement and motivation for continuing learning.

- The curriculum anticipates a qualitative change in the mental and spiritual capacities of students. In this regard, every attempt will be made to transform the capacities of students to a level that would make them change makers. The evaluation will track these outcomes and assess the qualitative changes gained in each student.

- Considering the danger of internal evaluation from the standpoint of inbreeding and defensive pretensions by all concerned, internal evaluations will be counterbalanced by external ones. These would be openly discussed for subsequent adjustments.

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

- Comprehensive examinations in each class and colleague assessment of examination papers and teaching methods;

- Periodic workshops (with stakeholders, teachers and graduates);

- Assessments by using survey project works (research), internships, and link programs;

- Graduates' evaluation of the program, establishing a graduate alumni organization as a mechanism to implement such evaluations and follow their career paths;

- Standardization of course offerings through preparation of general course outlines, exam contents, and external audit;

- Annual assessment of the program by the teaching staff;

- Working closely with the relevant professional associations to assess graduates' performance.

13. GRADUATE PROFILE

The department produces graduates with superior technical skills. Graduates of the department will be able to build small projects on their own using the skills they learned at the department. The confidence to handle established material will be a spring board to encourage research and experimentation into new material and construction methods. This will allow them to hold key positions within any construction endeavour be it within cities or rural areas. They will be able to implement innovative ideas into practical projects.

The department will graduate professionals with high professional and ethical standards. Graduates will leave the school with leadership qualities that can enable them to guide the architecture and city building processes of their country.

Graduates have a deep understanding of the place and value of their heritage. They have a good grasp of local conditions. They have good understanding of the roots of architectural and urban problems. Graduates are aware of global trends in urban and architectural issues. Graduates will be equipped with the preparedness to update their knowledge continuously. All HOPE COLLEGE (HCBST) graduates shall exhibit the following profiles:

13.1. General Profile

- Integrity and Personal Accountability: appreciating and internalizing high integrity and taking responsibility for one's actions at work and in society.
- Self-regulation: instilling attitudes for self-development through lifetime learning, initiative taking and self-correction.
- Intellectuality: working scientifically, using analytical skills, to develop and carry out research that is valuable to the country's needs and development, writing and presenting one's findings in clear and coherent manner and by so doing contributing to knowledge.
- Competence: capacity to apply the knowledge transmitted and adds value in one's role in organizations.
- Leadership: playing a leading role in organizations and making a difference with team work, respect of people, exceptional integrity, motivation and commitment

13.2. Professional Profile

13.2.1. General knowledge

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

- Good knowledge and skill in architectural design, they should also have good knowledge of building construction, technical systems and requirements as well as consideration of health, safety and ecological balance,
- An understanding of the cultural, intellectual, historical, social, economic and environmental context for architecture and
- An awareness of the architect's role and responsibilities in society, which depend on a cultivated, analytical and creative mind.

13.2.2. Specific knowledge

The graduates shall have the following competencies Environmental factors:

- Ability to create architectural designs that satisfy aesthetic, functional, technical and economic requirements
- Adequate knowledge of the history, theories of architecture, fine arts, construction technologies and human sciences
- Knowledge of the fine arts as an influence on the quality of architectural design
- Adequate knowledge of urban design, planning, and the skills involved in the planning process
- Understanding of the relationship between people and buildings as well as buildings and their environments
- Develop Understanding and skills of the need to relate buildings and the spaces between them to human needs and scale
- Develop skills and adequate knowledge of the means of achieving environmentally sustainable design
- Understanding and application of methods of investigation to prepare a design project
- Understanding of the profession of architecture and the role of the architect particularly regarding social factors
- Sound understanding and application of the structural design, construction and engineering problems associated with the building design
- Adequate knowledge of physical problems and technologies and the function of the buildings so as to provide them with internal conditions of comfort and protection against climate
- Apply Necessary skills to meet building users' requirements within the constraints imposed by cost factors and building regulations
- Apply Adequate knowledge and skill of the industries, organizations, regulations and procedures involved in translating building design concepts into buildings
- Use adequate knowledge of project financing, project management and cost control.
- Be competent in the construction industry as per the professional practice

13.2.3. Transferable Skills

Graduates will be equipped with transferable skills to:

- Work in teams in architecture and urban projects;
- Have good communication with people in the construction sector
- Have self-management skills.

13.2.4. Attitudinal and Values Competency

The graduates will:

- Appreciate professionalism in their area of work.
- Have passion about their professional engagement.
- Have a positive and responsive attitude towards the value of architecture and cities in their societies
- Have personal confidence in doing their jobs.
- Be self-critical and endeavour constantly to reform themselves so as to have a difference in their professional roles.
- Work with others exhibiting high respect, cooperative spirit and a serving attitude.
- Take initiative and prepare themselves for both employment and self-employment.

14. TEACHING PHILOSOPHY AND METHODOLOGY

14.1. Teaching Philosophy

Based on the mission of HUC and the outcomes of the discussions with relevant stakeholders, the following elements constitute the philosophy of the curriculum:

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

14.2. Teaching Methodology

Competency based education which is a student-centered methodology emphasizing theory, skills, work scene interface and personal development will be exercised. In this interaction, there shall be studio classes, class room lectures, laboratory activities and application exercises in the private sector. Students will also engage in presentations and group projects which will reflect actual situations in business or industry.

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

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

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

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

15. REGULATIONS OF THE MINISTRY OF EDUCATION

One of the first things to consider is the requirement of the MOE that all higher education institutions in the country should have a uniform level of content for each degree. This means any new program in architecture will have to be of five year duration.

In terms of course organization, all government institutions have adopted the module system. It is thus practical and advantageous for Hope College to follow the same pattern.

16. RESOURCE REQUIREMENTS

16.1. Teaching Staff

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

Table 1: Required Staff profile

Year	Staff Required	Remark
1	1 MSc 1 MSc 1 MSc	Degree in architecture and experience as an architecture Experienced in basic architecture design Experienced in architectural sketching and technical drawing
2	1 MSc 1 Technician	Able to communicate structural design Skilled in wood, metal and masonry and also wiring and plumbing
3	1 MSc	Experience with building materials, environmental issues and low cost construction
4	1 MSc	Skilled and experienced in urban design and planning
5	1 PhD	Leadership skills and ability to guide senior students in project work that contributes to Ethiopian development

16.2. Laboratory and studios

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

16.3. Library Facilities

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

16.4. Tutorial Service for a Course Taught

- The faculty member of a course is the TUTOR of his/her students.
- To enable the tutoring, the faculty member shall designate office hours and inform his students of the same. The faculty member is expected to be in his office during the hours designated.
- Guidance and Counselling
- The office of student life shall provide guidance in a number of areas that contribute to the character development of students focusing on themes such as interpersonal relations, personal acceptance and care, life goals, survival skills, work ethics, relations with the opposite gender, community responsibility, right assertiveness, handling grievance and personal crisis, tolerance, reconciliation, time management, self-assessment, etc. in an open-ended and non-judgmental manner.
- The office of student life shall avail counselling service to those students that exhibit emotional burden, are at a loss, have a hard time focusing on their studies and responsibilities and show difficulty in relating to others. If the mental state of a student requires professional help, the student shall be told to seek professional help at his expense. Severe cases shall be allowed to take a semester or a year off.
- As counselling revolves around trust, a female counsellor shall be available for women and a male counsellor for men. Furthermore peer counselling as well as peer discussion will be held to facilitate the growth and discovery processes in a non-judgmental way.
- All counselling communications will be confidential.
- The college shall do its best to reduce impersonality and the kind of atomization that comes from large crowds. While the architecture of the college is designed to help in this regard by giving ample opportunities for students to interact with one another, every effort shall be made to provide a sense of community that encourages belongingness, involvement and high spirits.
- Common problems shall addressed by the college and remedies sought as quickly as possible so that unaddressed problems do not cause more harm than what exists.

16.5. Class Size

To enable manageable faculty attention to students and assure the continuous assessment policy, the optimal class size of the college shall be:

- **25 to 35** students for courses in a regular class,
- **50 to 60** students for lecture type courses,
- **15 to 25** students for workshops and laboratories.

17. PROGRAM STRUCTURE

The bachelor programme in architecture is structured within five years study time and ends up with the bachelor thesis. The five-year curriculum complies with the structural requirements of the European practice and the international criteria of the UNESCO/UIA charter for architectural education. There shall be one internship program one year before the end of the program. During this period students will have a chance to work in an actual work setting using their competency.

The courses in the program are major, supportive and general courses. The major courses are compulsory and shall be 105 credit hours for one to graduate. The major, supportive and general courses are presented below.

- Crosscutting courses
- Professional studies
- Theory and history
- Communication skills
- Design
- Building construction techniques
- Sustainable housing strategies
- Building science
- Integrated projects
- Elective courses

18. LIST OF MODULE & COURSES

18.1. List of modules and courses

18.1.1. Professional Studies

Table 2: Professional studies courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
1	**Professional Studies**	Arch 512	Theory of architectural practice	2
		Arch 611	Architectural practice and management	2
		Arch 612	Construction Management	3
			Total	7

18.1.2. Theory and History

Table 3 Theory and History courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
2	Theory and History	Arch 322	History of architecture I	3
		Arch 421	History of architecture II	3
		Arch 424	History of Ethiopian Architecture	3
		Arch 422	Theory of Architecture I	3
		Arch 521	Theory of Architecture II	3
			Total	15

18.1.3. Communication Skills Courses

Table 4.Communication skills courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
3	**Communication Skills**	Arch 231	Communication skills I	3
		Arch 232	Communication skills II	4
		Arch 331	Communication skills III	4
		Arch 332	Communication skills IV	3
		Arch 431	Communication skills V	3
		Arch 334	3D Modeling Workshop	3
			Total	20

18.1.4. Design Courses

Table 5: Design courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
4	**Design**	Arch 242	Basic Design I	3
		Arch 341	Basic Design II	3
		Arch 441	Architectural design I	4
		Arch 442	Architectural design II	2
		Arch 541	Architectural design III	2
		Arch 542	Architectural design IV	2
		Arch 443	Urban Design	3
		Arch 543	Urban Planning	3
		Arch 445	Landscape architecture	2
		Arch 545	Ecological Architecture	2
		Arch 642	Bachelor Thesis	12
			Total	38

18.1.5. Building Construction and Techniques courses

Table 6: Building Construction and Techniques courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
5	**Building Construction and Techniques**	Arch 252	Building materials & construction I	3
		Arch 351	Building materials & construction II	3
		Arch 352	Building materials & construction III	3
		Arch 254	Workshop I	2
		Arch 355	Workshop II	2
		Arch 353	Theory & design of structures I	3
		Arch 354	Theory and design of structures II	3
		Arch 451	Surveying	2
			Total	21

18.1.6. Sustainable Housing Strategies Courses

Table 7: Sustainable Housing Strategies courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
6	**Sustainable Housing Strategies**	Arch 562	Appropriate building technology	3
		Arch 661	Low-cost strategies in design	2
			Total	5

18.1.7. Building Science Courses

Table 8: Building Science courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
7	**Building Science**	Arch 471	Architectural Science I (Electrical)	3
		Arch 472	Architectural Science II (Water, heating, cooling & ventilation)	3
		Arch 571	Architectural Science III (Lighting, acoustics)	3
			Total	9

18.1.8. Integrated Courses

Table 9: Integrated courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
8	**Integrated Projects**	Arch 281	Introductory design project	2
		Arch 482	A coordinated design project I	5
		Arch 581	A coordinated design project II	5
		Arch 582	A coordinated design project III	5
		Arch 681	A coordinated design project IV	5
			Total	22

18.1.9. Elective courses

Table 10: Elective courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
9	**Elective courses**	Arch 691	Interior design	3
		Arch 692	Architecture of the Future	3
		Arch 693	Advanced urban design	3
		Arch 694	Restoration & preservation	3
		Arch 695	Advanced Landscape architecture	3
		Arch 696	Advanced building structures	3
			Total	9

18.1.10. Supportive courses

Table 11: Supportive courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
10	**Support courses**	MATH 231	Applied Mathematics I	3
		MATH 232	Applied Mathematics II	3
		PHYS 205	Applied Physics for Architecture	3
		COMP 201	Computer Applications	3
		MAEN 222	Introduction to Management	3
		MAEN 441	Leadership Skills	3
			Total	18

18.1.11. Crosscutting Courses

Table 12: Crosscutting Courses

Module No.	Module name	Code	Courses of the module	Credit Hrs.
11	**Crosscutting Courses**	CEED 201	Civic and Ethical Education	3
		FLEN 201	Sophomore English	3
		FLEN 202	Professional Writing	3
		FLEN 301	Communication, Presentation Skills	3
		PHIL 201	Introduction to Philosophy(Logic)	3
		PSYC 201	General Psychology	3
			Total	18

19. LIST OF COURSES BY SEMESTERS

19.1. For Regular students

19.1.1. First year courses by semesters

Table 13: List of courses for first year by semesters

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
I	1	Arch 242	Basic design I	3	1	6	7
		Arch 231	Communication skills I	3	1	6	7
		PHYS 205	Applied Physics for Architecture	3	2	3	6
		PHIL 201	Introduction to Philosophy(Logic)	3	3	-	4
		Math 231	Applied Mathematics I	3	2	3	6
		FLEN 201	Sophomore English	3	3	-	4
			Total	17			29
	2	Arch 341	Basic design II	3	1	6	7
		Arch 232	Communication skills II	4	2	6	7
		Arch 254	Workshop I	2	1	3	3
		Arch 252	Building materials & construction I	3	2	3	5
		MATH 232	Applied Mathematics II	3	2	3	4
		FLEN 202	Professional Writing	3	3	-	4
			Total	18			30

19.1.2. Second year courses by semesters

Table 14: Second year courses by semesters

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
II	3	Arch 441	Architectural design I	4	2	6	8
		Arch 331	Communication skills III	4	2	6	6
		Arch 355	Workshop II	2	1	3	4
		Arch 351	Building materials & construction II	3	2	3	5
		Arch 322	History of architecture I	3	3	-	4
		FLEN 301	Communication, Presentation Skills	2	1	3	4
			Total	18			30
	4	Arch 442	Architectural design II	3	1	6	4
		Arch 332	Communication skills IV	3	1	6	5
		Arch 543	Urban Planning	3	2	3	4
		Arch 352	Building materials & construction III	3	2	3	5
		Arch 421	History of Architecture II	3	3	-	4
		Arch 334	3D Modelling Workshop	3	1	7	3
			Total	18			29

19.1.3. Third year courses by semesters

Table 15: Third year courses by semesters

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
III	5	Arch 541	Architectural design III	3	1	6	4
		Arch 431	Communication skills V	3	1	6	5
		Arch 353	Theory & design of structures I	3	2	3	4
		Arch 443	Urban design	3	2	3	4
		Arch 424	History of Ethiopian architecture	3	3	-	4
		Arch 471	Architectural Science I (Electrical.)	3	2	3	5
			Total	18			30
	6	Arch 542	Architectural design IV	3	1	6	4
		Arch 354	Theory & design of structures II	3	2	3	5
		PSYC 201	General Psychology	2	2	-	3
		Arch 281	Introductory design project	2	1	1	2
		Arch 472	Architectural Science II (Water, heating, cooling and ventilation)	3	2	3	5
		Arch 482	A coordinated design project I	5	2	9	10
			Total	18			30

19.1.4. Fourth year courses by semesters

Table 16: Fourth year courses by semesters

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
IV	7	Arch 451	Surveying for Architects	2	1	3	3
		Arch 445	Landscape architecture	2	1	3	4
		Arch 422	Theory of architecture I	3	3	-	4
		MAEN 222	Introduction to Management	3	3	-	4
		Arch 571	Architectural Science III (Lighting, acoustics)	3	2	3	4
		Arch 581	A coordinated design project II	5	2	9	10
			Total	18			30
	8	Arch 512	Theory of architectural practice	2	2	-	3
		Arch 545	Ecological architecture	2	1	3	4
		Arch 521	Theory of Architecture II	3	3	-	4
		Arch 562	Appropriate building technology	3	2	3	4
		MAEN 441	Leadership Skills	3	3	-	4
		Arch 582	A coordinated design project III	5	2	9	10
			Total	18			29

19.1.5. Internship course (summer courses)

Table 17 summer courses

Semester	Course Name	Credit Hrs.	Contact Hrs.	Credit Points
Summer	Internship			30

19.1.6. Fifth year courses by semesters

Table 18: Fifth year courses by semesters

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
V	9	Arch 611	Architectural practice and management	2	2	-	3
		Arch 661	Low-cost strategies in design	2	1	3	4
		Arch 681	A coordinated design project IV	5	2	9	10
		Arch 691	Interior design	3	2	3	4
		CEED 202	Professional Ethics	3	3	-	5
		Arch 612	Construction management	3	3	-	4
			Total	**18**			**29**
		Arch 693	Advanced urban design	[3]	2	3	[4]
	10*	Arch 695	Advanced Landscape architecture	[3]	2	3	[4]
		Arch 692	Architecture of the future	[3]	2	3	[4]
		Arch 694	Restoration & preservation	[3]	2	3	[4]
		Arch 696	Advanced building structures	[3]	2	3	[4]
		Arch 642	Bachelor Thesis	12	-	12	22
			Total	18			30

19.2. For Extension students

19.2.1. First year courses by semesters (EXTENSION STUDENTS)

Table 19: List of courses for first year by semesters (EXTENSION STUDENTS)

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
I	1	Arch 231	Communication skills I	4	2	6	9
		FLEN 201	Sophomore English	3	3	1	3
		Math 231	Applied Mathematics I	3	2	3	6
			Total	**10**			18
	2	PHIL 201	Introduction to Philosophy(Logic)	3	3	-	4
		Arch 281	Introductory design project	2	1	3	4
		Arch 254	Workshop I	2	1	3	4
		PHYS 205	Applied Physics for Architecture	3	2	3	6
			Total	10			18
	3	MATH 232	Applied Mathematics II	3	2	3	4
		Arch 232	Communication skills II	4	2	6	7
		Arch 242	Basic design I	3	1	6	7
			Total	10			18

19.2.2. Second year courses by semesters (EXTENSION STUDENTS)

Table 20: Second year courses by semesters (EXTENSION STUDENTS)

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
II	4	Arch 252	Building materials & construction I	3	2	3	6
		FLEN 202	Professional Writing	3	3	1	3
		Arch 341	Basic design II	3	1	6	8
			Total	9			17
	5	Arch 355	Workshop II	2	1	3	4
		Arch 331	Communication skills III	4	2	6	9
		CEED 201	Civics and Ethical Education	3	3	-	3
			Total	9			16
	6	FLEN 301	Communication, Presentation Skills	3	3	1	3
		Arch 353	Theory & design of structures I	3	2	3	6
		Arch 351	Building materials & construction II	3	2	3	6
			Total	9			15

19.2.3. Third year courses by semesters (EXTENSION STUDENTS)

Table 21: Third year courses by semesters (EXTENSION STUDENTS)

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
III	7	Arch 322	History of architecture I	3	3	-	3
		Arch 332	Communication skills IV	3	1	6	9
		Arch 352	Building materials & construction III	3	2	3	6
			Total				
	8	Arch 421	History of Architecture II	3	3	-	3
		Arch 354	Theory & design of structures II	3	2	3	6
		Arch 334	3D Modelling Workshop	3	1	7	9
			Total	18			30
	9	Arch 431	Communication skills V	3	1	6	9
		Arch 441	Architectural design I	4	2	6	9
		Arch 443	Urban design	3	2	3	5
			Total	18			30

19.2.4. Fourth year courses by semesters (EXTENSION STUDENTS)

Table 22: Fourth year courses by semesters (EXTENSION STUDENTS)

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
IV	10	Arch 445	Landscape architecture	2	1	3	5
		Arch 422	Theory of architecture I	3	3	-	3
		Arch 471	Architectural Science I (Electrical.)	3	2	3	5
		Arch 442	Architectural design II	2	1	3	6
			Total	10			18
	11	Arch 451	Surveying	2	1	3	5
		Arch 472	Architectural Science II (Water, heating, cooling and ventilation)	3	2	3	5
		Arch 482	A coordinated design project I	5	2	9	11
			Total	10			21
	12	Arch 521	Theory of Architecture II	3	3	-	3
		Arch 424	History of Ethiopian architecture	3	3	-	3
		Arch 541	Architectural design III	2	1	3	6
		Arch 543	Urban Planning	3	2	3	5
			Total	11			17

19.2.5. Internship course (EXTENSION STUDENTS)

Table 23 summer courses (EXTENSION STUDENTS)

Year	Semester	Course Name	Credit Hrs.	Contact Hrs.	Credit Points
V	13	Internship			30

19.2.6. Fifth year courses by semesters (EXTENSION STUDENTS)

Table 24: Fifth year courses by semesters (EXTENSION STUDENTS)

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
V	14	Arch 545	Ecological architecture	2	1	3	5
		Arch 571	Architectural Science III (Lighting, acoustics)	3	2	3	5
		Arch 581	A coordinated design project II	5	2	9	11
			Total				
	15	Arch 512	Theory of architectural practice	2	2	-	3
		Arch 542	Architectural design IV	2	1	3	6
		PSYC 201	General **Psychology**	3	3	-	3
		Arch 562	Appropriate building technology	3	2	3	6
			Total	**10**			**18**
	16	MAEN 441	Leadership Skills	3	3	-	4
		Arch 582	A coordinated design project III	5	2	9	11
		Arch 611	Architectural practice and management	2	2	-	3
			Total	10			18

19.2.1. Sixth year courses by semesters (EXTENSION STUDENTS)

Table 25: Sixth year courses by semesters (EXTENSION STUDENTS)

Year	Semester	Course No	Course Name	Credit Hrs.	Contact Hrs.		Credit Points
					Lect.	Lab.	
V	17	Arch 661	Low-cost strategies in design	2	1	3	6
		Arch 681	A coordinated design project IV	5	2	9	11
		Arch 691	Interior design	[3]	2	3	[5]
		Arch 693	Advanced urban design	[3]	2	3	[5]
		Arch 695	Advanced Landscape architecture	[3]	2	3	[5]
			Total	**11**			**22**
	18	MAEN 222	Introduction to Management	3	3	-	4
		Arch 612	Construction management	3	3	-	4
		Arch 692	Architecture of the future	[3]	2	3	[5]
		Arch 694	Restoration & preservation	[3]	2	3	[5]
		Arch 696	Advanced building structures	[3]	2	3	[5]
			Total	12			18
	19	Arch 642	Bachelor Thesis	**12**	-	12	22
			Total	12			22

*In Sixth year semester students will choose to take two elective courses out of three and in sixth year both first & second semester one out of three.

20. MODULES COURSE AND DESCRIPTIONS

20.1. Module-1: Professional Studies

Teaching & learning methods: Lectures, research papers
Evaluation methods: Written examination, Research paper evaluation
Required knowledge and capabilities

- Ability to act with knowledge of professional, business, financial and legal contexts.
- Ability to understand different forms of procurement of architectural services.
- Awareness of the workings of the construction and development industries, financial dynamics, real estate investment, and facilities management.
- Awareness of the potential roles of architects in conventional and new areas of activity and in an international context.
- Understanding of business principles and their application to the development of built environments, project management and the functioning of a professional consultancy.
- Understanding of professional ethics and codes of conduct as they apply to the practice of architecture and of the architect's legal responsibilities where registration, practice and building contracts are concerned.

20.1.1. Courses of the module

Table 26: Module-1: Professional Studies (Course lists)

Course names	Course no	Credit points (ECTS)
Theory of architectural practice	Arch 512	3 CP
Architectural practice & management	Arch 611	3 CP
Construction Management	Arch 612	CP 4

20.2. Module-1: Course Descriptions

20.2.1. Course Title: THEORY OF ARCHITECTURAL PRACTICE

Course Number: Arch 512

Credit Hour: 2 Cr. Hrs. (Lect. 2Hrs)

Prerequisite: None

20.2.1.1. Course Description

The course aims to enable students to have a thorough knowledge about the career of an architect in the construction industry and understanding of the business or management aspects of the profession. It will give them a solid grasp of contract administration processes. It will also familiarize the students with methods for carrying out supervision work of building projects.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. To familiarize students with building codes, local rules and regulations that should be integrated and respected in their designs in order to process building permit license and to respect laws
2. Recognize how the architectural design process affects or is affected by political, legal, social, cultural, economic, and ethical dimensions.
3. Integrate theoretical principles with practical knowledge in the field of architecture and as practicing architects
4. Familiarize students with the laws and regulations that govern the practice

Instructional Methods
Lectures, Exercises, Seminars
Assessment Method
Exercise evaluation, written examination, Seminar evaluation
Assignments:
a) Applying Ethiopian Building codes and standards to design and construction projects
b) Contract procedure, agreement forms
Seminar: Employment options of the architect
Exercise: specification writing and quantity surveying
Role of instructor
Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Students are expected to attend all classes, do assignments, collect and incorporate feedbacks and participate in course activities. Students will work on both individual and collaborative projects during and outside of class time. Students will present work in class and participate in peer critiques.
Text Book
Becoming an Architect: A Guide to Careers in Design, By Lee W. Waldrep, (2009), ISBN: 978-0470372104
Architect's Essentials of Starting, Assessing and Transitioning a Design Firm (The Architect's Essentials of Professional Practice) by Peter Piven and Bradford Perkins (Mar 21, 2008) ISBN-13: 978-0470261064
References
The Architect in Practice, David Chappell, and J.Andrew Willis, (2010), ISBN: 978-1405198523
Evaluation Scheme

Assignments and quizzes	40%
Mid-term	20%
Final Examination	40%

20.2.2. Course Title: ARCHITECTURAL PRACTICE AND MANAGEMENT

Course Number: Arch 611

Credit Hour: 2(Lect. 2Hrs)

Prerequisite: Arch 512

20.2.2.1. Course Description

The purpose of this course is to familiarize students to specification writing for building projects as well as quantity surveying. They will learn how to handle and manage contracts. The course will equip the students with the skills to make calculations to estimate construction costs.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand Contract Documents and recruitment methods for Funding of construction projects.
2. Develop skill in estimating project cost and property valuation.
3. Understand the theory and practice of specification writing and quantity surveying
4. Gain experience and exercise in specification writing and quantity surveying.

Instructional Methods

Lectures, research papers

Assessment Method

Quizzes, written examination, research paper evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

Building Codes Illustrated: A Guide to Understanding the 2009 International Building Code by Frank Ching (Sep 22, 2009), ISBN-13: 978-0470191439

References

Ethics and the Practice of Architecture by Barry Wasserman, Patrick J. Sullivan, Gregory Palermo, Wiley, 1st edition (2000), ISBN-13: 978-0471298229

Construction Planning, Programming and Control by Brian Cooke and Peter Williams, Wiley-Blackwell; 3 edition (February 17, 2009) ISBN-10: 9781405183802 , ISBN-13: 978-1405183802

Evaluation Scheme

Assignments and quizzes	20%
Mid-term	30%
Final Examination	50%

20.2.3. Course Title: CONSTRUCTION MANAGEMENT

Course Number: Arch 612

Credit Hour: 3(Lect. 3Hrs)

Prerequisite: None

20.2.3.1. Course Description

The purpose of the course is to discuss the organization, management and practice of the architectural profession including discussions on ethics and professional judgment, leadership as well as legal and regulatory issues.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Define and discuss architectural practice as it relates to firm organization and management
2. Discuss concepts related to running a practice including financial planning, management systems, and risk management strategies.
3. Define and discuss Architect's Project Management Roles and how to implement project cost control measures on typical architectural projects
4. Define and discuss Ethics and Professional Judgment as they relate to contemporary architectural practice
5. Define and discuss Legal Rights and Responsibilities in relation to architectural practice

Instructional Methods

Lectures, research papers

Assessment Method

Quizzes, written examination, research paper evaluation

Assignments :

a)the legal context in practice

b)Architectural practice around the world

c)Applying codes of ethics in everyday practice

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Books

Facilities Planning, 4th Ed., Tompkins et al., 2010

References

Project Management Planning and Control Techniques 4th ed., Rory Burke, John Wiley and Sons, Ltd., 2008, ISBN10:0958273343.

Project Management, 2nd ed., Gray, Clifford F. & Erik W., 2003

Evaluation Scheme

Assignments and quizzes	40%
Mid-term	20%
Final Examination	40%

20.3. Module-2: Theory & History

Among teaching & learning methods: Lectures, Demonstration, Seminars, Excursions Evaluation

Methods: Written examination, Oral examination, Seminar evaluation

Required knowledge and capabilities

- Ability to act with knowledge of historical and cultural precedents in local and world architecture.
- Ability to act with knowledge of the fine arts as an influence on the quality of architectural design.
- Understanding of heritage issues in the built environment. Awareness of the links between architecture and other creative disciplines.
- Ability to act with knowledge of society, clients and users.
- Ability to develop a project brief through definition of the needs of society, users and clients, and to research and define contextual and functional requirements for different types of built environments.
- Understanding of the social context in which built environments are procured, of ergonomic and space requirements and issues of equity and access.
- Awareness of the relevant codes, regulations and standards for planning, design, construction, health, safety and use of built environments.
- Awareness of philosophy, politics, and ethics as related to architecture. Skill in carrying out scientific research in the field of architecture and architectural design

20.3.1. Courses of the module

Table 27: Module-2: Theory & History (Course lists)

Course names	Course no	Credit points (ECTS)
History of architecture	Arch 322	4 CP
History of architecture II	Arch 421	4 CP
History of Ethiopian architecture	Arch 424	4 CP
Theory of architecture I	Arch 422	4 CP
Theory of architecture II	Arch 521	4 CP

20.4. Module-2: Course Discriptions

20.4.1. Course Title: HISTORY OF ARCHITECTURE I

Course Number: Arch 422

Credit Hour: 3(Lect. 3Hrs)

Prerequisite: None

20.4.2. Course Description

The course will provide a basis for understanding of topics and methods of the history of arts and architecture. It will give a review of the historical development of architecture and planning with special emphasis on Ethiopian topics.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Give an analytical account of the art and architecture of the earliest civilizations up to the 20th Century.
2. Appreciate Medieval and Romanesque, Gothic, Renaissance, Baroque and Rococo architecture,
3. Appreciate Neo-Classicism Romanticism, Eclecticism, Art Noveau, Werkbund,Constructivism, Bauhaus and Expressionism .

Instructional methods

Lectures, Demonstration, Seminars, Excursions

Assessment methods

Written examination, Oral examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

A History of Architecture on the Comparative Method by Banister Fletcher, General Books LLC (March 26, 2010), ISBN-10: 1154729834, ISBN-13: 978-1154729832

Evaluation Scheme

Assignments and quizzes	10%
Research Paper	20%
Mid-term	30%
Final Examination	40%

20.4.3. Course Title: HISTORY OF ARCHITECTURE II

Course Number:Arch 421
Credit Hour: 3(Lect. 3Hrs)
Prerequisite: Arch 322

20.4.3.1. Course Description

The course shall give the students an all-round knowledge of the origins of modern architecture and town planning up to the current status considering the relationship to actual social and philosophical movements.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Appreciate the functionalist and formalist Architecture at mid-20th century.
2. Become familiar with various trends and architectural movements of the modern movement like: Barometric, Pragmatic, Organic metabolism, Structural Rationalism, Historicism, New-Liberty, the International style, Late and Post-Modern Architecture, De constructivism and current trends.

Instructional methods

Lectures, Demonstration, Seminars, Excursions

Assessment methods

Written examination, Oral examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

Modern Architecture: A Critical History (Fourth Edition) (World of Art) by Kenneth Frampton, Thames & Hudson; Fourth Edition,(September 30, 2007) , ISBN-10: 9780500203958, ISBN-13: 978-0500203958

Evaluation Scheme

Assignments and quizzes	10%
Research Paper	20%
Mid-term	30%
Final Examination	40%

20.4.4. Course Title: ETHIOPIAN HISTORY OF ARCHITECTURE

Course Number: Arch 424
Credit Hour: 3(Lect. 3Hrs)
Prerequisite: Arch 421

20.4.4.1. Course Description

This course intends to provide an understanding of general tendencies and local diversities in history of Ethiopian architecture. It will enable students to examine local architectural traditions critically.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Know about the ancient: Pre-Axumite and Axumite period and historic cities and their architecture:
2. Know about Axum, Harar, Gondar, Rock and cave churches: Tigray and Lasta (Lalibela). Axumite, medieval, and the Gonderian period. Vernacular Architecture. Addis Ababa: Early and Italian occupation, Modern.
3. Understand City development and architecture and current trends.
4. Visit sites in Ethiopia to meet a variety of historic architecture in Ethiopia.

Instructional methods

Lectures, Demonstration, Seminars, Excursions

Assessment methods

Written examination, Oral examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Evaluation Scheme

Assignments and quizzes	10%
Research paper	20
Mid-term	30%
Final Examination	40%

20.4.5. Course Title: THEORY OF ARCHITECTURE I

Course Number:Arch 422

Credit Hour: 3(Lect. 3Hrs)

Prerequisite: Arch 421

20.4.5.1. Course Description

The main objective of the course is to introduce students to the Professional practice of architecture. It prepares and equips students with legal principles related to architectural practice and professional codes of conduct in the building industry. It introduces and familiarizes students with quantity surveying, cost calculation, specifying and bill of quantity preparation

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. To familiarize students with building codes, local rules and regulations that should be integrated and respected in their designs in order to process building permit license and to respect laws
2. Recognize how the architectural design process affects or is affected by political, legal, social, cultural, economic, and ethical dimensions.
3. Integrate theoretical principles with practical knowledge in the field of architecture and as practicing architects
4. Familiarize students with the laws and regulations that govern the practice

Instructional methods

Lectures, Demonstration, Seminars, Excursions

Assessment methods

Written examination, Oral examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Textbook

Becoming an Architect: A Guide to Careers in Design
By Lee W. Waldrep;
John Wiley (2006)
Architects guide to running a job
By Ronald Green.
Architectural Press; 6th edition (2001)
The Architect in Practice
By David Chappell, and J.Andrew Willis;
Blackwell Publishing; 9Rev edition (2005)
Sustainable practice in the built environment
By Craig Langston.
Butterworth-Heinemann; 2nd edition (2001)
Towards a New Architecture by Le Corbusier, BN Publishing (September 12, 2008)
ISBN-10: 9650060367, ISBN-13: 978-9650060367

References

The Ten Books on Architecture by Marcus Vitruvius Pollio (c.90 BC-c. 20 BC), Dover Publications (1960), ISBN-13: 978-1421270111, Reprint: Kessinger Publishing, LLC (September 10, 2010)
ISBN-10: 1169330223, ISBN-13: 978-1169330221
The Theory of Architecture: Concepts, Themes and Practices By Paul Alan Johnson, Wiley (1994), ISBN-13: 978-047128533

Evaluation Scheme

Assignments and quizzes 40%
Mid-term 20%
Final Examination 40%

20.4.6. Course Title: THEORY OF ARCHITECTURE II

Course Number:Arch 521
Credit Hour: 3(Lect. 3Hrs)
Prerequisite: Arch 422

20.4.6.1. Course Description

The course shall give the students an all-round knowledge about specific architectural problems as they emerge in current theory and practice. It will also enable students to have a firm grasp of theories by involving them with projects of a theoretical nature.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand advanced theories and approaches in Architecture:
2. Appreciate Historiography and scientific art and architecture.
3. Understand Universalism versus regionalism; Ideology and symbolism.
4. Discuss current theories in architecture.

Instructional methods

Lectures, Demonstration, Seminars, Excursions

Assessment methods

Written examination, Oral examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

Architectural Regionalism: Collected Writings on Place, Identity, Modernity and Tradition, Vincent B. Canizaro (Editor) Princeton Architectural Press; 1st edition (2006), ISBN-13: 978-1568986166

References

Complexity and Contradiction in Architecture by Robert Venturi, "The Museum of Modern Art, New York"; 2nd edition (2002), ISBN-13: 978-0870702822

Makers of Modern Architecture: from Frank Lloyd Wright to Frank Gehry by Martin Filler, New York Review Books (2007), ISBN-13: 978-1590172278

Evaluation Scheme

Assignments and quizzes	20%
Mid-term	30%
Final Examination	50%

20.5. Module-3: Communication skills

Teaching & learning methods: Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial

Evaluation methods: Exercise evaluation, Seminar evaluation

Required knowledge and capabilities

- Ability to act and to communicate ideas through collaboration, speaking, numeracy, writing, drawing, modelling and evaluation.
- Ability to utilize manual and electronic graphic and model making capabilities to explore, develop, define and communicate a design proposal.
- Understanding of systems of evaluation that use manual and/or electronic means, for performance assessments of built environments.

20.5.1. Courses of the module

Table 28: Module-3: Communication skills (Course lists)

Course names	Course no	Credit points (ECTS)
Communication skills I -	Arch 231	7 CP
Communication skills II	Arch 232	7 CP
Communication skills III	Arch 331	5 CP
Communication skills IV	Arch 332	5 CP
3DModeling Workshop	Arch 334	3 CP
Communication skills V	Arch 431	5 CP

20.6. Module-3: Course Descriptions

20.6.1. Course Title: COMMUNICATION SKILLS I (Introduction to Engineering Drawing & Visualization)

Course Number:Arch 231

Credit Hour: 3(Lect. 1Hr, Studio 6Hrs)

Prerequisite: None

20.6.1.1. Course Description

This course basically focus on drafting principles & techniques, applied descriptive & solid geometry; the development of skills in orthographic projection & reproduction techniques, and Architectural lettering techniques. It includes: Free hand sketching of simple geometric objects, Introduction to different sketching media, Introduction to drafting techniques, Use and care of instruments, Scale and scale conversion, Simple geometric constructions, orthographic Projection, Descriptive geometry, lines, surfaces intersections of planes, intersections of solids and developments.

20.6.1.2. Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Become familiar with different sketching media and architectural lettering techniques.
2. Do free hand sketching of simple geometric objects.
3. Develop the understanding of drawing including the use and care of instruments, scale and scale conversion,
4. Construct simple geometric objects and orthographic representations of simple objects
5. Apply principles of descriptive geometry and pattern development to describe geometrical properties of geometric elements.

Instructional methods

Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial

Evaluation methods

Exercise evaluation, Seminar evaluation

Role of instructor

Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Textbook: Architectural Graphics, 5th Ed., F. Ching, 2009

Reference

Drawing and Perceiving: Real-World Drawing for Students of Architecture and Design by Douglas Cooper (Jan 29, 2007), Wiley; 4 edition (January 29, 2007) ISBN-10: 9780470047163, ISBN-13: 978-0470047163

FreeHand Sketching: An Introduction By Paul Laseau, W. W. Norton & Company (2004) , ISBN-13: 978-0393731125

Technical Sketching with an Introduction to AutoCAD (4th Edition) by Dale H. Besterfield and Robert E. O'Hagan, Prentice Hall; 4 edition (August 27, 2006), ISBN-10: 0132432781, ISBN-13: 978-0132432788

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.6.2. Course Title: COMMUNICATION SKILLS II (Graphic Visualization & Representation Techniques)

Course Number:Arch 232

Credit Hour: 4 (Lect. 2Hrs, Studio 6Hrs)

Prerequisite: Arch 231

20.6.2.1. Course Description

This course focuses on the use of various graphic visualization & representation techniques such as: perspectives and parallel projection techniques in the conception & communication of space & design and to describe and stimulate the spirit of our physical environment using both freehand hand sketching and instrumental drawing in 2D and 3D ways of representations. It emphasizes on free hand sketching of complex compositions precisely, Architectural graphic standards and symbols; preparation of architectural floor plans, elevations and site plans, axonometric (Isometric) & Oblique representations, perspective projections simple objects and architectural building. Rendering techniques of presentation drawings, Shade and shadow & reflection of simple objects will be discussed in details. The course extends student application of design principles and elements by covering the development of 2D and 3D graphic communication techniques in creating preliminary and final presentations to convey design concepts and solutions using perspective drawings, axonometric, presentation boards, 3D models, freehand sketching and rendered drawings using pen and ink and colour media.

Course Objectives (Outcomes)

The course aims to enable students to:

1. Do free hand sketching of complex objects and architectural drawings.
2. Become familiar with the various parallel projections (Axonometric and Oblique) and perspective (one and two point) projections techniques.
3. Develop the understanding and skill of representing our physical environment.
4. Produce architectural floor plans and elevations as well as the site plans.
5. Apply rendering, shade and shadow principles to produce simple presentation drawing.
6. Develop their observational skills; improve artistic expressions, formal synthesis and recording spatial images (landscapes) through both instrumental and freehand sketching.

Instructional methods

Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial

Evaluation methods

Exercise evaluation, Seminar evaluation

Role of instructor

Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Textbook

Drafting and Design for Architecture, D. Helper, P. Wallach, and D. Hepler, 2006

Reference books

Technical Drawing 3 Building Drawing; By Ezeji, S. C. O. A Longman (1992)

From Line to Design: Design Graphics Communication ;By Vandyke, Scott John Wiley & Sons Inc; 3 Sub edition (1990)

Architectural Drafting & Design By Alan Jefferis, David A. Madsen Thomson Delmar Learning; 5th edition (2004)

Introduction To Architectural Presentation Graphics By Anthony Prentice Hall; 1st edition (1997)

Graphic Thinking for Architects and Designers by Paul Laseau Wiley; 3 Sub edition (2000)

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.6.3. Course Title: COMMUNICATION SKILLS III (Architectural Presentation Techniques)

Course Number:Arch 331
Credit Hour: 4(Lect. 2Hrs, Studio 6Hrs)
Prerequisite: Arch 232

20.6.3.1. Course Description

The use of mixed media, photographic representation processes & model-making techniques, coupled with the principles & strategies behind various packaging techniques for architectural presentations is the fundamental emphasis of this course. It includes a brief description on History of Computers, hardware, software and detailed discussion of the use of basic 2D AutoCAD & Arch-CAD drafting tools and other graphic software such as Rivet etc... The application of advanced rendering techniques, shade and shadow & reflection skills in the preparation architectural presentation drawing of floor plans, elevations and site plans in details using both freehand drawing or instruments and appropriate computer based graphic software will be the core focus. This course is designed to extend students' skills on an intensive hand-drafting, freehand sketching, and hand-rendering course and to allow students to translate their hand-drafting, sketching and rendering skills into a design pedagogy rooted in computer-aided drafting and design software. Students will learn not only how to transfer hand-drafting projects into CAD software, but also, more importantly, how to represent large residential and small commercial spaces using a combination of sketching, hand-drafting, computer-aided drafting, and computer-aided and hand-rendering.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Do free hand sketching of buildings and landscape.
2. Become familiar with the various graphic software packages and the rendering techniques.
3. Develop the skill of using the various packages to prepare architectural presentations.
4. Prepare presentation drawing of architectural floor plans and elevations and the site plans.
5. Select and apply appropriate software in the preparation of 2D presentation drawing.
6. Develop the skill to produce improved artistic expressions, formal synthesis and recording 2D spatial images through the use of instruments and computer

Instructional methods

Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial

Evaluation methods

Exercise evaluation, Seminar evaluation

Role of instructor

Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Textbook

Architectural Drawing and Light Construction, E. Muller, P. Grau, J. Fausett, 2005

References

AutoCAD Architecture Fundamentals, 2008
Architecture, Design, Engineering and Drawing, Spence, William, 1991

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.6.4. Course Title: COMMUNICATION SKILLS IV (Introduction to Computer-Aided Design & Digital Visualization)

Course Number:Arch 332
Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)
Prerequisite: Arch 331

20.6.4.1. Course Description

This course focuses on the advanced use of various computer software & digital media as tools for architectural presentation & design. It includes: the use of 3D AutoCAD drafting; isometric drawings, simple 3D models, creating surface models, rendering in 3D: material, light, shading, and perspectives, and data exchange with other applications. The applications of various commercial graphic packages such as: 3D-Max, Adobe Photoshop, Illustrator and Page maker, Artilants, and Sketch up in preparation of architectural presentation drawing will be the core focus of the course. This graphics skill is designed to extend students' skills from, an intensive hand-drafting, freehand sketching, and hand-rendering course to an intensive computer-aided drafting and design software which will allow students to translate their hand-drafting, sketching and rendering skills into a design approaches rooted in computer-aided drafting and design software. Students will learn more importantly, how to design, compose and visualize various architectural spaces using a combination of sketching, hand-drafting, and the various computer-aided drafting and rendering techniques.

Course Objectives

On completion of this course students should be able to:

1. Do advanced 3D modelling of built environment and landscapes in the various packages environments.
2. Become equipped with the various graphic software packages and the rendering techniques.
3. Develop the creative skill of using the various packages to prepare architectural presentations.
4. Prepare advanced presentation drawing of architectural spaces.
5. Select and apply appropriate software in the preparation of 2D and 3D presentation drawing.
6. Develop the high level skill to produce improved artistic expressions, formal synthesis and recording of 2D and 3D spatial images through the use of the various computer aided approaches.

Instructional methods

Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial

Evaluation methods

Exercise evaluation, Seminar evaluation

Role of instructor

Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Reference Books

Architectural Representation Handbook: Traditional and Digital Techniques for Graphic Communication by Paul Laseau McGraw-Hill Professional Publishing; 1st edition (2000)
Foundation 3ds Max 8 Architectural Visualization by Brian L. Smith friends of ED; 1st edition (2006)
Reekie's Architectural Drawing Fraser Reekie Edward Arnold (1995)
Architectural Graphics: Traditional and Digital Communication By Glenn Goldman Prentice Hall (1996)

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.6.5. Course Title: COMMUNICATION SKILLS V (Advanced computer-aided design approaches in Architecture)

Course Number: Arch 431
Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)
Prerequisite: Arch 332

20.6.5.1. Course Description

The course focus on advanced computer-aided design approaches, expressions & techniques in architectural study & presentation. It includes: Watercolour, ink and wash, rendering techniques of presentation drawings, photographic techniques printing, developing, and photomontage, advanced perspective drawings. The use and applications of various commercial packages such as: Adobe Photoshop, Illustrator and Page maker, Artilants, Sketch up and Archi CAD, and 3D-Max are the principal emphasis of this course. High level accuracy and quality of photorealistic 3D modelling and visualization and geometrical data for testing of complex photogrammetric architectural object for dynamic 3D visualization of objects and buildings will be acquired. The application allows modifying the visualized 3D scene by looking at the object from any viewpoint to enable the rotation, translation and scale change, camera position reconstruction, etc. to permit dynamic realistic 3D visualization with simultaneous preservation of real geometrical relations and architectural space.
Course Objectives (Outcomes)
On completion of this course students should be able to:

1. Use watercolour, ink and wash and rendering techniques of presentation drawings, photographic techniques printing, developing, photomontage, and advanced rendering techniques.
2. Use High level accuracy and quality of photorealistic 3D modeling and visualizations
3. Evaluate and test complex photogrammetric architectural object for dynamic 3D visualization buildings
4. Create visualized 3D scene by looking at the object from any viewpoint to enable the rotation, translation and scale change, camera position
5. Apply the various soft wares such as: Adobe Photoshop, Illustrator and Page maker to produce design projects and reconstruction to permit dynamic realistic 3D visualization with simultaneous preservation of real geometrical relations and architectural space.

Instructional methods
Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial
Evaluation methods
Exercise evaluation, Seminar evaluation
Role of instructor
Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Attend classes and lab sessions, prepare lab reports, do assignments, self-study, present presentations, collect and incorporate feedbacks.
Text Book
Colour Drawing: Design Drawing Skills and Techniques for Architects, Landscape Architects, and Interior Designers by Michael E. Doyle, Wiley; 3 edition (November 17, 2006) ISBN-10:9780471741909 ISBN-13: 978-0471741909
Reference
Architecture + Animation (Architectural Design) by Bob Fear, Academy Press (2001) ISBN-13: 978-0471496298
Photographing Architecture and Interiors, Julius Shulman Princeton Architectural Press (2000)
Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.6.6. Course Title: 3D Modelling Workshop

Course Number: Arch 334
Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)
Prerequisite: Arch 331

20.6.6.1. Course Description

In the course the students will be to develop the ability to make models of conceptual and organizational constructs with different materials and tools. The students should learn how to develop and use physical modelling techniques to process complex design projects. The modelling shall introduce the students to problems of geometry in relation to material and structure. In addition, the course will help the students to apply the knowledge and skill of using the various software packages such as Revit architecture, AutoCAD, and other 3D generating and rendering packages.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Apply principles of descriptive geometry and pattern development in making physical models
2. Become familiar with different modelling techniques of architectural buildings.
3. Produce physical models of various objects and buildings at various scales.
4. Develop the understanding and use of 3D physical modelling for architectural presentations

Instructional methods

Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial

Evaluation methods

Exercise evaluation, Seminar evaluation

Role of instructor

Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

Designing with Models: A Studio Guide to Making and Using Architectural Design Models by Criss B. Mills, Wiley; 2 edition (2005) ISBN-13: 978-047164837

Reference

Model-Making: Materials and Methods by David Neat, Crowood Press (May 26, 2008) ISBN-10: 9781847970176
ISBN-13: 978-1847970176
Architectural Models: Construction Techniques, 2nd Edition

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.7. Module-4: Design Courses

Teaching & learning methods: Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion
Examination methods: Jury evaluation on projects (including external jury), seminar evaluation
Required knowledge and capabilities
The Design Studios are the core elements of the curriculum in the 2nd till 5th semester. In the studio the students will experience design techniques and processes with more and more complex design briefs. They are expected to develop a personal approach to architectural problems that will be reflected in their projects. In comparatively small groups of 15 -20 the students will be supervised in an intensive way. They will primarily gain the following abilities:

- Ability to engage the imagination, think creatively, innovative and provide design leadership.
- Ability to carry out architectural design in such a way as to satisfy not only aesthetics but also technical and functional requirements.
- Ability to gather information, defines problems, apply analyses and critical judgment and formulate strategies for design.
- Ability to incorporate into architectural design knowledge derived from various scientific fields.
- Knowledge of design theory and methods.
- Understanding of design procedures and processes.
- Knowledge of design precedents and architectural criticism.
- Ability to think three-dimensionally in the exploration of design.
- Ability to analyse buildings into their formal, functional and contextual aspects.

20.7.1. Courses of the module

Table 29: Module-4: Design (Course lists)

Course names	Course no	Credit points (ECTS)
Basic design I	Arch 242	7 CP
Basic design II	Arch 341	7 CP
Architectural design I	Arch 441	8 CP
Architectural design II	Arch 442	13 CP
Architectural design III	Arch 541	10 CP
Architectural design IV	Arch 542	10 CP
Urban Design	Arch 443	10 CP
Urban planning	Arch 543	3 CP
Landscape architecture	Arch 445	4 CP
Ecological architecture	Arch 545	5 CP
Bachelor thesis	Arch 642	22 CP

20.8. Module-4: Course Descriptions

20.8.1. Course Title: BASIC DESIGN-I

Course Number: Arch 242

Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)

Prerequisite: None

20.8.1.1. Course Description

This course is a base for coming Architectural and Urban Design courses. It deals with building blocks of any visual design called Elements of Design including points, lines, planes, texture & form, Then it explains how these design elements can be organized to create visual compositions using Principles of Design like harmony, rhythm, axis, repetition, emphasis, symmetry, balance, proportion, scale, datum, hierarchy, contrast etc. It also deals with form properties, creation, transformation, organization and articulation.

Course Objective (Outcomes)

Understanding design language (design elements and principles) helps any designer to come up with creative compositions (solutions). Hence the main objective of this course is to enable you broaden and enrich your vocabulary and grammar of the basis of any design. Hence at the end of the course, you will be able to:

1. Explain type, character and perception of design elements(K)
2. Identify principles and ways of organizing design elements (K)
3. Express different ideas and concepts using design elements and principles(S)
4. Communicate with related professional using design language(S)
5. Perceive visual compositions in different perspective (A)
6. Explore your surrounding environment in terms of design elements and principles (A)

Instructional methods

Comprehensive weekly detailed design exercises, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Exercises, Assignments, Presentation & Jury evaluation on projects

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Textbook

Architecture: Drafting and Design, Hepler, Donald 1987, 50 copies

Reference

Architecture: Form, Space, & Order, by Francis D. K. Ching, Wiley; 3rd Edition (2007), ISBN-13: 978-0471752165

Design & Technology, 1996, By James Garratt

Tools for Ideas: An Introduction to Architectural Design, by Christian Gänshirt Birkhäuser Basel; 1 edition (2007) ISBN-13: 978-3764375775

Course Evaluation

Weekly Assignments	50%
Exercises	20%
Semester Project	30%

20.8.2. Course Title: BASIC DESIGN II

Course Number:Arch 341
Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)
Prerequisite: Arch 242

20.8.2.1. Course Description

This course is a continuation of Basic Design I and it deals with advanced elements of design like: Space- Space Defining Element, Spatial (Space) Relationship, and Spatial (Space) Organization & Quality of Space. Colour- History of Colour, Nature of Colour, Theory of Colour, Colour Properties, Colour Harmony & Colour Psychology: Light& Shadow- Nature of light, Propriety of Light and Application of light in design.

Course Objective (Outcomes)

The main objective of the course is to enable you understand and apply basic elements of design like space, colour, shadow and light in design of simple compositions and elementary buildings.
At the end of the course, you will be able to:

1. Understand the nature, propriety and psychology of space, colour and light/shadow.
2. Apply space, colour and light in the design of compositions
3. Express different ideas and concepts using space, colour and light
4. Apply elements and principles of design in the design of small scale projects

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation, examinations

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks

Text Book

How Designers Think, Bryan Lawson, Architectural Press; 4th edition (2005)
ISBN-13: 978-0750660778

Reference

Architecture: Form, Space, & Order, by Francis D. K. Ching, Wiley; 3rd Edition (2007), ISBN-13: 978-0471752165

Design Thinking: Understanding How Designers Think and Work by Nigel Cross, Berg Publishers (May 15, 2011) ISBN-10: 9781847886361 ISBN-13: 978-1847886361

Language of Space, Bryan Lawson, Architectural Press; 1st edition (2001), ISBN-13: 978-0750652469

Course Evaluation

Weekly Assignments	50%
Exercises	20%
Semester Project	30%

20.8.3. Course Title: ARCHITECTURAL DESIGN I (Architecture for Residence)

Course Number:Arch 441
Credit Hour: 4(Lect. 2Hrs, Studio 6Hrs)
Prerequisite: Arch 232

20.8.3.1. Course Description

The purpose of this course is for the students to advance in their understanding of the architectural design processes and elements (Function, Space & Form) including communicating ideas and making artistic judgments. The course familiarizes students with the perception of Architectural Spaces and Forms and develops abilities to design simple spaces and compositions, by considering the site factors, functional activities and client requirements. It introduces students to the meaning and concept of Architecture and Architectural Design Process: Phases and Steps of Architectural Design Process. It familiars students with Site Factors: Climatic, Geological, Topographic, Circulation, Manmade, Sensory & Urban Context Design Factors. It introduces students to basic components of the building fabric: Function, Space, Form & Building Systems: Circulation, Structure, Roofing, Lighting, Ventilation…The theme of the course is to introduce students to design process and issues from simple (Villa) to moderate buildings (Apartment).

Semester Project:
Project I: Uniformly Multi-story Residential Building
Project II: Multi Family Multi-story Residential Building (No Software application totally)
Course Objective (Outcomes)
On completion of this course students should be able to:

1. Implement an iterative design process from problem identification, information gathering, solution generation and evaluation, implementation, presentation, and overall project evaluation.
2. Do literature review, precedent review, client, user and site analysis and incorporate them in the design process
3. Analyse and synthesize basic components of the building fabric for Residential Buildings: Function, Space & Building Systems: Circulation, Structure, Roofing, Lighting, Ventilation…
4. Understand the bylaws related to the project work
5. Undertake conceptualization, articulation and representation of architectural ideas and making aesthetic judgments of building design.
6. Express your design solutions graphically as well as using model.

Instructional methods
Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion
Assessment methods
Jury evaluation on projects (including external jury), assignments
Role of instructor
Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.
Text Book
Analysing Architecture, by Simon Unwin, Routledge; 2nd edition (2009), ISBN-13: 978-0415489287
Universal Principles of Design, Revised and Updated: 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design by William Lidwell, Kritina Holden and Jill Butler (Jan 1, 2010)
References
House Design, by Daab and Daab (2005) ISBN-13: 978-1876907426
Architectural Drawing and Light Construction,By Muller, Fauesett & Grau, 1999
Precedents in Architecture: Analytic Diagrams, Formative Ideas, and Parts, Roger H. Clark, Michael Pause, Wiley; 3 edition (2004) ISBN-13: 978-0471479741
Architecture: Form, Space, and Order by Frank Ching, Wiley; 3 edition (June 29, 2007) , ISBN-10: 0471752169 ISBN-13: 978-0471752165
Evaluation Scheme

Assignments	20%
Project I work	40%
Project II work	40%

20.8.4. Course Title: ARCHITECTURAL DESIGN II (Architecture for Commerce & Education)

Course Number:Arch 442
Credit Hour: 3(Lect. 1Hrs, Studio 6 Hrs.)
Prerequisite: Arch 441

20.8.4.1. Course Descriptions

The course aims to equip students with the basic analytical and methodological skills to deal with the design of moderately complex buildings such as for administration and education. The course familiarizes students with the perception of Architectural Spaces and Forms and develops abilities to design of moderately complex High Rise and Multi Block spaces, forms, functions and compositions. It introduces students to design issues in moderately complex High Rise and Multi Block Buildings like structural, circulation, parking, opening, wall, fire escape, building design service systems.

Semester Project:

Project I: Commercial Bldg.: High Rise Office /Mixed Use Building

Project II: Education Bldg.: School/ College/ Building

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Appreciate the methodological design approach to fairly complex High Rise and Multi Block Buildings.
2. Analysis of spatial, functional and formal configuration in fairly complex High Rise and Multi Block buildings for commerce, administration and education.
3. Synthesis of different building systems issues in moderately complex High Rise and Multi Block Buildings like structural, circulation, parking, opening, wall, fire escape, building design service systems.
4. Building appropriately through analysis of landscape and climate

Instructional methods

Comprehensive /detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), assignments

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Architecture of Schools: The New Learning Environments by Mark Dudek (Dec 15, 2000)

ISBN-13: 978-0750635851

References

Libraries and Learning Resources Centres: Planning and Design, Brian Edwards and Biddy Fisher ISBN-13: 978-1856176194

Architecture: Form, Space, and Order by Frank Ching, Wiley; 3 edition (June 29, 2007) , ISBN-10: 0471752169 ISBN-13: 978-0471752165

Evaluation Scheme

Assignments	20%
Project I	40%
Project II	40%

20.8.5. Course Title: ARCHITECTURAL DESIGN III (Architecture for recreation & culture)

Course Number:Arch 541
Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)
Prerequisite: Arch 442

20.8.5.1. Course Description

The course aims to introduce students to the social, cultural and technical aspects of architect. It enables students to design a fairly complex building in a natural suburb landscape. It helps students to analysis local architecture and technology and synthesis local know how to come up with design which is integrated with local context. The theme of the course is how to integrate context, culture, local material and technology, natural environment and vernacular architecture in design.

Semester Project:

Project I: Recreational Buildings like Hotels, Sport Buildings, and Recreation Centres
Project II: Cultural Buildings like Museums, Galleries, Theatre, and Cultural Centres

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Analyse vernacular architecture spatial, functional, structural and formal dispositions
2. Appreciate local social, cultural and historical know how
3. Synthesis local social, cultural and historical know how as well as vernacular spatial, functional, structural and formal dispositions in architectural design
4. Discuss the role of architecture in mediating culture, nature and ethnology.
5. Integrate a building with local context: site, environment & landscape.

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), assignments

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Flexible: Architecture that Responds to Change, Robert Kronenburg, (2007) ISBN-13: 978-1856694612

References

Towards Sustainable architecture, Edwards, Brain ISBN-13: 978-0750624923ISBN-13: 978-0750641340

Evaluation Scheme

Assignments	20%
Project I	40%
Project II	40%

20.8.6. Course Title: ARCHITECTURAL DESIGN IV (Architecture for Service & Production)

Course Number:Arch 542
Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)
Prerequisite: Arch 541

20.8.6.1. Course Description

The course aims to give students advanced analytical skills to deal with more complex architectural design problems in a comprehensive manner. The course focuses on more functional and technical buildings. The theme of the course is how to deal with functional buildings and to integrate function, technology and production processes in Architecture. Students will be exposed to more functional buildings like Hospitals, Farm and Industrial Buildings.

Course Objectives

On completion of this course students should be able to:

1. Analyse functional and structural configuration in more functional buildings, program analysis and development of requirement.
2. Discuss the role of architecture in service provision and production process.
3. Synthesis production process, technology, structure in designing production and service buildings.
4. Semester Project:
5. Project I: Public Service Buildings like Hospital, Court House, Convention, Exhibition centres
6. Project II: Production Buildings like Industrial and Farm Building

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Places of the Soul: Architecture and Environmental Design as a Healing Art by Christopher Day (Dec 1, 2003) ISBN-13: 978-0750659017

References

Congress Convention and Exhibition Facilities: Planning and Design, Fred Lawson ISBN-13: 978-0750627900

Evaluation Scheme

Assignments	20%
Project I	40%
Project II	40%

20.8.7. Course Title: URBAN DESIGN

Course Number:Arch 443
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 543

20.8.7.1. Course Description

The course aims to equip students with the basic analytical skills and knowledge of urban design and planning issues, approaches and methods. The course includes recent trends and application to new urban areas.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Plan the architecture of the city: paths, edges, urban furniture, districts, nodes and landmarks;
2. Pattern urban form: streets, monuments, squares and blocks; urban design and conservation: urban analysis, morphology.
3. Complete project work on Urban Details, Streets/Block/ Square Design.
4. Understand theories of urban form: group from, compositional form, mega structure be able to do urban analysis: morphology, typo-morphology and urban tissues.
5. Understand urban land management: problem, issues, recent trends and considerations, regional planning, space-economy theories, basic concepts and processes.
6. Design of new urban entities, new neighbourhoods using implementation techniques and design guidelines.

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century [Paperback], Wiley-Blackwell; 3 edition (July 2, 2002)
ISBN-10: 9780631232520
ISBN-13: 978-0631232520

References

City in History. Mumford, Lewis, (1968) ISBN-13: 978-0156180351

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.8.8. Course Title: URBAN PLANNING

Course Number:Arch 543
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 332

20.8.8.1. Course Description

The course aims to equip students with theoretical, methodological and practical skills to deal with complex urban design and planning problems

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Know the Basic know how of the urban planning and urban planning process.
2. Detail plans for Strategic Local Development, upgrading, redevelopment, land development, conservation, and action areas.
3. Initiating Local Development Plans using the participatory process, spatial and detail infrastructure design, plot parcellation setting design guidelines for building development.
4. Design within the existing urban fabric: urban renewal.
5. Imagine the city, paths, edges, districts, nodes and landmarks, pattern of urban form: streets, squares, moments..
6. Exercise redevelopment planning or intervention in an existing urban setting.
7. Design projects which include implementation techniques and design guidelines.

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Great Streets By Allan B. Jacobs, (1995) ISBN-13: 978-0262600231

Reference

The Urban Design Book: Techniques and Methods by Ray Gindroz ISBN-13: 978-0393731064

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.8.9. Course Title: LANDSCAPE ARCHITECTURE

Course Number:Arch 445
Credit Hour: 2 (Lect. 1Hrs, Studio 3Hrs)
Prerequisite Arch 232

20.8.9.1. Course Description

The course will help the student's to know the History of Landscape Architecture as well as make them understand the Site planning, site survey and analysis, Designing with land forms, plants, water and stone. Special organization of the outdoor environment with sculptural forms, paths, places, materials, colour, art, graphics, fixtures and furnishings, and Presentation techniques of landscape design information. Studio projects will be practiced.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Discuss the history of Landscape Architecture.
2. Understand site planning, site survey and analyse principles of landscape planning, design and development.
3. Design with land forms, plants, water and stone.
4. Make special organization of the outdoor environment with sculptural forms, paths, places, materials, colour, art, graphics, fixtures and furnishings.
5. Know presentation techniques of landscape design information.

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Detailing for Landscape Architects: Aesthetics, Function, and Constructability by Thomas R. Ryan, Edward Allen and Patrick J. Rand, Wiley; 1st Edition, February 8, 2011 ISBN-10: 0470548789, ISBN-13: 978-0470548783

References

Modern Landscape Architecture: Redefining the Garden, Jory Johnson, Felice Frankel, ISBN-13: 978-1558590236

Layout Techniques for Landscape Architecture, by Gary Austin, (1995) ASIN: B0034DIVQ0

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.8.10. Course Title: ECOLOGICAL ARCHITECTURE

Course Number:Arch 545
Credit Hour: 2 (Lect. 1Hrs, Studio 3Hrs)
Prerequisite: Arch 442

20.8.10.1. Course Description

The course focuses on the relationship between the balance of nature and the effects of human settlement. The students shall become aware of the meaning and challenge of sustainable development. They shall gain the capability of making rational decisions on the basis of fundamental knowledge and awareness of ecological issues.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Apply the principles of ecology and architecture to urban ecology using examination of materials, methods and theories in architecture through ecosystem balance.
2. Design and build with and in nature renewable resources and the Ethiopian context.

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

Reference Books:

Sustainable design, Ecology, Architecture, and plannin Daniel E. Williams, FAIA
The Ecology of Building Materials Bjørn Berge

20.8.11. Course Title: BACHELOR THESIS

Course Number:Arch 443

Credit Hour: 12(Lect. 0Hrs, Studio 12Hrs)

Prerequisite: All modules

20.8.11.1. Course Description

The thesis project is a comprehensive architectural design project, which necessitates the co-ordination of other fields in the building design process. It comprises program preparation and design of buildings containing spatial, functional and social aspect. A research paper will be produced which includes a complete construction document (drawing and written documents).

The thesis seminar is conceived to offer a special platform of support by lecturers and exchange between students during the thesis project. The theme of the course is how to do handle design projects from initial stage to final stage independently and through research with minimum guidance of instructors.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Demonstrate coherent architectural designs that integrate a knowledge of the ways that analysis, research, context, budget,
2. Understand the social, political, economic and professional context, the regulatory frameworks, and health and safety considerations that guide design and building construction
3. Apply architectural histories and theories of physical, artistic and cultural contexts, and their use in informing the design process
4. Know how to critically appraise design inputs to ensure that the design response is appropriate to site and context with consideration for sustainability and budget.
5. Know the regulatory requirements, including the needs of the disabled, health and safety legislation and building regulations and development control, that guide building construction
6. Develop an appropriate philosophical approach which reveals an understanding of theory in a cultural context and the ability to Generate and systematically test, analyse and appraise design options, and draw conclusions which display methodological and theoretical rigor.

Semester Project:

The project should be complex enough that allows application of all skill, knowledge and attitude grasped in the five years and is researchable.

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Concerned Design Book

Evaluation Scheme

Project work	70%
Presentation	30%

20.8.12. Course Title: Internship

Course None

Credit Hour: 8(Lect. 0Hrs, Studio 8Hrs)

Prerequisite: All modules

20.8.12.1. Course Description

The thesis project is a comprehensive architectural design project, which necessitates the co-ordination of other fields in the building design process. It comprises program preparation and design of buildings containing spatial, functional and social aspect. A research paper will be produced which includes a complete construction document (drawing and written documents).

The thesis seminar is conceived to offer a special platform of support by lecturers and exchange between students during the thesis project. The theme of the course is how to do handle design projects from initial stage to final stage independently and through research with minimum guidance of instructors.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Expand of knowledge and acquaintance with industry in the field of Architecture.
2. Consolidation and deepening of existing knowledge in the Architectural design and construction industry.
3. Involve in the planning, steering and management of the design & construction processes.
4. Apply training in practical skills typical for the construction industry. Typically, this would be participation –individually or within a (task) group– in real assignments/projects, which entail the application of knowledge and skills attained so far during the studies at College–and aiming at developing special skills related to the industrial practice– in one or several of the following fields (depending on the type of industry and company profile):
5. Design
6. Construction/Supervision and Management

Semester Project:

The project should be complex enough that allows application of all skill, knowledge and attitude grasped in the five years and is researchable.

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

A written report to the Internship Coordinator, signed by the student‘s host company, documenting the areas in which the student has worked and the specific knowledge obtained as a result.

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Concerned Design Book

Evaluation Scheme

Assessment by firm/body (report) 50 %

Assessment by Internship Coordinator (report) 50%

20.9. Module-5: Building Construction & Techniques

Teaching & learning methods: Lectures, Exercises, Seminars, Workshops

Evaluation methods: Exercise evaluation, written examination, Seminar evaluation

Required knowledge and capabilities

The aim of the module is to equip the students with a theoretical and practical understanding of contemporary problems in architecture related to materials, structure, construction and building technology. They shall become aware of the building as a holistic system and learn to integrate the subsystems of construction and techniques under the aspect of function, form and sustainability. The module stresses the influence of ecological and sustainable strategies on the design of "intelligent" buildings and sustainable cities. Expected capabilities are:

- Technical knowledge of structure, materials, and construction.
- Ability to act with innovative, technical competence in the use of building techniques and the understanding of their evolution.
- Understanding of the processes of technical design and the integration of structure, construction technologies and services systems into a functionally effective whole.
- Awareness of the role of technical documentation and specifications in design realization, and of the processes of construction cost planning and control.

20.9.1. Courses of the module

Table 30: Module-5: Building Construction & Techniques (Course lists)

Course names	Course no	Credit points (ECTS)
Building materials & construction I	Arch 252	8 CP
Workshop I	Arch 254	3 CP
Building materials & construction II	Arch 351	13 CP
Workshop II	Arch 355	3 CP
Theory & design of structures I	Arch 353	9 CP
Building materials & construction III	Arch 352	5 CP
Theory & design of structures II	Arch 354	10 CP
Surveying	Arch 451	3 CP

20.10. Module-5: Course Descriptions

20.10.1. Course Title: BUILDING MATERIALS & CONSTRUCTION I

Course Number:Arch 252
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: None

20.10.1.1. Course Description

This course is designed to equip the students with the theoretical and practical understanding of basic principles in architecture related to materials, structure, construction and general technology. It introduces students to common building materials that are naturally occurring and man-made while giving awareness and appreciation in the use of local materials for building construction. The composition, production and properties of different building materials will be also be discussed in length. Basic structural systems such as columns, beams, load bearing and non-load bearing structures as well as individual building components will be introduced. Under the topic of finishing works and materials (ceiling, paint, tiling...) different terms and materials used , how they are constructed, accessories involved... will be explained illustrating different methods of joining parts, sequential construction process, and tools and instruments involved. The application of construction chemicals that enhance specific performances such as water proofing, healing and sealing chemicals will also be discussed. The course concludes with discussion on the challenges and constraints when selecting different building materials.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand the origin and characteristics of common building materials, the composition and properties of building materials.
2. Know about the preparation and production of the materials commonly used in Ethiopia: Stone, earth, wood, cement, lime, mortar, and sand, concrete.
3. know basic structural elements and force systems in buildings, identify types of foundation, reasons behind structural failures
4. Know about new innovations in building materials, the need for constructing chemicals
5. Differentiate finishing works and a variety of finishing materials like paints, tiles etc.
6. Handle and use common hand tools, equipment's and materials properly

Instructional methods

Lectures, Exercises, Seminars, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Fundamentals of Building Construction: Materials and Methods by Edward Allen and Joseph Iano, Wiley; 2009 ISBN-10: 0471219037, ISBN-13: 978-0471219033

References

Materials, Structures, and Standards: All the Details Architects Need to Know But Can Never Find, (2006) Julia Mc Morrough
ISBN-13: 978-1592531936

Evaluation Scheme

Assignments and exercises	35%
Quizzes	15%
Final Examination	40%

20.10.2. Course Title: WORKSHOP I WOOD, JOINERY

Course Number:Arch 254
Credit Hour: 2(Lect. 1Hrs, Studio 3Hrs)
Prerequisite: None

20.10.2.1. Course Description

In the workshop the theoretical knowledge will be combined with the basics of craftsmanship. The students shall become familiar with the material wood and get some basic training in technical and vocational skills. In an exemplary way they will gain an understanding of construction methods and the potentials and limitations of the material as well as the direct personal experience of its tactile and optical nature. The course will be tailored to the needs of the students of architecture in an interdisciplinary way. The workshop is organized in groups of 10-15 students. The same workshop will be given several times during the 1st academic year (1. /2. Semester)

Course Objective (Outcomes)

On completion of this course students should be able to:

1. Understand specific characteristics of the material, different kinds of wood, timber
2. Perform joining techniques, treatment of surface, tools and machines

Instructional methods

Lectures, Exercises, Seminars, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

House Framing: Plan, Design and Build, Wagner 2005

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.10.3. Course Title: BUILDING MATERIALS & CONSTRUCTION II

Course Number:Arch 351
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 252

20.10.4. Course Description

This course is designed to equip students with the theoretical and practical understanding of variety of building materials and their application/ use giving emphasis on their properties and performance. In the exercise sessions detail drawings especially at connection points and drawing symbols on plans will be covered. During seminar sessions students will be guided to develop effective oral and written communication skills necessary for individual or group work reporting and presentations. As the most commonly used construction material, concrete will be discussed in detail from production to application and use. In parallel terms such as formwork and scaffolding will be discussed. Prefabrication and working with modular construction, the challenges and merits will be covered. The course will also introduce how to observe safety precautions and safe practices in construction work sites or in the use of tools and equipment to minimize accidents on site, ensure welfare of site workers, public safety. The course concludes by discussing the issue of design with climate which will cover topics such as site planning, orientation of buildings shading devices...for maximum output as a response to different climatic needs. Challenges with different climate conditions, the use of different building materials for human comfort, building performance analysis and energy efficiency for climate adopted buildings will be covered.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Know properties of common building materials , their application in construction of basic elements of buildings
2. Understand and be able to produce working drawings and special detail drawings.
3. Know about concrete from production or mix to application
4. Understand the benefits of prefabrication and modular co-ordination, resource efficiency, sustainability in design, construction and f buildings, new technologies in construction, modern scaffoldings.
5. Practice safety measures on construction sites and in the use of tools, equipment and machineries.
6. Compare the merits and demerits of materials used for buildings in different climatic conditions, understand the idea of passive design, energy efficiency and sustainable design

Instructional methods

Lectures, Exercises, Seminars, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Fundamentals of Building Construction: Materials and Methods by Edward Allen and Joseph Iano, Wiley; 2009 ISBN-10: 0471219037, ISBN-13: 978-0471219033

References

Building Design and Construction Handbook, 5th Edition. Merritt, Frederick & Ricketts, Jonathan, (2000), ISBN-13: 978-0070415966

Concrete Masonry Handbook For Architects, Engineers, Builders by James A. Farny, J. M. Melander and W. C. Panarese, Portland Cement Assn; 6 edition (March 14, 2008) ISBN-10: 0893122602, ISBN-13: 978-0893122607

Evaluation Scheme

Assignments and exercises	35%
Quizzes	15%
Final Examination	40%

20.10.5. Course Title: WORKSHOP II STONE AND BRICK, MASONRY

Course Number:Arch 355
Credit Hour: 2(Lect. 1Hrs, Studio 3Hrs)
Prerequisite: Arch 254

20.10.5.1. Course Description

In the workshop the theoretical knowledge will be combined with the basics of craftsmanship. The students shall become familiar with the materials natural stone, brick, concrete and get some basic training in technical and vocational skills. In an exemplary way they will gain an understanding of construction methods and the potentials and limitations of the material as well as the direct personal experience of its tactile and optical nature. The course will be tailored to the needs of the students of architecture in an interdisciplinary way. The workshop is organized in groups of 10-15 students. The same workshop will be given several times during the 1st academic year (1. /2.semester)

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Appreciate specific characteristics of the material, different kinds of natural stone, brick and concrete.
2. Understand the techniques of stonework, treatment of surface, tools and machines.

Instructional methods

Lectures, Exercises, Seminars, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self study, present presentations, collect and incorporate feedbacks.

Text Book

House Framing: Plan, Design and Build, Wagner 2005

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.10.6. Course Title: THEORY & DESIGN OF STRUCTURES I

Course Number:Arch 353
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: None

20.10.6.1. Course Description

This course introduces the design of structures in the context of architectural design. The students shall be able to understand the load bearing capacity of structures to understand the technical terminology to enable them to collaborate with civil engineers.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand statics: normal forces, shearing forces, bending moment and torque, diagrams of internal forces and moments.
2. Understand elasticity and strength of materials: stress and strain, compression, tension, flexure, deflection, buckling, factor of safety, strength and allowable stress of materials.

Instructional methods

Lectures, Exercises, Seminars, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

Structural Steel Design, Jack C. McCormac. (2007). . McGraw-Hill.
ISBN-13: 978-0071638371, ISBN-13: 978-0470279274

Reference

Design of concrete structures, Arthur H Nilson. (2003).. McGraw-Hill, ISBN-13: 978-0072921991
Design of Concrete Structures by Arthur Nilson, David Darwin and Charles Dolan, McGraw-Hill Science/Engineering/Math; 14 edition (July 10, 2009), ISBN-10: 0073293490, ISBN-13: 978-0073293493
Building Construction Illustrated, (2008) By Ching, Francis ISBN-13: 978-0470087817
Up, Down, Across: Elevators, Escalators and Moving Sidewalks Alisa Goetz, (2003) ISBN-13: 978-1858942131

Evaluation Scheme

Assignments and quizzes	10%
Research Paper	20%
Mid-term	30%
Final Examination	40%

20.10.7. Course Title: BUILDING MATERIALS & CONSTRUCTION III

Course Number:Arch 352
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 351

20.10.7.1. Course Description

This course is designed to equip students with the theoretical and practical understanding of basic construction materials and systems of construction related to substructure and superstructure. It explains the building system and different constructions systems and technologies. It will also give emphasis on different parts of a building such as the exterior envelope (skin of a building), interior partitions (space plan), mechanical devices and in-built fixtures and furniture and their performance requirements. In exercise sessions there will be interactive discussions and hands on practice on preparation of complete set of working drawings for simple and complex buildings.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand of basic components of a building and the different systems of construction
2. Understand function of building parts such as openings, walls...., sound and thermal insulation, moisture movement, damp-proofing and means of vertical circulation.
3. Prepare working drawings and construction details as per required standards
4. Principles of exterior envelope design for a wide variety of enclosures with an emphasis on the energy performance
5. Have an understanding of collaboration with other disciplines and giving provisions for electrical, sanitary and mechanical systems
6. Solve construction and building material related problems with alternate materials or with additional details

Instructional methods

Lectures, Exercises, Seminars, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Building Construction Illustrated, (2008) By Ching, Francis, ISBN-13: 978-0470087817

Reference Book

Up, Down, Across: Elevators, Escalators and Moving Sidewalks Alisa Goetz, (2003)
ISBN-13: 978-1858942131

Evaluation Scheme

Assignments and quizzes	10%
Research Paper	20%
Mid-term	30%
Final Examination	40%

20.10.8. Course Title: THEORY & DESIGN OF STRUCTURES II

Course Number:Arch 354
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 353

20.10.8.1. Course Description

Provide brief introduction to design of structures in the context of architectural design. Alongside the construction course the students will learn the basic elements of structural design. The optimization of architectural designs with consideration of comprehensive structural aspects shall be covered.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Analyse and design structural members: structural systems of buildings, frames, arches, shells, earthquake resistant structures load types, load deflection analysis of structures.
2. Understand foundations, soil mechanics and bearing capacity of soils, settlement, earth pressure, shallow and deep foundations, site exploration.
3. Understand concrete structures such as heavy and lightweight concrete, beams shallow and deep, flat slab, one-way and two-way slabs.
4. Understand steel structures, beams, columns and trusses, structural connections, composite structures of steel and concrete.
5. Understand timber structures, beams, columns and trusses, structural connections.
6. Have knowledge of large span structural systems such as space frames, tents, balloons, pneumatic structures, tensile structures, suspension and cable-stayed systems, honeycomb structures and modern bridges.

Instructional methods

Lectures, Exercises, Seminars, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

Structural Steel Design, Jack C. McCormac. (2007). . McGraw-Hill.
ISBN-13: 978-0071638371, ISBN-13: 978-0470279274

Reference

Design of concrete structures, Arthur H Nilson. (2003).. McGraw-Hill, ISBN-13: 978-0072921991
Design of Concrete Structures by Arthur Nilson, David Darwin and Charles Dolan, McGraw-Hill Science/Engineering/Math; 14 edition (July 10, 2009), ISBN-10: 0073293490, ISBN-13: 978-0073293493

Evaluation Scheme

Assignments and quizzes	10%
Research Paper	20%
Mid-term	30%
Final Examination	40%

20.10.9. Course Title: SURVEYING

Course Number:Arch 451
Credit Hour: 2(Lect. 1Hrs, Studio 3Hrs)
Prerequisite: None

20.10.9.1. Course Description

The course gives an introduction to the basics of surveying and enables the students to carry out simple topographic surveys. The student will also understand how field surveys are transferred to paper either through digital technology or simple manual techniques.

Course Objectives (Outcomes)

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

1. Measure distances, angles and levels.
2. Understand the theory and practice in the use of surveying instruments.
3. Complete a topographic survey of building sites: contours, cross-sections.
4. Set out of buildings and know the theory of levelling.

Instructional methods

Lectures, Exercises, Seminars, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Text Book

Surveying: Principles and Applications (8th Edition) by Barry F. Kavanagh, Prentice Hall; 8 edition (July 31, 2008), ISBN-10: 013236512X, ISBN-13: 978-0132365123

References

Basic Surveying, By Re Paul and White, (1997), ASIN: B001V7U79U

Evaluation Scheme

Project work	40%
Mid-term	20%
Final Examination	40%

20.11. Module-6: Sustainable Housing Strategies

Teaching & learning methods: Lectures, Exercises, Laboratory, Workshops
Evaluation methods: Exercise evaluation, written examination, Seminar evaluation
Required knowledge and capabilities

- Ability to act with knowledge of natural systems and built environments in the creation of housing.
- Understanding of conservation and waste management issues.
- Awareness of cost management through the effective use and understanding of natural systems and resources in the making of the human habitat.
- In-depth study to the contemporary challenges of the built environment under the Ethiopian context focusing on housing.
- Understanding of the life-cycle of materials, issues of ecological sustainability, environmental impact, design for reduced use of energy, as well as passive systems and their management.
- Strengthening the social and ecological responsibility of the students.

20.11.1. Courses of the module

Table 31: Module-6: Sustainable Housing Strategies (Course lists)

Appropriate building technology - Arch 562	**Credit points (ECTS) 6 CP**
Low-cost strategies in design Arch 661	Credit points (ECTS) 4 CP

20.12. Module-6: Course Descriptions

20.12.1. Course Title: APPROPRIATE BUILDING TECHNOLOGY

Course Number:Arch 562
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 355

20.12.1.1. Course Description

The aim of the course is to raise the student's awareness of appropriate building technologies, crafts and materials in design a sustainable building. The course is made for learning from biological and ecological system functioning and using ecological principles as a working model for sustainable design, for reviewing the challenges and argues for a deeper look into and beyond green design making the case that a critical element in the change to design a sustainable future. It basically focus on architectural design and the building structures and materials connected to their site and natural place in order to capture, store, and distribute the natural site energies, the neighbourhood scale, and local climate conditions.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Appropriate building technology: analysis, objective, target population.
2. Design and construction of earth materials, bamboo, and fibre reinforced concrete, solar energy, wind energy, waste management, water consumption and indoor environment quality etc.
3. Construct an actual model building using experimental materials.

Instructional methods

Lectures, Exercises, Laboratory, Workshops

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Architecture, technology and process by Chris Abel, (2004)
ISBN-13: 978-0750637923

References

New architecture and technology by Gyula Sebestyebe, Christopher Polington, (2003)
ISBN-13: 978-0750651646

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.12.2. Course Title: LOW-COST STRATEGIES IN DESIGN

Course Number:Arch 661
Credit Hour: 2(Lect. 1Hrs, Studio 3Hrs)
Prerequisite: Arch 482

20.12.2.1. Course Description

The aim of the course is to teach and train low- cost strategies in design. Students shall become able to adopt in their design projects tools based on international and especially Ethiopian expert knowledge. Special consideration will be given to the field of low cost housing. The course will enable the students in designing a building towards higher efficiency levels, low impacts on the site and surrounding areas, increasing durability, and enhancing the quality of life for the occupant, as well as the local community.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Emphasis Ethiopian urban/rural context cost minimization, affordability,
2. Understand the value of material selection, flexibility, user selection and effective construction technologies.

Instructional methods

Lectures, Exercises, Laboratory, Workshops

Assessment methods

Project evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Architecture Design procedure By Arthur Thompson, (1998)
ISBN-13: 978-0340719411

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

20.13. Module-7: Building Science

Teaching & learning methods: Lectures, Exercises
Evaluation methods: Exercise evaluation, written examination, Seminar evaluation
Required knowledge and capabilities

- Understanding of service systems as well as systems for transport, communication, maintenance and safety.
- Fundamental knowledge of the physical problems, which are connected with the function of a building.
- Understanding of ecological coherences and sustainability.
- The students shall be able to deal with the parameters of architectural sciences and to incorporate them into their design practice.
- They shall be able to understand the technical terminology in order to collaborate with engineers.

20.13.1. Courses of the module

Table 32: Module-7: Building Science (Course lists)

Architectural science I **- Arch 471**	**Credit points (ECTS) 3 CP**
Architectural science II **- Arch 472**	Credit points (ECTS) 3 CP
Architectural science III **- Arch 571**	Credit points (ECTS) 4 CP

20.14. Module-7: Course Descriptions

20.14.1. Course Title: ARCHITECTURAL SCIENCE I (Electrical)

Course Number: Arch 471
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: PHYS 205

20.14.1.1. Course Description

This course introduces the basics of electrical installation in the context of architectural design with an emphasis on lighting. The students shall be able to deal with the parameters of electrical wiring and to incorporate them into their design practice. They shall be able to understand the technical terminology to enable them to collaborate with the engineers.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Have a basic understanding of electrical circuits.
2. Have a basic understanding of generation and distribution systems, lighting & power demand calculation methods,
3. Design electrical installation systems and complete electrical installations for a small building.

Instructional methods

Lectures, Exercises

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Mullin, RC. 2004. Electrical Wiring Residential: Based on the 2005 National Electric Code, 15th ed. Delmar Cengage Learning, 4th Ed., 2007.

References

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

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

Home Improvement, Black and Decker, 2009

Simplified Design of Bldg. Lighting by Schiler ISBN-13: 978-0471192107

Evaluation Scheme

Homework and quizzes	20%
Mid-term	30%
Final Examination	50%

20.14.2. Course Title: ARCHITECTURAL SCIENCE II (Water, heating, cooling, ventilation)

Course Number:Arch 571
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: PHYS 205

20.14.2.1. Course Description

The course aims to introduce students to the basics of technical installation of water systems and heating, cooling and ventilation systems in the context of architectural design. Students shall learn to deal with the parameters of these systems and to incorporate them into their design practice. They shall also learn the technical terminology to enable them to collaborate with the engineers.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand water supply systems, sources, quality quantity, treatment and storage and installation of sanitary fixtures.
2. Understand drainage work above and below ground, treatment and storage, storm water drainage and collection, treatment and disposal of refuse.
3. Know the basics of active and passive heating, ventilation and cooling systems

Instructional methods

Lectures, Exercises

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Plumbing Technology: Design and Installation by Lee Smith and Michael A Joyce, Delmar Cengage Learning; 004 edition (June 27, 2007) ISBN-10: 1418050911 ISBN-13: 978-1418050917
Bathroom Basics, P. Galvin, 1997

Reference

Plumbing : Design and Installation, (2006) L. V. Ripka ISBN-13: 978-0826906311
Air Conditioning Principles and Systems, (2001) by Edward G. Pita ISBN-13: 978-0130928726
Heating, Cooling, Lighting: Design Methods for Architects, Norbert Lechner, (2008), ISBN-13: 978-0470048092

Evaluation Scheme

Homework and quizzes	20%
Mid-term	30%
Final Examination	50%

20.14.3. Course Title: ARCHITECTURAL SCIENCE III (Lighting, acoustics)

Course Number:Arch 572
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: PHYS 205

20.14.3.1. Course Description

This course introduces the basics of technical installation lights and acoustics systems in an architectural design. Students will study the important role lighting system plays in architectural design. Also, the students shall be able to deal with the parameters of acoustics incorporating them into their design practice. They shall be able to understand the technical terminology to enable them to collaborate with the other engineering professionals.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand the scientific principles of light in relation to design of buildings including natural and artificial lighting, light and glare and light in architecture.
2. Understand calculation methods for lighting building interiors.
3. Understand the acoustics principles of sound production , frequency and loudness, reflection, absorption, transmission and diffraction and hearing sensitivity,
4. Do noise reduction calculations for architectural acoustics.
5. Control noise in buildings using sound insulation and isolation, room acoustics, pattern of distribution of sound in an enclosure, sound reinforcement, auditorium space design
6. Use criteria for speech and music.

Instructional methods

Lectures, Exercises

Assessment methods

Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Architectural Lighting Design, (2008) Steffy, ISBN-13: 978-0470112496

Acoustic Design (Architectural Press Library of Design and Detailing), Duncan, Templeton, David Saunders, ISBN-13: 978-0442308469

Reference

Acoustical Design of Concert Halls and Theatres : A Personal Account Vilhelm Jordan, (1980), ISBN-13: 978-0853348535

Acoustical Designing in Architecture, V. Knudsen, C. Harris, (1980), ISBN-13: 978-0883182673

Evaluation Scheme

Homework and quizzes	20%
Mid-term	30%
Final Examination	50%

20.15. Module-8: Integrated Projects Courses

Teaching & learning methods: Horizontally coordinated design projects. Supervision of project work and design processes, external criticism, excursions

Examination methods: Jury evaluation on projects (including external jury).

Required knowledge and capabilities

The project studios are the core elements of the curriculum in the 6th till 9th semester. They continue the design studios of the previous semesters with an interdisciplinary approach under the supervision of different instructors. In this module the students get considerable studio practice and individual and team experience to resolving design problems and issues. Critically in the studio sessions the students present solutions to architectural, structural design, and planning problem. In particular they will gain the following capabilities:

- Ability to gather information, defines problems, apply analyses and critical judgment and formulate strategies for action.
- Ability to reconcile divergent factors, integrate knowledge and apply skills in the creation of a design solution.
- Ability to work alone as well as in a team for finding the variety of individual solutions
- Awareness of the history and practice of landscape architecture, urban design, as well as territorial and national planning and their relationship to local and global demography and resources.

20.15.1. Courses of the module

Table 33: Module-8: Integrated Projects (Course lists)

Course names	Course no	Credit points (ECTS)
Introductory design project	Arch 281	2 CP
Integrated design project I	Arch 482	10 CP
Integrated design project II	Arch 581	10 CP
Integrated design project III	Arch 582	12 CP
Integrated design project IV	Arch 681	12 CP

20.16. Module-8:Course Descriptions

20.16.1. Course Title: INTRODUCTORY DESIGN PROJECT

Course Number: Arch 281
Credit Hour: 2(Lect. 1Hrs, Studio 3Hrs)
Prerequisite: None

20.16.1.1. Course Description

This course focuses on the professional activities: problem analysis, methodological investigation, design of proposals critical evaluation on the basis of selected criteria, development of strategies of implementation. The course is combined with an excursion.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Distinguish between design and art; understand the general meaning of design.
2. Understand various design professions, architecture and others, their differences and similarities.
3. Understand the views of different disciplines by designing one or alternative proposals to a combination of architectural, engineering, urban, environmental and development problems.
4. Recognize the diverse fields of action and methods of the disciplines involved in the building and planning process

Instructional methods

Horizontally coordinated design projects. Supervision of project work and design processes, external criticism, excursions

Assessment methods

Jury, evaluation on projects(including external jury).

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Evaluation Scheme

Project work	40%
Presentation	30%
Final Examination	30%

20.16.2. Course Title: INTEGRATED DESIGN PROJECT I

Course Number:Arch 482
Credit Hour: 5(Lect. 2Hrs, Studio 9Hrs)
Prerequisite: Arch 281, Arch 441, Arch 443

20.16.2.1. Course Description

The aim of the course is to introduce into the interdisciplinary way of working in the field of Architecture and Civil Engineering / Construction Management. This studio design course is focused on appropriate building technology. The course is the most important element in this semester with participation of instructors of architecture, civil engineering and/or construction management. The students will be organized in groups of 5-10 participants. The appropriate projects for the course would be projects with sophisticated structural and formal configurations such as stadiums, airports, large exhibition centres.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Know the interdependence various factors of the architectural and structural design and building process
2. understand the technological dimension of architecture
3. Know the interdependence of building construction structural design and architectural design
4. design a building down to the level of building details
5. Design one or more alternative proposals to architectural problems with the focus on structure and management.
6. Become aware of the diverse fields of action and methods of these disciplines.
7. present a complex project with the appropriate digital media

Instructional methods

Horizontally coordinated design projects. Supervision of project work and design processes, external criticism, excursions

Assessment methods

Jury, evaluation on projects (including external jury)

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

References

Green Roofs: Ecological Design and Construction By Earth Pledge Foundation, ISBN-13: 978-0764321894
How Buildings Learn: What Happens after They're Built, By Stewart, (1995), ISBN-13: 978-0140139969
Architecture Now: Vol.1&Vol. 2, By Philip Jodidio, ISBN-13: 978-3822860656, ISBN-13: 978-3822837917, Architects' Data (3rd Edition) By Ernst Neufert, (2002), ISBN-13: 978-0632057719
The Death and Life of Great American Cities By Jane Jacobs, (1993), ISBN-13: 978-0679741954

Evaluation Scheme

Literature review, case studies, site analysis	30%
Intermediate jury	20%
Final jury(including external jury)	50%

Literature

Readers from the three teams

-Andrew W. Charleson, Structure as architecture

-Graham Bizley, Architecture in Detail

-R.Berry, The construction of buildings

20.16.3. Course Title: INTEGRATED DESIGN PROJECT II

Course Number:Arch 581

Credit Hour: 5(Lect. 2Hrs, Studio 9Hrs)

Prerequisite: Arch 482, Arch 354

20.16.3.1. Course Description

The studio is focused on the interdisciplinary cooperation in the field of architecture and planning with special focus on low cost housing. The course is the most important element in this semester with participation of instructors of architecture and planning. The students will be organized in groups of 5-10 participants. The appropriate projects for this course would be mass-housing projects such as condominiums, real estates, or any other residential neighbourhood design project.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand the diverse fields of action and methods of the disciplines involved in the building and planning process
2. Understand the integration of architectural design, urban planning/urban design
3. Understand the social and urban dimension of architecture, knowledge of the interdependence of architecture and urbanism
4. Understand the environmental and landscape elements of architecture
5. Design buildings in an urban scale with a dimension of environmental and landscape focus
6. Work in the field of architecture and urban planning or urban design, by designing one or alternative proposals to a combination of architectural and urban, environmental and development problems.

Instructional methods

Horizontally coordinated design projects. Supervision of project work and design processes, external criticism, excursions

Assessment methods

Jury, evaluation on projects(including external jury).

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Evaluation Scheme

Literature review, case studies, site analysis	30%
Intermediate jury	20%
Final jury(including external jury)	50%

References

Rob Worthington, Green building: An Integrated approach to construction
-Bjorn Berge, Ecology of building materials
- Sue Roaf, Eco House: a design guide
-New Urbanism Towards an Architecture of Community
-Hilderbrad Frey, Designing the City
Green Roofs: Ecological Design and Construction By Earth Pledge Foundation, ISBN-13: 978-0764321894
How Buildings Learn: What Happens after They're Built, By Stewart, (1995), ISBN-13: 978-0140139969
Architecture Now: Vol.1&Vol. 2, By Philip Jodidio, ISBN-13: 978-3822860656, ISBN-13: 978-3822837917, Architects' Data (3rd Edition) By Ernst Neufert, (2002), ISBN-13: 978-0632057719
The Death and Life of Great American Cities By Jane Jacobs, (1993), ISBN-13: 978-0679741954

20.16.4. Course Title: INTEGRATED DESIGN PROJECT III

Course Number:Arch 582
Credit Hour: 5(Lect. 2Hrs, Studio 9Hrs)
Prerequisite: Arch 581, Arch 424

20.16.4.1. Course Description

The studio is structured around a set of core requirements that cover a variety of topical issues in architecture with special emphasis on building sciences and services, techniques and materials. The studio is linked with the study of heating, ventilating and air conditioning of buildings, and appropriate construction techniques. The course is the most important element in this semester with participation of instructors from different disciplines, architect, electrical engineer, sanitary engineer, mechanical engineer, etc. The students will be organized in groups of 5-10 participants. The recommended projects for this course are high tech buildings like industrial buildings, mixed use high-rise buildings, theatre halls etc.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand the technological dimension of architecture with the focus of building sciences and services.
2. Know the interdependence various building services in architectural projects
3. Know the interdependence of building construction process and techniques with dimensions of services (HVAC),
4. Understand systems in a building and designing the non-space in architecture, design a building down to the level of building details,
5. present a complex project with the appropriate digital media

Instructional methods

Horizontally coordinated design projects. Supervision of project work and design processes, external criticism, excursions

Assessment methods

Jury, evaluation on projects (including external jury)

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Evaluation Scheme

Literature review, case studies, site analysis	30%
Intermediate jury	20%
Final jury (including external jury)	50%

Literature

Max Fordham and Partners, Edited by Randall Thomas Environmental design
-Stive V. Szokolay, introduction to architectural Science
-Mcquiston/parker/Spitler, Heating, Ventilating and air conditioning
-L. V. Ripka, Plumbing design and installation
-Light and architecture
-Steffy, Architectural lighting design
-Marshall Long, Architectural acoustics
-Derek Phillips, Daylighting

20.16.5. Course Title: INTEGRATED DESIGN PROJECT IV

Course Number:Arch 681
Credit Hour: 5(Lect. 2Hrs, Studio 9Hrs)
Prerequisite: Arch 582, Arch 545

20.16.5.1. Course description

The studio is structured around a set of core requirements that cover a variety of topical issues in architecture with special emphasis on traditional building crafts, techniques and materials. The studio is linked with the Research Unit of Cultural Heritage in Architecture and Development. The course is the most important element in this semester with participation of different instructors. The students will be organized in groups of 5-10 participants.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand the highly complex topic of designing and building within the historic environment.
2. Reflect the general and specific research they have undertaken on their search for the genius loci.

Instructional methods

Horizontally coordinated design projects. Supervision of project work and design processes, external criticism, excursions

Assessment methods

Jury, evaluation on projects (including external jury)

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Evaluation Scheme

Literature review, case studies, site analysis	30%
Intermediate jury	20%
Final jury (including external jury)	50%

20.17. Module-9: Elective Courses

Teaching & learning methods: Lectures, Seminars, exercises

Evaluation methods: Varies according to the course nature.

Required knowledge and capabilities

20.17.1. Courses of the module

Table 34: Module: 9 Elective Courses (Course lists)

Course names	Course no	Credit points (ECTS)
Interior design ,	Arch 691	6 CP
Architecture of the Future,	Arch 692	6 CP
Advanced urban design,	Arch 693	6 CP
Restoration & preservation,	Arch 694	6 CP
Advanced Landscape architecture,	Arch 695	6 CP
Advanced building structures,	Arch 696	6 CP

20.18. Module-9: Course Descriptions

20.18.1. Course Title: INTERIOR DESIGN

Course Number:Arch 691

Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)

Prerequisite: Arch 441

20.18.1.1. Course Description

The course aims to introduce students to the fundamentals of theory and practice of interior design and its relationship to other design disciplines. The course emphasizes correctness of fit among objects, spaces, and people as well as the physiological and psychological needs of those using them. With emphasis on the principles of residential design, the course includes research into and analysis of office spaces, public spaces such as retail, health care, and houses of worship, restaurants, and hotels. Students complete individually selected comprehensive design solutions that involve client analysis, programming, and the determination of interior architectural materials, furnishings, and light design. The complete design process is emphasized with research, code implications, and design specifications applied in the student documentation. Signage, way finding, and security issues are highlighted.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Do research into and analysis of office spaces, public spaces such as retail, health care, houses of worship, restaurants, and hotels.
2. Complete individually selected comprehensive design solutions that involve client analysis, programming, and the determination of interior architectural materials, furnishings, and light design.
3. Understand the complete design process is emphasized with research, code implications, and design specifications applied in the student documentation. Signage, way finding, and security issues are highlighted.

Instructional methods

Lectures, Seminars, exercises

Assessment methods

Evaluation of exercises (interior designs), written examinations

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Textbook

1. Interior Design Course: Principles, Practices, and Techniques for the Aspiring Designer, T. Tangaz, 2006
2. The Interior Designer's Portable Handbook, Guthrie, 2000

Reference

A History of Interior Design, Pile, John F., 2000

Evaluation Scheme

Research paper	30%
Mid-term	30%
Final Examination	40%

20.18.2. Course Title: ARCHITECTURE OF THE FUTURE

Course Number:Arch 692
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 542

20.18.2.1. Course Description

The course aims to introduce students to the temporal dimension of architecture and highlights architecture and the future. Students will explore the trends in demographics, economics and society and propose architectural designs that mediate these future conditions.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Understand trends in society and in Ethiopia, determine future development of architecture.
2. Explore futuristic architecture compared to contemporary architecture that responds to the challenges of time/space and landscape transformation.

Instructional methods

Lectures, Seminars, exercises

Assessment methods

Evaluation of exercises (design projects), written examinations

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Future Forms and Design For Sustainable Cities by Mike Jenks and Nicola Dempsey (Aug 22, 2005), ISBN-13: 978-0750663090

References

Frank Lloyd Wright: The Master Works, Lorkin, David, ISBN-13: 978-0847817153

Evaluation Scheme

Research paper	30%
Mid-term	30%
Final Examination	40%

20.18.3. Course Title: ADVANCED URBAN DESIGN

Course Number:Arch 693
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 443

20.18.3.1. Course Description

Focusing on the inner-city areas, students in this course will have an opportunity to model and render alternative scenarios of building height and massing changes, open space design, street wall and pedestrian environment design, according to different building typology choices, development guidelines and regulations, and/or historic preservation and affordable housing incentives that the students themselves devise. The course will explore the impacts of these scenarios on Addis Ababa's skyline, on important view corridors, and on the experience of being in the public realm. This course will be offered in close consultation with urban design and planning staff of the Addis Ababa City Administration, to explore the potential improvements and impacts of increased mixed-use and housing development in central city neighbourhoods.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Model and render alternative scenarios of building height and massing changes, open space design, street wall and pedestrian environment design, according to different building typology choices, development guidelines and regulations, and/or historic preservation and affordable housing incentives that the students themselves devise.
2. Understand the impacts of these scenarios on Addis Ababa's skyline, on important view corridors, and on the experience of being in the public realm.

Instructional methods

Lectures, Seminars, exercises

Assessment methods

Evaluation of exercises (design projects),

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

The Urban Design Handbook: Techniques and Working Methods, Urban Design Associates, 2003

Evaluation Scheme

Research paper	30%
Mid-term	30%
Final Examination	40%

20.18.4. Course Title: RESTORATION & PRESERVATION

Course Number:Arch 694
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 681

20.18.4.1. Course Description

The course aims at introducing students to the field of historic preservation, specifically focusing upon the areas of preservation and restoration of historic buildings. Through classroom instruction and laboratory experience, students gain relevant knowledge and skill in the use of theory, practice and applied learning to solve preservation issues and problems.

Course Objectives (Outcomes)

On completion of this course, students should be able to:

1. Discuss the topics of conservation, sustainability, technique, and treatment of historic structures.
2. Use historic documentation and research, history of building materials, discussion and case study development to explore political, social/historical, economic and design/restoration issues of preservation and adaptive use of buildings.

Instructional methods

Lectures, Seminars, exercises

Assessment methods

Evaluation of exercises, quizzes, written examinations

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Historic Preservation Technology: A Primer, 1st. Ed., R. Young, 2008

Evaluation Scheme

Research paper	30%
Mid-term	30%
Final Examination	40%

20.18.5. Course Title: ADVANCED LANDSCAPE ARCHITECTURE

Course Number:Arch 695
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 445

20.18.5.1. Course Description

This course will be offered in close consultation with urban design and planning staff of the Addis Ababa City Administration, to explore the potential improvements and impacts of increased mixed-use and housing development in central city neighbourhoods.

Course Objective (Outcomes)

On completion of this course students should be able to:

1. Incorporate landscaped areas into the inner-city designs.
2. Model and render alternative scenarios of building height and massing changes and open space design, street wall and pedestrian environment design, according to different building typology choices, development guidelines and regulations, and/or historic preservation and affordable housing incentives that the students themselves devise.
3. Devise landscape designs for residential and commercial area.

Instructional methods

Lectures, Seminars, exercises

Assessment methods

Evaluation of exercises, quizzes, written examinations

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

The Artful Garden: Inspiration for a Landscape Design, J. Van Sweden and T. Christopher,2011

Evaluation Scheme

Research paper	20%
Mid-term	30%
Final Examination	50%

20.18.6. Course Title: ADVANCED BUILDING STRUCTURES

Course Number:Arch 696
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 354

20.18.6.1. Course Description

The course aims at enabling students to solve building structural problems. It is design to provide students with background on various types of loading on structures.

Course Objectives (Outcomes)

1. On completion of this course students should be able to:
2. Understand design issues related to wind loads, earthquake loads and be familiar with the Ethiopian Building Code Standards for wind and earthquake loads;
3. Understand lateral load-resisting systems in building; stable arrangement of structural systems and distribution of lateral load.
4. Have a basic understanding of elastic stability theory.

Instructional methods

Lectures, Seminars, exercises

Assessment methods

Evaluation of exercises, quizzes, written examinations

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Structural Design: A Practical Guide to Architects, J. Underwood and M. Chiuini, 2007

Evaluation Scheme

Research paper	20%
Mid-term	30%
Final Examination	50%

20.19. Module-10: Support courses

Teaching & learning methods: Lectures, Seminars, Exercises
Evaluation methods: written examination, Seminar evaluation, Exercise evaluation
Required knowledge and capabilities

- Ability to apply mathematical, computer and problem solving skills.
- Ability to understand and apply technical and business skills.

20.19.1. Courses of the module

Table 35: Module-10: Support courses (Course lists)

Course names	Course no	Credit points (ECTS)
Applied Mathematics I	MATH 231	5 CP
Applied Mathematics II	MATH 232	5 CP
Applied Physics for Architecture	PHYS 205	5 CP
Introduction to Management	MAEN 222	3 CP
Leadership Skills	MAEN 441	3 CP

20.20. Module-10: Course Descriptions

20.20.1. COURSE TITLE: APPLIED MATHEMATICS - I

COURSE NUMBER: MATH 231 RESPONSIBILITY: CROSSCUTTING
CREDIT HOUR: 3(Lect. 2Hrs, Tutorial 3Hrs)
PREREQUISITE: None

20.20.1.1. Course Description

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

Course Objectives (Outcomes)

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 in mathematical analysis for solving scientific problems.

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Textbooks:

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

References:

Nathan Niles. Calculus with Analytic Geometry, 2nd ed, Prentice Hall.
Mathematical Handbook of Formulas and Tables 2nd ed. by Murray R. Spiegel and John Liu, 1999
Applied Mathematics. For the Managerial, Life and Social Sciences by S.T. Tan, 2007
Bittinger, Marvin, Calculus and its Applications, 10th Ed., 2011

Assessment/Evaluation

Assignments	20%;
Tests	40%;
Final examination	40%

20.20.2. Course Title: APPLIED MATHEMATICS – II

Course Number: Math 232 Responsibility: Crosscutting
Credit Hour: 3(Lect. 2Hrs, Tutorial 3Hrs)
Prerequisite: Math 231

20.20.2.1. Course Description

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

Course Objectives (Outcomes)

Students will understand the mathematics of calculus and differential equations, and be able to use this knowledge for analysis in science and technology.

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Textbooks

Bittinger, Marvin, Calculus and its applications, 10 th Ed., 2011

References:

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

Assessment/Evaluation

Assignment	20%
Tests	40
Final Examination	40%

20.20.3. Course Title: APPLIED PHYSICS FOR ARCHITECTURE

Course Number: Phys 205
Credit Hour: 3(Lect. 2Hrs, Lab. 3Hrs)
Prerequisite: MATH 231

20.20.3.1. Course Description

The purpose of this course is to reinforce previous learning of physics by focusing on the applied physics needed as support architectural studies. The theoretical work will be supported by a series of practical laboratory exercises. The topics covered include structure, temperature and heat, pressure and fluid flow, electricity and magnetism, sound and light.

Course Objectives (Outcomes)

After completing this course, students should be able to:

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

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Text Book

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

Reference

How Things Work the Physics of Everyday Life, L. Bloomfield, 2nd Ed., 2001, 12 copies
Physics for Scientists and Engineers, Vol. 2, Paul Tipler, 2003, 2 copies

Evaluation Scheme

Laboratory work	20%
Homework and quizzes	10%
Mid-term	30%
Final Examination	40%

20.20.4. Course Title: INTRODUCTION TO MANAGEMENT

Course Number:MAEN 222, same as MARK 222
Credit Hour: 3(Lect. 3Hrs.)
Prerequisite: None

20.20.4.1. Course Description

This course focuses on the basic concepts and principles of management, the functions of planning, organizing, staffing, directing and controlling and their relationships to key issues in management practices, such as leadership and motivation. Nature and role of supervisory management, functions of supervisor and labour relations, inspection and effective communication are also discussed. Students will work in teams to improve their business proficiency by developing a marketing plan, based on all this semester's courses, and understand the role marketing plays in business and business management.

Course Objectives (Outcomes)

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

1. develop a marketing plan
2. explain the characteristics of management
3. identify the evolution of management theories and practices
4. define management functions i.e. planning, organizing, leading and controlling
5. distinguish organization, theories of organizations and organizational structures
6. Apply the fundamentals of staffing, leadership theories and practices in the process of management.

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

Burrow, J. et al., Business Principles and Management, 2007. ISBN-10:0538444681

References

Rue Leslie W. and Byars Lloyd L. (2001).Business management: Rea-World Applications and Connections.

Schermerhorn John R. Mangment (2005) . Mangment 8 th ed. John Wily & Sons .Inc. ISBN –O-471-45476-1

Certo Samvel C. & Certo S. Trevis (2009) Modern Concepts & Skills Mangment 11 th ed. Prentice Hall . ISBN-978—0-13.

Griffin (2005) Mangment . ISBN 0-618-35459X. Houghton Mifflin Company

Understanding Business, 3rd ed. Nickels (1993)

Evaluation Scheme

Continuous Assessment (Assignments, tests, quizzes, presentations)	25%
Midterm exam	20%
Project work	25%
Final Exam	30%

20.20.5. Course Title: LEADERSHIP SKILLS

Course Code: MAEN 441
Credit Hours: 3(Lect. 3Hrs.)
Prerequisites: None

20.20.5.1. Course Description

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

Course Objectives (Outcomes)

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

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Books

Focus on Leadership: Servant Leadership for 21st Century, Ken Blanchard (30 c.)
Awakening the Leader Within: A Story of Transformation, Kevin Cashman, Jack Forem
The Purpose-Driven Life, Rick Warren, 2002 (150 c.)

Reference Books

Principle-Centered Leadership, Steven Covey, 199l. (10 c.)
Leadership Challenges, Kouzes and Posner, 4th Ed., 2008
Leadership: Courage in Action, Robert Terry, 1999.
Leadership: Theory and Practice, Northouse, 9th Ed, 2009

Evaluation Scheme

Midterm and final exams	60%
Leadership in the class	20%
Leadership Project	20%

20.21. Module-11: Crosscutting courses

Teaching & learning methods: Lectures, Seminars, Exercises
Evaluation methods: Written examination, Seminar evaluation, Exercise evaluation
Required knowledge and capabilities

- Ability to act with knowledge of society and users.
- Awareness of philosophy, politics and ethics

20.21.1. Courses of the module

Table 36: Module-11: Crosscutting courses (Course lists)

Course names	Course no	Credit points (ECTS)
Civic and Ethical Education	CEED 201	3CP
Sophomore English	FLEN 201	3CP
Professional Writing	FLEN 202	3CP
Communication, Presentation Skills	FLEN 301	3CP
Introduction to Philosophy(Logic)	PHIL 201	3CP
General Psychology	PSYC 201	3CP

20.22. Module-11: Courses Descriptions

Course Title: CIVIC AND ETHICAL EDUCATION
Course Code: CEED 201
Credit Hours: 3(Lect. 3Hrs.)
Prerequisite: None

20.22.1.1. Course Description

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

Course Objectives (Outcomes)

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

1. Explain the subject matter of civic and ethical education
2. Develop professional ethics
3. Appreciate the difference between state and government
4. Practice the principles and values of democracy
5. Understand the concept of citizen and citizenship
6. Know the concept of constitution and constitutionalism
7. Understand the principles of the Ethiopian constitution
8. Explain the basic concepts and features of human rights
9. Understand and analyze the concepts of development, the theories of development
10. Understand the development policies and strategies of Ethiopia
11. Know the concept of international relations
12. Discuss the national interest and foreign policies of Ethiopia

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Books

AAU (2005). Civic and Ethical Education, Compendium Part One. Addis Ababa: College of Social Sciences.

AAU (2005).Civic and Ethical Education, Compendium (2005) Part two. Addis Ababa: College of Social Sciences.

FDRE (1995). The constitution of Federal Democratic Republic of Ethiopia Addis Ababa

Evaluation Scheme

Continuous Assessment	
(Assignments, tests, quizzes, presentations)	25%
Midterm exam	20%
Project work	25%
Final Exam	30%

20.22.2. Course Title: SOPHOMORE ENGLISH

Course Code: FLEN 201

Credit Hours: 3(Lect. 3Hrs.)

Prerequisites: None

20.22.2.1. Course Description

A course designed to develop college-level reading and writing skills. It includes oral 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 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 work in the Language Lab, listening to lectures and taking notes, class discussion, giving short talks and responding to questions.

Course Objectives (Outcomes)

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

1. Understand and critically analyze class readings, as well as their Text Books.
2. Improve their academic vocabulary, written and spoken grammar and mechanics usage
3. Improve their overall writing skills: being able to write clearly and correctly, make points and support them with examples and explanations.
4. Write under time pressure in answering essay examination questions.
5. Understand oral academic lectures and basic English conversation.
6. Make simple reports and presentations to the class on readings, discussions and professional tasks

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

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

References

Confidence in Writing: Paragraphs and Essays, Alan Meyer
Steps to Writing Well, Jean Wyrick, 6e, 2005, ISBN10: 14130-01092 (3)
The Brief Bedfprd Reader. Kennedy, Kennedy and Aaron, 8e, 2003 (54)
75 Readings:Anthology ;by S. Buscemi, C. Smith, 2007
Reading for Results.
Listen; Listen to Learn: Lecture comprehension and Note-taking, R. Lebauer, 1988.
Prentice Hall, Writing and Grammar: Communication in Action, by Carroll, et.al, 2005

Evaluation Scheme

Tests: reading, grammar, vocabulary	20%
Writing assignments:	35%
Professional task: writing, presentation	10%
Class participation in discussion	10%
Final exam, including writing	25%

20.22.3. Course Title: PROFESSIONAL WRITING

Course Code: FLEN 202
Credit Hours: 3(Lect. 3Hrs.)
Prerequisites: FLEM 201

20.22.3.1. 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 research in students' professional fields, incorporating credible evidence through quotations, paraphrase and summary, using MLA/APA. Students will learn to distinguish between opinion, facts and inferences and to use argument and persuasion. Students will prepare various types of letters, memos, email, proposals, graphics and documents which will be needed in their future professional work. Students will work in teams on a cross-disciplinary professional task, including written and oral work.

Course Objectives (Outcomes)

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

1. Incorporate vocabulary appropriate to their field of study in their writing and speaking.
2. Write essays with a clear thesis, logical points to support the thesis, and evidence based on library and internet research.
3. Avoid plagiarism by incorporating research evidence using proper documentation.
4. Improve writing and proofreading skills through participating in peer review.
5. Write clear, concise and effective letters, reports, proposals, and other documents appropriate to their field of study, using library and internet research.
6. Speak clearly and effectively in groups, meetings and in a final oral presentation for the professional task.

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Books

Evergreen: A Guide to Writing with Readings, 8th Edition. Susan Fawcett. 2007. Cengage, ISBN10: 0618766448
Alred, Gerald J, Brusaw, Charles, Oliu, Walter; Business Writers' Handbook,2008. Bedford
Alred, Gerald J, Brusaw, Charles, Oliu, Walter; Handbook of Technical Writing, 2008, 9th ed.

References

Michael Merkel, Technical Communication, 9e, ISBN9780-312485979 Bedford St. Martins.
Tom Jehn, Jane, Writing in the Disciplines: a Supplement, 2007, ISBN10: 0312452640
Discovering Arguments, an Introduction to Critical Thinking and Writing,2e, D. Memering,2006
Locker, Kaczmarek. Guide to Business Communication: Building Critical Skills,2e, 2004.
Guffey, Mary Ellen. Business Writing, 2007. Thomson, Southwestern Publishers.
Writing and Speaking for Business, W. Baker, 2007, BYU Publishing.

Evaluation Scheme

Essays	30%
Professional writing assignments:	50 %
Professional task: writing, presentation	10%
Class participation in discussion	10%

20.22.4. Course Title: COMMUNICATION AND PRESENTATION SKILLS

Course Code: FLEN 301
Credit Hours: 3(Lect. 3Hrs.)
Prerequisites: FLEM 202

20.22.4.1. Course Description

Following previous limited instruction in making brief talks and reports, this course is designed to improve students' ability to give effective formal presentations and work in groups. Students will focus on audience and purpose, with attention to organization, providing support for their points, appropriate use of visual aids and awareness of nonverbal behaviour. They will give talks of varying length, planned and impromptu, followed by questions and feedback. Students will research and write a proposal paper relevant to their field, with proper documentation, and formally present their proposal using AV equipment. This will be good preparation for the professional task. In group assignments, students will learn to conduct effective meetings, negotiate, apply critical thinking in making decisions, deal with conflict usefully but respectfully, and use turn-taking and other English conversational conventions. Resume writing and interviewing skills will prepare them when they look for jobs.

Course Objectives (Outcomes)

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

1. Demonstrate awareness of audience, purpose, and the importance of skilled communication in the solution of business problems.
2. Negotiate differences in communication between themselves and people from other cultures and those with viewpoints disagreeing with their own.
3. Employ a variety of communication strategies;
4. Make effective presentations, oral and written, with or without an equipment.
5. Apply critical thinking and decision-making skills to business or technical tasks
6. Work effectively with other people in small groups or teams
7. Listen actively for understanding
8. Give and receive feedback which will improve their own and others' communication.

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

Public Speaking: An Audience-Centered Approach, Steven Beebe and Susan Beebe, 6 ed., 2006.
Munter, Mary and Lynn Russell, Guide to Presentations, 7th Ed, 2007.

References

Rudolph Verderber, Communicate, 9th ed, 1999, Wadsworth Publishing.
Locker, Kitty, Kaczmarek, Stephen Kyo, Building Critical Skills, 4th Ed. McGraw-Hill, 2008.
The Art of Public Speaking, and Learning Tools Suite, 8e, by Stephen Lucas, 2004
Writing and Speaking for Business, W. H. Baker, 2007, BYU Publishing.
Essentials of Business Communication, M.E. Guffey, 5e, 2007, Southwestern-Thomson.

Evaluation Scheme:

Class work: discussion, role plays, short talks	20%
Professional Task	10%
Quizzes:	20%
Final research Proposal and Presentation	25%
Group work, assignments and presentations	25%

20.22.5. Course Title: INTRODUCTION TO PHILOSOPHY(LOGIC)

Course Number:PHIL 201
Credit Hours: 3(Lect. 3Hrs.)
Prerequisite: None

20.22.5.1. Course Description

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

Course Objectives (Outcomes)

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

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

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

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

References

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

Evaluation Scheme

Attendance	5%
Class participation	5%
Tests	30%
Group assignment	10%
Final examination	50%

20.22.6. Course Title: GENERAL PSYCHOLOGY

Course Code: PSYC 201
Credit Hours: 3(Lect. 3Hrs.)
Prerequisites: None

20.22.6.1. Course Description

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

Course Objectives (Outcomes)

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

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

Instructional methods

Lectures, Seminars, Exercises

Assessment methods

Written examination, Seminar evaluation, Exercise evaluation

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.

Text Book

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

References

Weiten, Wayne, Diane Helpern. Psychology: Themes and Variations: with Concept Charts. Briefer Edition, 7th ed. Thomson-Wadsworth, 2007

Psychology: A Modular Approach to Mind and Behavior, 10e, Dennis Coon, 2006

Psychology, Stephen Davis and Joseph Pallidino, 4e, 2003

The Essential World of Psychology, Samuel Wood and Ellen Green Wood, 2002

Psychology: A Journey, Dennis Coon, 2002.

Psychology, 7th ed., John Santrock, 2005

Evaluation Scheme

Assignments	20%,
Projects, practical work	30%
Mid-semester examination	20%
Final project/examination	30%

20.23. Studio, architectural physics laboratory and workshop

20.23.1. Studio

1. Each Studios is for groups of up to students 25
2. Each Pod within a studio is for 3 students
3. Each Pod is equipped with a desktop computer with CAD software and a Sketch/Drawing table.

20.23.2. Architectural Physics laboratory

1. Equipment to study statics, dynamics, sound, electric circuits, light, fluid dynamics, heat and temperature.

20.23.3. Workshop for wood, metal and masonry

20.23.3.1. Equipment in the wood construction

1. Basic fixed workshop equipment for wood working including a table saw, band saw, jig saw, plane and drill press.
2. Portable power equipment for wood construction including a circular saw, saber saw and drill.
3. Hand tools for wood construction.

20.23.3.2. Equipment for metal construction

1. Fixed workshop equipment for metal construction including a band saw, grinder and welder.
2. Hand tools for metal construction.

20.23.3.3. Equipment for masonry construction

1. Portable power tools including a cement mixer and masonry saw
2. Hand tools for laying blocks and preparing foundations.

20.23.3.4. Equipment for Electrical wiring and plumbing

1. Test meters for electric circuits.
2. Hand tools for electricians.
3. Hand tools for plumbers (metal and plastic)

21. SUMMARY OF MAJOR CHANGES IN THE NEW CURRICULUM

21.1. Changes in courses Naming and Descriptions

Changes Made	Pervious	New	Rational
Change in Naming	A coordinated design project	Integrated design project	To give it appropriate name
Change in course description + Courses outlined	Theory of architectural practice		Criteria employed to revise the listed courses are: - Horizontal & Vertical r/ship with other courses - Relevance - Depth & Breadth of courses - Convenience for continuous assessment; Individual & Group Project work - Integration of Theory & Practice etc. **NB.** The above criteria are mainly meant for the course description; but the general revision of the curriculum had also considered the above rationales. The course outline is prepared for almost for all courses in the department, but yet there are some courses let be open due to their nature……..
	Architectural practice and management		
	Communication skills I		
	Communication skills II		
	Communication skills III		
	Communication skills IV		
	Communication skills V		
	3D Modelling Workshop		
	Basic Design I		
	Basic Design II		
	Architectural design I		
	Architectural design II		
	Architectural design III		
	Architectural design IV		
	Urban Design		
	Urban Planning		
	Landscape architecture		
	Ecological Architecture		
	Bachelor Thesis		
	Building materials & construction I		
	Building materials & construction II		
	Building materials & construction III		
	Appropriate building technology		
	Low-cost strategies in design		
	Architectural Science I (Electrical)		
	Architectural Science II (Water, heating, cooling & ventilation)		
	Architectural Science III (Lighting, acoustics)		
	Introductory design project		
	Integrated design project I,II,III,IV		
	Interior design		
	Architecture of the Future		
	Advanced urban design		
	Restoration & preservation		
	Advanced Landscape architecture		
	Advanced building structures		

21.2. Changes Made in course breakdown

1. Introductory Design Project course location moved from 1st Year 1st Semester to 3rd Year 1st Semester because it is a project based and a design course that prepare students to advanced design courses that should be taken after students have some drawing skill and design knowledge of different disciplines.
2. Basic Design I course location is changed from 1st Year 2nd Semester to 1st Year 1st Semester because it is a course that equips students with basic design skills and knowledge that is a prerequisite for coming design courses in second year.
3. Basic Design II course location is changed from 2nd Year 1st Semester to 1st Year 2nd Semester because it is a course that equips students with basic design skills and knowledge that is a prerequisite for coming design courses in second year.
4. FLEN 301-Communication, Presentation Skills course credit hour is changed from 3 to 2 because it is a supportive course and the course load can be covered by 2 credit hours.
5. Architectural Design II course location is changed from 3rd Year 2nd Semester to 2nd Year 2nd Semester to give students enough skill and knowledge before they start taking coordinated design courses.
6. Urban Planning course location is changed from 4th Year 1st Semester to 2nd year 2nd Semester as it is a prerequisite for coming coordinated design courses.
7. Architectural Design III course location is changed from 4th Year 1st Semester to 3rd Year 1st Semester to give students enough skill and knowledge before they start taking coordinated design courses.
8. Architectural Design IV course location is changed from 4th Year 2nd Semester to 3rd Year 2nd Semester to give students enough skill and knowledge before they start taking coordinated design courses.
9. General Psychology course location changed from 4th Year 2nd Semester to 3rd Year 2nd Semester and credit hour from 3 to 2 because it is a common course that can be covered with 2 credit hour load and better to take it before taking advanced design, construction and planning courses.
10. Theory of Architecture I and Theory of Architecture II courses location changed from 3rd Year 2nd Semester to 4th Year 1st Semester and 4th Year 1st Semester to 4th Year 2nd Semester consecutively because they are advanced courses that should be taken in advanced years.
11. Landscape Architecture course location is changed from 3rd Year 2nd Semester to 4th Year 1st Semester because it is an advanced course that should be taken in advanced year.
12. Interior Design course is changed from Elective course to Major course because nowadays interior design needed in the market.
13. Advanced Urban Design and Advanced Landscape design courses location changed from 5th Year 1st Semester to 5th Year 2nd Semester because they are advanced courses.

22. APPENDIX

22.1. Course outlies for Major & Elective courses

22.1.1. Module 3 Communication Course Content

Course Title: COMMUNICATION SKILLS I (Introduction to Engineering Drawing & Visualization)
Course Number: Arch 231
Credit Hour: 3(Lect. 1Hr, Studio 6Hrs)
Prerequisite: None

Course Description

This course basically focus on drafting principles & techniques, applied descriptive & solid geometry; the development of skills in orthographic projection & reproduction techniques, and Architectural lettering techniques. It includes: Free hand sketching of simple geometric objects, Introduction to different sketching media, Introduction to drafting techniques, Use and care of instruments, Scale and scale conversion, Simple geometric constructions, orthographic Projection, Descriptive geometry, lines, surfaces intersections of planes, intersections of solids and developments.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Become familiar with different sketching media and architectural lettering techniques.
2. Do free hand sketching of simple geometric objects.
3. Develop the understanding of drawing including the use and care of instruments, scale and scale conversion,
4. Construct simple geometric objects and orthographic representations of simple objects
5. Apply principles of descriptive geometry and pattern development to describe geometrical properties of geometric elements.

1. Introduction
1.1. Definition
1.2. History of communication
1.3. Types of Communication
1.3.1. Telepathic
1.3.2. Verbal
1.3.3. Physical
1.3.4. Modeling
1.3.5. Graphic
1.4. Types of graphic communication
1.4.1. Technical Drawing
1.4.2. Artistic Drawing
2. Basic Drawing Instruments & their Applications.
2.1. Drawing Instruments & Materials
2.1.1. Drawing Board
2.1.2. Drawing paper
2.1.3. Drawing pencils
2.1.4. Pencil sharpeners
2.1.5. Erasers,

2.1.6. Protractor
2.1.7. T-square
2.1.8. Setsquare
2.1.9. Compass
2.1.10. Divider
2.1.11. French Curves
2.1.12. Templates
2.1.13. Scale
2.1.14 Architectural lettering techniques
3. Fundamentals of lines
3.1 Alphabets of lines
3.2 Characteristic of lines
3.3 Priority of lines
4. Geometric Construction and freehand sketching
4.1. Introduction
4.2. Points
4.3. Plotting points
4.4. Lines
4.5. Lines (Parallelism, Perpendicularity, Division of lines in to segments)
4.6. Angles
4.7. Drawing polygons (Triangles, Square, pentagon…)
4.8. Circles and Tangents
4.9. Construction of an Ellipse
5. Orthographic Projection
5.1. Introduction
5.2. Types of Projection
5.3. Plane of projection
5.4. Multi- view drawing
5.5. The six principal views
5.6. Types of surfaces
5.7. Methods of arranging views
5.8. Rules of arranging views
5.9. Orientation of objects
5.10. Precedence of lines
5.11. Visualization
6. Sectional views
6.1. Introduction
6.2. Use of sectional views
6.3. Cutting plane
6.4. Section lining
65. Types of sectional views
7. Descriptive Geometry
7.4. Projecting point
7.4.1. 2D-points
7.4.2. 3D-pints
7.5. Lines

7.5.1. Definition
7.5.2. Types of lines
7.5.3. Norma line
7.5.4. Inclined line
7.5.5. Skew line
7.6. Projecting lines
7.6.1. True length of lines
7.6.2. Point view of lines
7.6.3. Bearing & slope of lines
7.6.4. Visibility of lines
7.7. Planes
7.7.2. Types of Planes
7.7.3. Norma Plane
7.7.4. Inclined Plane
7.7.5. Skew Plane
7.8. Projecting Planes
7.8.1. Edge view of plane
7.8.2. True shape of a Plane
7.8.3. Bearing & slope of a Plane
7.8.4. Locating point on a Plane
7.8.5. Locating a line on a Plane
8. Angularity Relationships
8.1. Perpendicularity
8.1.1. B/n line & point
8.1.2. B/n lines
8.1.3. B/n lines & plane
8.1.4. B/n planes
8.2. Parallelism
8.2.1. B/n line & point
8.2.2. B/n lines
8.2.3. B/n lines & plane
8.2.4. B/n planes
8.3. Intersection
8.3.1. B/n line & point
8.3.2. B/n lines
8.3.3. B/n lines & plane
8.3.4. B/n planes
8.3.5. B/n solids
9. Development
9.1 Principle of development
9.2 Parallel line developments
9.2.1 Development of prisms
9.2.2 Development of cylinders
9.3 Radial line developments
9.3.1 Development of cones
9.3.2 Development of pyramids

22.1.1.1. Course Title: COMMUNICATION SKILLS I (Sketching Parts)

The part focuses on Free hand sketching of simple geometric objects. Introduction to different sketching media,

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Do free hand sketching of simple geometric objects.
2. Become familiar with different sketching media.

Course out line

week Title Description Assignments & Exercises

1 Introduction
- Pencil
- Sketchbooks
- Paper General description of the course material and the overall expectation of the course outcome. Reading assignment

2 Lecture
- Point
- Line
- Volume The students will be able to identify the relationship between these elements and also understand the significance of points, line and volumes stretch far beyond the course communication skills into basic design thus preparing them for architectural mentality Three A4 paper sized sketches of match stick men

3 Lecture
- Meanings of lines
- Type of lines (contour lines, gustier lines…)
- Stroke
- Value
- Texture
- Shade &shadow Students will be able to understand the range of different shade values. • Exercise different types of lines weight of lines and strokes and value

4 Lecture
- Paper The application of landscape and profile format. Here will be used different examples and exercise in class room. On A4 size paper the shade value of monochrome

5 Lecture
- Scale and proportion The basic definition of scale and proportion will be studied along with their use and application.

Class work exercise that in cooperates paper usage, scale and proportion.

6 Lecture
- Volumes
- Forms Lectures on the transformation of planes to volumes by the use of shade and shadow Two A4 sized sketches of a 2D form shaded to look like 3D volume.

7 Lecture
- Shapes
- Basic forms Lectures on the differences and similarities between shapes and forms and also definition of basic forms. Two A4 sized sketches of shapes.

8 Lecture
- Techniques of shadig Basic formsLectures on how to handle pencils, angle of pencil and how to hold a pencil A4 sized sketch of basic forms

Class work exercise sessions

9 Basic forms Students will exercises sketching different basic forms based on the lectures given A3

10 Complex basic forms Students will sketch a bit more complicated basic forms that are derived from the previous simpler basic forms A3

11 Lecture + Exercise

• Transformation of basic forms This session will provide how simple basic forms give rise to complicated and intricate forms A3 sized still life (e.g. jebena) sketch showing development of form from a basic form

12. Portrait These session will show the students clearly how basic forms could develop into meaningful figures A3 sized sketch of portrait

13 Portrait (continued…)

14 Model Students will be able to convert the lectures given to them about scale, proportion, paper, strokes and transformation on a sketch of full scaled model of a person. A3 sized sketch of a model

15 Model (continued …)

16 Submission of sketch book

Instructional methods

Lectures, Exercises, individual drawing under supervision and tutorial

Evaluation methods

Exercise evaluation, continuous assessment

Role of instructor

Offer lectures, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self study, present presentations, collect and incorporate feedbacks.

Textbook

Architectural Graphics, 5th Ed., F. Ching, 2009

Reference

1. Drawing and Perceiving: Real-World Drawing for Students of Architecture and Design by Douglas Cooper (Jan 29, 2007), Wiley; 4 edition (January 29, 2007)

2. ISBN-10: 9780470047163, ISBN-13: 978-0470047163

3. FreeHand Sketching: An Introduction By Paul Laseau, W. W. Norton & Company (2004) , ISBN-13: 978-0393731125

4. Technical Sketching with an Introduction to AutoCAD (4th Edition) by Dale H. Besterfield and Robert E. O'Hagan, Prentice Hall; 4 edition (August 27, 2006), ISBN-10: 0132432781, ISBN-13: 978-0132432788

Evaluation Scheme

Sketchbook	9.9%
Exercises and assignments	19.8%
Final Examination	3.3%

22.1.2. Course Title: COMMUNICATION SKILLS II (Graphic Visualization & Representation Techniques)

Course Number: Arch 232

Credit Hour: 4 (Lect. 2Hrs, Studio 6Hrs)

Prerequisite: Arch 231

Course Description

This course focuses on the use of various graphic visualization & representation techniques such as: perspectives and parallel projection techniques in the conception & communication of space & design and to describe and stimulate the spirit of our physical environment using both freehand hand sketching and instrumental drawing in 2D and 3D ways of representations. It includes: Watercolor, ink and wash, rendering techniques of presentation drawings, photographic techniques printing, developing, and photomontage, advanced perspective drawings. Emphasizes on free hand sketching of complex compositions precisely, Architectural graphic standards and symbols; preparation of architectural floor plans, elevations and site plans, axonometric (Isometric) & Oblique representations, perspective projections simple objects and architectural building. Rendering techniques of presentation drawings, Shade and shadow & reflection of simple objects will be discussed in details. The course extends student application of design principles and elements by covering the development of 2D and 3D graphic communication techniques in creating preliminary and final presentations to convey design concepts and solutions using perspective drawings, axonometric, 3D models, freehand sketching and rendered drawings using pen and ink and color media.

Course Objectives (Outcomes)

The course aims to enable students to:

1. Do free hand sketching of complex objects and architectural drawings.
2. Use watercolor, ink and wash and rendering techniques of presentation drawings, photographic techniques printing, developing, photomontage, and advanced rendering techniques.
3. Become familiar with the various parallel projections (Axonometric and Oblique) and perspective (one and two point) projections techniques.
4. Develop the understanding and skill of representing our physical environment.
5. Produce architectural floor plans and elevations as well as the site plans.
6. Apply rendering, shade and shadow principles to produce simple presentation drawing.
7. Develop their observational skills; improve artistic expressions, formal synthesis and recording spatial images (landscapes) through both instrumental and freehand sketching.

1. Pictorial drawing
1.1. Over-view of theory of projection
1.2. Types of pictorial drawing
1.3. Isometric drawings
1.4. Oblique drawings
1.5. Perspective Drawings
2. Freehand sketching of pictorial drawings
1.1. Over-view of freehand sketching
1.2. Freehand sketching of Isometric views
1.3. Freehand sketching of Oblique views
1.4. Freehand sketching of perspective views
1.5. Rendering techniques presentation Drawing
1.6. Shade and shadow values
1.7. Figure-ground relationships
3. Architectural graphic and presentations .
3.1. Architectural symbols
3.2. Types of Architectural drawing
3.3. Architectural Scale and proportions
3.4. Architectural presentations of floor plans, Elevations, Sections and Site plan
3.5. Water color, ink and wash, rendering techniques of presentation drawings,
3.6. Photographic techniques printing, developing, and photomontage

22.1.2.1. Course Title: COMMUNICATION SKILLS II (Sketching parts)

Course Description

The course focuses on Free hand sketching of complex compositions, Precision drafting, Architectural graphic standards and symbol and Shade and shadow, reflection. In the course the capabilities in the presentation of architecture with digital methods will be trained and compared with the means of expression of the traditional media. The course part aims to enable students to develop their observational skills, improve artistic expressions, formal synthesis and recording spatial images through sketching.

Course outline

week	Title	Description	Assignments & Exercises
1	Introduction	General description of the course material and the overall expectation of the course outcome.	Reading assignment
2	Lecture	Composition	
•	Paper composition	Over view of what is meant by composition.	Exercise on A3 sized paper how to relate basic forms with paper
3	Lecture	Composition	
•	Object composition	Over view of how to compose different basic forms from different angles . (middle, from sides …)	Exercise on A3 sized paper how to compose basic forms
4	Composition of basic forms(continued …)	Exercise in class room.	A3
5	Composition of basic forms (continued …)	Exercise in class room.	A3
6	Lecture		
•	Complex composition	How do we derive complex composition from simple ones	Examples and exercises on A3
7	Lectures		
•	Complex composition	How do we derive complex composition from simple ones	A3
8	Complex composition (continued…)		
9	Rendering techniques		
•	Line rendering on basic forms	Students will apply the line rendering technique according to line weight and scale	A3 (class work)
10	Rendering technique		
•	Dot rendering technique on simple building	Students will apply the dot rendering technique	A3 (class work)
11	Rendering technique		
•	Ink rendering technique on simple building	Students will apply the ink rendering technique	A3 (class work)
12.	Rendering technique		
•	Ink scratching rendering technique on simple building	Students will apply the ink scratching rendering technique	A3 (class work)
13	Rendering techniques		
•	Shade & shadow	Students will apply the shade and shadow rendering technique	A3 (class work)
14	Lecture		
•	Reflection	What is meant by reflection? Students will understand the basic concept of reflection and its use	A3 (class work)
15	Final project based on rendering techniques on a given building by applying the techniques on to the perspective. Students will have to come up with outstanding levels of composition and rendering technique of the instructor's choosing		
□	Building and rendering technique will be provided by the teacher for individual students		A2 (class work)
16	Finalization and submission of project		A2 (class work)

Instructional methods

Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial

Evaluation methods

Exercise evaluation, Seminar evaluation

Role of instructor

Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes and lab sessions, prepare lab reports, do assignments, self study, present presentations, collect and incorporate feedbacks.

Textbook

Drafting and Design for Architecture, D. Helper, P. Wallach, and D. Hepler, 2006

Evaluation Scheme

Project work	20%
Continuous assessment	25%
Attendance	5%

22.1.3. Course Title: COMMUNICATION SKILLS III (Architectural Presentation Techniques)

Course Number:Arch 331

Credit Hour: 4(Lect. 2Hrs, Studio 6Hrs)

Prerequisite: Arch 232

Course Description

The use of mixed media, photographic representation processes & model-making techniques, coupled with the principles & strategies behind various packaging techniques for architectural presentations is the fundamental emphasis of this course. It includes a brief description on History of Computers, hardware, software and detailed discussion of the use of basic 2D AutoCAD & Arch-CAD drafting tools and other graphic software such as Rivet etc... The application of advanced rendering techniques, landscape scheme, shade and shadow & reflection skills in the preparation architectural presentation drawing of floor plans, elevations and site plans in details using both freehand drawing or instruments and appropriate computer based graphic software will be the core focus. This course is designed to extend students' skills on an intensive hand-drafting, freehand sketching, and hand-rendering course and to allow students to translate their hand-drafting, sketching and rendering skills into a design pedagogy rooted in computer-aided drafting and design software. Students will learn not only how to transfer hand-drafting projects into CAD software, but also, more importantly, how to represent large residential and small commercial spaces using a combination of sketching, hand-drafting, computer-aided drafting, and computer-aided and hand-rendering.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Do free hand sketching of buildings and landscape.
2. Become familiar with the various graphic software packages and the rendering techniques.
3. Develop the skill of using the various packages to prepare architectural presentations.
4. Prepare presentation drawing of architectural floor plans and elevations and the site plans.
5. Select and apply appropriate software in the preparation of 2D presentation drawing.
6. Develop the skill to produce improved artistic expressions, formal synthesis and recording 2D spatial images through the use of instruments and computer

1. Getting Started with AutoCAD
1.1. Starting the Software
1.2. User Interface
1.3. Working with Commands
1.4. Cartesian Workspace
1.5. Opening an Existing Drawing File
1.6. Viewing Your Drawing
1.7. Saving Your Work
2. Basic Drawing & Editing Commands
2.1. Drawing Lines
2.2. Erasing Objects
2.3. Drawing Lines with Polar Tracking
2.4. Drawing Rectangles
2.5. Drawing Circles
2.6. Undo and Redo Actions
3. Projects- Creating a Simple Drawing
3.1. Create a Simple Drawing
3.2. Create Simple Shapes
4. Drawing Precision in AutoCAD

4.1. Using Running Object Snaps
4.2. Using Object Snap Overrides
4.3. Polar Tracking at Angles
4.4. Object Snap Tracking
4.5. Drawing with Snap and Grid (Optional)
5. Making Changes in Your Drawing
5.1. Selecting Objects for Editing
5.2. Moving Objects
5.3. Copying Objects
5.4. Rotating Objects
5.5. Scaling Objects
5.6. Mirroring Objects
5.7. Editing with Grips
6. Advanced Object Type
6.1. Drawing Arcs
6.2. Drawing Polylines
6.3. Editing Polylines
6.4. Drawing Polygons
6.5. Drawing Ellipses
7. Projects- Making Your Drawings More Precise
7.1. Schematic Project: Zone and Bubble Diagram
7.2. Mechanical Project
7.3. Architectural Project: Landscape
8. Organizing your Drawing with Layers
8.1. Creating New Drawings with Templates
8.2. What are Layers?
8.3. Layer States
8.4. Changing an Object's Layer
9. Getting Information from Your Drawing
9.1. Working with object Properties
9.2. Measuring Objects
10. Projects - Drawing Organization & Information
10.1. Architectural Project
10.2. Mechanical Project
11. Advanced Editing Commands
11.1. Trimming and Extending Objects
11.2. Sketching Objects
11.3. Creating Fillets and Chamfers
11.4. Offsetting Objects
11.5. Creating Arrays of Objects
12. Inserting Blocks
12.1. What are Blocks?
12.2. Inserting Blocks
12.3. Working with Dynamic Blocks
12.4. Inserting Blocks with Design center
12.5. Inserting Blocks with Content Explorer
13. Projects- Creating More Complex Objects
13.1. Architectural Project 1- Floor Plans
13.2. Architectural Project 2- Elevations
13.3. Architectural Project 2- Sections
13.4. Architectural Project 2- Site Plans and landscapes
14. 14. Setting up a Layout
14.1. Printing Concepts
14.2. Working in Layouts
14.3. Copying Layouts

14.4. Creating Viewports
14.5. Guidelines for Layouts
15. Printing the Drawing
15.1. Printing Layouts
15.2. Printing from the Model Tab
16. Projects- Preparing to Print
16.1. Architectural Projects
17. Text
17.1. Working with Annotations
17.2. Adding Text in a Drawing
17.3. Modifying Multiline Text
17.4. Formatting Multiline Text
17.5. Adding Notes with Leaders to Your Drawing
17.6. Creating Tables
17.7. Modifying Tables
18. Hatching
18.1. Hatching
18.2. Editing Hatches
19. Adding Dimensions
19.1. Dimensioning Concepts
19.2. Adding Linear Dimensions
19.3. Adding Radial & Angular Dimensions
19.4. Editing Dimensions
20. Beginning ArchiCAD
20.1. The ArchiCAD Interface
20.2. Creating a Model
20.3. Creating Views
20.4. Working with the ArchiCAD Tools
20.5. Dimensioning and Annotation
20.6. Floors
20.7. Roofs
20.8. Structural Items (Grids, Columns, Beams)
20.9. Ceilings and Interiors
20.10. Stairs, Ramps, and Railings
20.11. Schedules and Tags
20.12. Creating Specific Views and Match Lines
20.13. Creating Sheets and Printing
21. Intermediate ArchiCAD
21.1. Creating Rooms and Area Plans
21.2. Detailing
21.3. Advanced Wall Topics / Custom Profiles
21.4. Solid Element Operation Techniques
21.5. Creating GDL Objects
21.6. Site and Topography
21.7. Building Materials & Surfaces
22. Advanced ArchiCAD
22.1. Rendering and Presentation
22.2. Importing and Coordinating ArchiCAD Models, Import / Export
22.3. Phasing and Design Options
22.4. CAD Image Tools Overview

22.1.4. **Course Title: COMMUNICATION SKILLS III(Sketching Parts)**

Course Description

The course focuses on brief History of Computers, hardware, software. Introduction to
word processing and Internet. Basic 2D AutoCAD drafting: Draw, Limits, Edit, Block, Dimension, and Text. Advanced 2D AutoCAD drafting: Advanced editing, Dimension, Text, Plot, External Reference, Paper space, customization.
3D AutoCAD drafting: Isometric drawings, simple 3D models, controlling the UCS in 3D, creating surface models. Rendering in 3D: material, light, shading, and perspectives.
Course outline

week	Title	Description	Assignments & Exercises
1	Introduction	General description of the course material and the overall expectation of the course outcome.	Reading assignment
2	Lecture		
•	Basic forms revision of what it was meant by basic forms		Exercise on A3 sized paper
3	Transformation of basic forms into complicated forms	Students will be challenged to produce different creative transformations of basic forms into complex forms	Exercise on A3
4	Transformation of basic forms into complicated forms (contin…)	Students will be challenged to produce different creative transformations of basic forms into complex forms	Exercise on A3
5	Lecture		
•	Background		
•	Foreground		
•	Middle ground	Students will differentiate the definations and applications of listed elements.	Examples and exercises on A5 going outside and sketching random movements
6	Background		
•	Foreground		
•	Middle ground (cont...)		A5
7	Lecture		
•	General elements of landscape		
•	Building sections	Students will compose building sections with their environments	Examples and exercises on A3
8	Building sections (continue…)	Students will compose building sections with their environments	Examples and exercises on A3
9	Trees	Students will use trees with context	Examples and exercises on A3
10	Trees (continue…)		Examples and exercises on A3
11	Water features (transparent objects, bottle, windows, plastics)	Students will use different hatching and shading systems to sketch such features	Examples and exercises on A3
12	Water features (transparent objects, bottle, windows, plastics)		Examples and exercises on A3
13	Hard and soft landscape	Sketching of ground covers in the environment and composing it with different features	exercises on A3
14	Hard and soft landscape		exercises on A3
15	Landscape environment (final project)	Composing the above elements to create a full landscape	exercises on A2
16	Submission of landscape environment (final project)		exercises on A2

Instructional methods
Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial
Evaluation methods
Exercise evaluation, Seminar evaluation
Role of instructor
Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Attend classes, do assignments, self-study, present presentations, collect and incorporate feedbacks.
Textbook
Architectural Drawing and Light Construction, E. Muller, P. Grau, J. Fausett, 2005
References
AutoCAD Architecture Fundamentals, 2008
Architecture, Design, Engineering and Drawing, Spence, William, 1991

Evaluation Scheme

Project work	20%
Exercises and assignments	25%
Attendance	5%

22.1.5. Course Title: COMMUNICATION SKILLS IV (Introduction to Computer-Aided Design & Digital Visualization)

Course Number:Arch 332

Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)

Prerequisite: Arch 331

Course Description

This course focuses on the advanced use of various computer software & digital media as tools for architectural presentation & design. It includes: the use of 3D AutoCAD drafting; isometric drawings, simple 3D models, creating surface models, rendering in 3D: material, light, shading, and perspectives, and data exchange with other applications. The applications of various commercial graphic packages such as: 3D-Max, Adobe Photoshop, Illustrator and Page maker, Artilants, and Sketch up in preparation of architectural presentation drawing will be the core focus of the course. This graphics skill is designed to extend students' skills from, an intensive hand-drafting, freehand sketching, and hand-rendering course to an intensive computer-aided drafting and design software which will allow students to translate their hand-drafting, sketching and rendering skills into a design approaches rooted in computer-aided drafting and design software. Students will learn more importantly, how to design, compose and visualize various architectural spaces using a combination of sketching, hand-drafting, and the various computer-aided drafting and rendering techniques.

Course Objectives

On completion of this course students should be able to:

1. Do advanced 3D modeling of built environment and landscapes in the various packages environments.
2. Become equipped with the various graphic software packages and the rendering techniques.
3. Develop the creative skill of using the various packages to prepare architectural presentations.
4. Prepare advanced presentation drawing of architectural spaces.
5. Select and apply appropriate software in the preparation of 2D and 3D presentation drawing.
6. Develop the high level skill to produce improved artistic expressions, formal synthesis and recording of 2D and 3D spatial images through the use of the various computer aided approaches.

1. Auto CAD 3D Modelling studio
1.1. 3D Foundations
1.1.1. Introduction to the 3D Modeling Workspace
1.1.2. Basic 3D Viewing Tools and 3D Navigation Tools
1.1.3. Introduction to the User Coordinate System
1.2. Simple Solids
1.2.1. Working with Solid Primitives
1.2.2. Solid Primitive Types
1.2.3. Working with Composite Solids
1.2.4. Working with Mesh Models
1.3. Creating Solids & Surfaces from 2D Objects
1.3.1. Complex 3D Geometry
1.3.2. Extruded Solids and Surfaces
1.3.3. Swept Solids and Surfaces
1.3.4. Revolved Solids and Surfaces
1.3.5. Lofted Solids and Surfaces
1.4. Modifying in 3D Space
1.4.1. 3D Gizmo Tools and Aligning Objects in 3D Space
1.4.2. 3D Modify Commands

1.5. Advanced Solid Editing
1.5.1. Editing Components of Solids
1.5.2. Editing Faces of Solids
1.5.3. Fillets and Chamfers on Solids
1.6. Additional Editing Tools
1.6.1. Creating a Shell
1.6.2. Imprinting Edges of Solids
1.6.3. Slicing a Solid along a Plane
1.6.4. Interference Checking
1.6.5. Converting Objects to Surfaces
1.6.6. Converting Objects to Solids
1.7. Refining the View
1.7.1. Working with Sections
1.7.2. Working with Cameras
1.7.3. Managing Views in 3D
1.7.4. Animating with Show Motion
1.7.5. Creating Show Motion Shots
1.7.6. Creating Animations
1.8. Visualization
1.8.1. Creating Visual Styles and Working with Materials
1.8.2. Specifying Light Sources
1.8.3. Rendering Concepts
1.9. Working Drawings from 3D Models
1.9.1. Creating Multiple Viewports
1.9.2. 2D Views from 3D Solids
1.9.3. 3D Model Import
1.9.4. Automatic Model Documentation
1.10. Working with the User Coordinate System
1.10.1. UCS Basics
1.10.2. UCS X, Y, and Z Commands
1.10.3. UCS Multifunctional Grips
1.10.4. Saving a UCS by Name
1.11. Architectural Modeling Projects: 3D perspective views and animations of a building.
2. Advanced ArchiCAD Modeling studio
2.1. Wall end / Openings' marker / Stairs Tools (Free Stair)
2.2. The Zone Tool / Fillings / Lines.
2.3. Dimensions / Layers / Detail Tool / Section Elevation Tool / the Label Tool.
2.4. Creating Library Parts / Solid Elements
2.5. Align View / Virtual Reality.
2.6. Extra Tips / ArchiCAD Solutions Extra Menu & Others Menu Commands / Publishing / Plot Maker
2.7. Customizing the Mesh Parameters
2.8. Creating a Mesh from External 2D Drawings
2.9. Creating a Plato Slab on the Terrain
2.10. Adding a Sloping Road to the Project
2.11. Creating Basic Shapes – Using Solid Element Operations
2.11.1. Creating the 3D Form of a Church
2.11.2. Adding the Choir and Aisles
2.11.3. Creating a Bell Tower
2.11.4. Completing the 3D Form of the Church
2.12. Architectural Modeling: Columns, Beams and Complex Profiles
2.12.1. Modifying the Attributes of the Columns
2.12.2. Placing Circular Slanted Columns
2.12.3. Creating New Complex Profiles for Construction Elements
2.12.4. Placing a Profiled Column

2.12.5. Creating an Inclined Beam and Defining the Intersection Priority of Beams and Columns
2.12.6. Defining Holes in the Beam
2.12.7. Adding an ArchiCAD Object to the Structure
2.13. Architectural Modeling: Walls – Slanted Walls /Composite Walls
2.13.1. Creating and Editing Straight and Slanted Walls
2.14. working with pens, layers, fills, textures, and objects
2.15. Create stories
2.16. Create building modeling
2.17. Create Presentation rendering
2.18. Create animation creation
2.19. Edit on a 3-D model of a building
2.20. Generate architectural plans, sections, elevations
2.21. Create rendered perspectives
2.22. Create "fly through" animations
3. Artilants rendering and virtual reality presentation
3.1. Exporting data from ArchiCAD
3.2. Managing revisions to the model
3.3. Managing the addition of data to the model
3.4. The Art*Lantis interface
3.5. Managing cameras and views
3.6. Managing lighting
3.7. Managing 'effects'
3.8. Creation of still images, VR scenes and VR objects
4. Sketch Up and Digital Photography
4.1. Getting started with Google Sketch Up
4.2. Architectural Modeling in Sketch Up
4.3. Site Modeling in Sketch Up
5. 3D-max Modelling studio
5.1. 3D Max Design Interface
5.1.1. Menus and Toolbars
5.1.2. Status Bar
5.1.3. The Command Panel
5.1.4. Setting the Project Folder and Configuring User Paths
5.1.5. Viewport Configuration and Navigation
5.1.6. Object Selection
5.2. Basic Functions
5.2.1. Modeling with Primitives
5.2.2. Applying Transforms
5.2.3. Sub-Object Mode
5.2.4. Reference Coordinate Systems and Transform Centers
5.2.5. Cloning and Grouping
5.2.6. Box Modeling (Optional)
5.2.7. Statistics in Viewport
5.3. Starting a Visualization Project
5.3.1. 3D Max Design Configuration
5.3.2. Video Modes
5.3.3. Preferences
5.3.4. Configure Paths
5.3.5. Units Setup
5.3.6. Customizing the User Interface
5.4. Assembling Project Files
5.4.1. Data Linking and Importing
5.4.2. DWG Link and Import Options
5.4.3. Layer and Object Properties
5.5. 3D Modeling from 2D Objects

5.5.1. Drawing 2D Lines
5.5.2. The Lathe Modifier
5.5.3. 2D Booleans
5.5.4. Terrain Objects
5.5.5. The Extrude Modifier
5.5.6. Boolean Operations
5.5.7. The Sweep Modifier (Optional)
5.5.8. Loft Objects (Optional)
5.5.9. Using Snaps for Precision
5.6. Materials
5.6.1. Introduction to Materials
5.6.2. How Materials Work
5.6.3. Understanding Maps and Materials
5.6.4. Materials and Material Libraries
5.6.5. Managing Materials
5.7. Material Types and Parameters
5.7.1. Standard Materials
5.7.2. Architectural Materials (Optional)
5.7.3. Multi/Sub-Object Materials
5.7.4. Opacity, Bump, and Reflection Mapping
5.7.5. mental ray Shaders and Materials
5.7.6. Arch & Design Materials
5.7.7. Pro-Materials
5.7.8. Other Material Types
5.7.9. Creating a Decal Texture
5.8. Mapping Coordinates and Scale
5.8.1. Mapping Coordinates
5.8.2. Mapping Scale
5.8.3. Spline Mapping
5.9. Introduction to 3ds Max Design Lighting
5.9.1. 3ds Max Design Lighting Overview
5.9.2. Local vs. Global Illumination
5.9.3. Choosing a Lighting Strategy
5.10. Standard Lighting
5.10.1. Fundamentals of Standard Lighting
5.10.2. Types of Standard Lights
5.10.3. Shadow Types
5.10.4. Photometric Light Objects
5.10.5. Exposure Control
5.10.6. Daylight Lighting
5.11. Lighting and Rendering using mental ray
5.11.1. Scene Preparation for mental ray
5.11.2. Fundamentals of mental ray
5.11.3. Section 2: Rendering with mental ray
5.11.4. mental ray Interior Rendering
5.11.5. Controlling mental ray Quality
5.11.6. mental ray Proxies
5.12. Rendering and Animation
5.12.1. Rendering
5.12.2. Iterative Rendering
5.12.3. Single vs. Double-Sided Rendering
5.12.4. Camera Parameters
5.12.5. Background Images
5.12.6. The Print Size Wizard
5.12.7. Selected Rendering Options

5.12.8. Rendering Pre-sets
5.13. Animation
5.13.1. Animation Controls
5.13.2. Walkthrough Animation
5.13.3. Animation Output
6. Adobe Photoshop Studio
6.1. Navigating the Workspace
6.1.1. The Menu Bar
6.1.2. The Status Bar
6.1.3. The Toolbox
6.1.4. The Palettes
6.2. Working with Documents
6.2.1. Navigator Palette & Hand Tool
6.2.2. New View & Duplicate
6.2.3. Image Size & Resolution
6.2.4. Image Size Dialog Box
6.2.5. Resizing Practice
6.2.6. Canvas Size
6.2.7. Crop Tool
6.2.8. Crop Tool Practice
6.2.9. History Palette Basics
6.2.10. Saving Images
6.3. Image Modes & Color Selection
6.3.1. Color Primer
6.3.2. The Color Picker
6.3.3. Color & Swatch Palettes
6.3.4. Custom Swatch Exercise
6.3.5. Eyedropper & Info Palette
6.3.6. Review & Assignment
6.4. Selections and Masks
6.4.1. Marquee Selection Tools
6.4.2. Lasso & Wand Selection Tools
6.4.3. Selection Tool Practice
6.4.4. Select Menu Commands
6.4.5. Transforming Selections
6.4.6. Quick Mask Mode
6.4.7. More Quick Mask
6.4.8. Alpha Channels & Channel Palette
6.4.9. Mask/Selection Practice Exercises
6.5. Layers and Blend Modes
6.5.1. Intro to Layers
6.5.2. The Layers Palette [V5.x] [V6.x]
6.5.3. Important Layer Information
6.5.4. Move, Copy & Transform Layers
6.5.5. Advanced Layer Features
6.5.6. Layers Review
6.6. Painting Tools
6.6.1. Intro, Paint Bucket and Fill Command
6.6.2. Gradient, Pattern and Line Tools
6.6.3. Brushes and Fade Command
6.6.4. Pencil, Paintbrush and Airbrush Tools
6.6.5. Eraser Tools
6.7. Retouching Tools
6.7.1. Retouching Tools Intro & Tips
6.7.2. Blur, Sharpen, Smudge

22.1.5.1. Course Title: COMMUNICATION SKILLS IV (Sketching parts)

Watercolour, ink and wash, Rendering techniques of presentation drawings, photographic techniques printing, developing, and photomontage.
Course Objectives (Outcomes)
On completion of this course students should be able to:
1. Use watercolour, ink and wash and rendering techniques of presentation drawings, photographic techniques printing, developing, photomontage, and advanced mechanical perspective.
2. Use Commercial package applications. Archi CAD, Architectural Desktop,. ArchiCAD: the ArchiCAD environment,
3. Understand the basic concepts and construction techniques of ArchiCAD tools, the Menu commands and the Archi Cad Library.
4. Understand and use Atlantis studio for further rendering of architectural designs,
5. Understand and use Sketch up to produce urban design projects.

Course outline

week	Title	Description	Assignments & Exercises
1	Introduction	General description of the course material and the overall expectation of the course outcome.	Reading assignment
2	Lecture		
•	Materials	Paper, type of colors, brush, pencil, mixing cup, Showing ranges of colors in color wheel and also the different outcomes of mixing primary, secondary colors.	Color wheel
3	Lecture		
•	Color		
•	Hue		
•	Value		
•	Shade and shadow of colors		Direct exercise on hard paper or A0 while following up the lectures. Using Pencil colors or water colors
4	Lectures		
Color pencil sketching	Still life sketches using color pencil as a media		A3
5	Color pencil sketching (conti…)	Simple building with environment (exterior)	A3
□	Assignment-building interior		
6	Lecture		
•	Crayons and markers rendering	Still life sketches using crayons and markers as a media	A3 hard paper
7	• Crayons and markers rendering	Simple building (exterior)	A3 hard paper
•	Assignment-building interior		
8	• Ink + marker & ink + pencil rendering techniques		A3 paper s still life
•	Assignment-simple building		
9	Lecture		
•	Water color	How to mix, techniques and renderings	A3 Hard paper
Still life			
10	• Water color	A3 Hard paper	
Still life			
11	• Water color	A3 Hard paper	
Flower (zoomed)			
12	• Water color	A3 Hard paper	
Building section			
13	• Water color	A3 Hard paper	
Landscape with environment			
14	• Water color	A3 Hard paper	
Landscape with environment			
15	Lecture		
•	Photo montage	General introduction and definitions	On A2 paper size in different forms applying montage
16	Lectures		
•	photographic techniques printing, developing,	Exercise	
17	Lecture		
•	Collage	Half photo half collage on A4 paper	
Assignment			
•	Collage of a building		

Instructional methods
Lectures, Exercises, Seminars, individual drawing and painting under supervision and tutorial
Evaluation methods
Exercise evaluation, Seminar evaluation
Role of instructor
Offer lectures, administer labs, advise students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Attend classes, do assignments, self study, present presentations, collect and incorporate feedbacks.
Text Book
Color Drawing: Design Drawing Skills and Techniques for Architects, Landscape Architects, and Interior Designers by Michael E. Doyle, Wiley; 3 edition (November 17, 2006) ISBN-10: 9780471741909 ISBN-13: 978-0471741909
Reference
Architecture + Animation (Architectural Design) by Bob Fear, Academy Press (2001) ISBN-13: 978-0471496298
Photographing Architecture and Interiors, Julius ShulmanPrinceton Architectural Press (2000)

Evaluation Scheme

Exercises and assignments	45%
Attendance	5%

22.1.6. Course Title: COMMUNICATION SKILLS V (Advanced computer-aided design approaches in Architecture)

Course Number: Arch 431

Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)

Prerequisite: Arch 332

Course Description

The course focus on advanced computer-aided design approaches, expressions & techniques in architectural study & presentation. The use and applications of various commercial packages such as: Adobe Photoshop, Illustrator and Page maker, Artilants, Sketch up and Archi CAD, and 3D-Max are the principal emphasis of this course. High level accuracy and quality of photorealistic 3D modeling and visualization and geometrical data for testing of complex photogrammetric architectural object for dynamic 3D visualization of objects and buildings will be acquired. The application allows modifying the visualized 3D scene by looking at the object from any viewpoint to enable the rotation, translation and scale change, camera position reconstruction, etc. to permit dynamic realistic 3D visualization with simultaneous preservation of real geometrical relations and architectural space.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Use High level accuracy and quality of photorealistic 3D modeling and visualizations
2. Evaluate and test complex photogrammetric architectural object for dynamic 3D visualization of buildings
3. Create visualized 3D scene by looking at the object from any viewpoint to enable the rotation, translation scale change, and camera position
4. Apply the various soft wares such as: Adobe Photoshop, Illustrator and Page maker to produce design projects and reconstruction to permit dynamic realistic 3D visualization with simultaneous preservation of real geometrical relations and architectural space.

1. Advanced ArchiCAD & Auto CAD Modeling studio
1.1. Create building modeling
1.2. Create Presentation rendering
1.3. Create animation creation
1.4. Edit on a 3D model of a building
1.5. Generate architectural plans, sections, elevations
1.6. Create rendered perspectives
1.7. Create "fly through" animations
1.8. Artilants rendering and virtual reality presentation
2. Advanced 3D-max Modelling studio
2.1. 3D Max House Modeling
2.2. 3DS Max Extruding a Floor Plan
2.3. Visualizing Project
2.4. 3D Max Modeling, Lighting & Rendering
2.5. Interior Lighting with 3DS Max
2.6. Postproduction of 3D scene in Adobe Photoshop
2.7. 3D Max Animation in Architecture.
3. Adobe Photoshop Studio
3.1. Digital watercolour Rendering Technique in Adobe Photoshop
3.2. Architectural Post Processing in Photoshop
3.3. Adobe Photoshop Rendering a Floor Plan
3.4. Architectural Illustrations: Photoshop Landscape
3.5. Site Plan Rendering in Photoshop
4. Creating 3D Animation Multimedia Architecture presentations

22.1.7. Course Title: 3D Modeling Workshop

Course Number: Arch 334

Credit Hour: 3(Lect. 1Hrs, Studio 6Hrs)

Prerequisite: Arch 331

Course Description

In the course the students will develop the ability to make models of conceptual and organizational constructs with different materials and tools. The students should learn how to develop and use physical modeling techniques to process complex design projects. The modeling shall introduce the students to problems of geometry in relation to material and structure. In addition, the course will help the students to apply the knowledge and skill of using the various software packages such as Revit architecture, AutoCAD, and other 3D generating and rendering packages.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Apply principles of descriptive geometry and pattern development in making physical models
2. Become familiar with different modeling techniques of architectural buildings.
3. Produce physical models of various objects and buildings at various scales.
4. Develop the understanding and use of 3D physical modeling for architectural presentations

1. Introduction
2. Types of Models
2.1. Topographic Models
2.1.1. Site models
2.1.2. Landscape models
2.1.3. Models of gardens
2.2. Volumetric Models
2.2.1. Urban design models
2.2.2. Building models
2.2.3. Structural models
2.2.4. Interior models
2.2.5. Detail models
2.3. Specialty Models
3. Material and Equipment
3.1. Materials
3.1.1. Papers, boards, cardboards
3.1.2. Solid foam
3.1.3. Acrylic glass, polystyrene
3.1.4. Metal
3.1.5. Found objects, natural and man-made
3.1.6. Small components
3.1.7. Glues, adhesive tapes, adhesive films
3.1.8. Tools
3.1.9. Machinery
4. The Work Space
4.1. Basic Equipment
4.2. The Expanded Workshop

5. Preparing to Work
5.1. Checklist
6. Making Separate Pieces
6.1. The Model Base
6.1.1. Section and form
6.1.2. Materials
6.1.3. Substructure, base, frame
6.1.4. Assembling in parts, protective covers
6.2. The Site
6.2.1. Scale, material, color
6.2.2. Building up the topography
6.2.3. Circulation, greenery, and water
6.3. Models of Buildings
6.3.1. Linear sections and profiles
6.3.2. Soldered structures
6.3.3. Flat pieces
6.3.4. Massing
6.4. Plaster Models
6.4.1. How to construct
6.4.2. Working with plaster models
7. Materials that give Scale
7.1. Scale Trees and Bushes
7.2. Scale Figures
7.3. Scale vehicles
7.4. Small Elements
8. Making CNC Models
8.1. Types of Equipment
8.2. CNC Milling
8.3. CNC Laser Cutter
8.4. Rapid Prototyping
9. Use Of Color In The Model
9.1. Material Colors
9.2. Applying Color
10. Model Photography
11. Model Requirements

22.1.8. Course Title: BASIC DESIGN I

Course Number: ***Arch 242***
Credit Hour: **3(Lect. 1Hrs, Studio 6Hrs)**
Prerequisite: ***None***

Course Description

This course is a base for coming Architectural and Urban Design courses. It deals with building blocks of any visual design called Elements of Design including points, lines, planes, texture & form, Then it explains how these design elements can be organized to create visual compositions using Principles of Design like harmony, rhythm, axis, repetition, emphasis, symmetry, balance, proportion, scale, datum, hierarchy, contrast etc. It also deals with form properties, creation, transformation, organization and articulation.

Course Objective (Outcomes)

Understanding design language (design elements and principles) helps any designer to come up with creative compositions (solutions). Hence the main objective of this course is to enable you broaden and enrich your vocabulary and grammar of the basis of any design. Hence at the end of the course, you will be able to:

- Explain type, character and perception of design elements(K)
- Identify principles and ways of organizing design elements (K)
- Express different ideas and concepts using design elements and principles(S)
- Communicate with related professional using design language(S)
- Perceive visual compositions in different perspective (A)
- Explore your surrounding environment in terms of design elements and principles (A)

Course Outline

No	Topics	Date
1	**Introduction** - Composition - Background/Foreground	1st week
2	**Primary Design Elements** - Point	2nd Week
3	**Design Elements (cont…)** - Line	3rd Week
4	**Design Elements (cont…)** - Shape	4th Week
5	**Design Elements (cont…)** - Texture	5th - 6th Week
6	**Design Elements (cont…)** Form - Propriety - Transformation & Creation - Articulation - Organization	7th - 8th Week
7	**Design Principles** - Symmetry & Balance	9th Week
8	**Design Principles (cont…)** - Repetition & Rhythm	10th Weeks
9	**Design Principles (cont…)** - Harmony & Contrast	11th Weeks
10	**Design Principles (cont…)** - Hierarchy & Datum	12th Weeks
11	**Design Principles (cont…)** - Emphasis & Axis	13th Weeks
12	**Design Principles (cont…)** - Proportion & Scale	14th Weeks
13	**Semester Project**	15th - 16th Weeks

Instructional methods

Comprehensive weekly detailed design exercises, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Exercises, Assignments, Presentation & Jury evaluation on projects

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self study, do assignments, present presentations, collect and incorporate feedbacks.

Course Evaluation

- Weekly Assignments……..……..50%
- Exercises……20%
- Semester Project..……..30%

100%

Textbook

Architecture: Drafting and Design, Hepler, Donald 1987, 50 copies

Reference

1. Architecture: Form, Space, & Order, by Francis D. K. Ching, Wiley; 3rd Edition (2007), ISBN-13: 978-0471752165
2. Design & Technology, 1996, By James Garratt
3. Tools for Ideas: An Introduction to Architectural Design, by Christian Gänshirt Birkhäuser Basel; 1 edition (2007) ISBN-13: 978-3764375775

22.1.9. Course Title: BASIC DESIGN II

Course Number: ***Arch 341***
Credit Hour: **3(Lect. 1Hrs, Studio 6Hrs)**
Prerequisite: Arch 242

Course Description

This course is a continuation of Basic Design I and it deals with advanced elements of design like: Space- Space Defining Element, Spatial (Space) Relationship, and Spatial (Space) Organization & Quality of Space. Color- History of Color, Nature of Color, Theory of Color, Color Properties, Color Harmony & Color Psychology: Light& Shadow- Nature of light, Propriety of Light and Application of light in design.

Course Objective (Outcomes)

The main objective of the course is to enable you understand and apply basic elements of design like space, color, shadow and light in design of simple compositions and elementary buildings.

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

- Understand the nature, propriety and psychology of space, color and light/shadow.
- Apply space, color and light in the design of compositions
- Express different ideas and concepts using space, color and light
- Apply elements and principles of design in the design of small scale projects

Course Content

Week	Lecture Topics	Studio Activity	Home Activity
1	Introduction	Discussion on the course syllabus	-
2	Space • Space defining elements	**Studio Exercise:** • Space defining elements	**Assignment:** Space defining elements
3	Space (Cont…) • Spatial relationship	**Studio Exercise:** • Spatial relationship	**Assignment:** Spatial relationship
4	Space (Cont…) • Spatial organization	**Studio Exercise:** • Spatial organization	**Assignment:** Spatial organization
5	Space (Cont…) • Spatial Quality	**Studio Exercise:** • Spatial Quality	**Assignment:** Spatial Quality
6	**Color** • History of Color	**Discussion** • **Color History**	**Reading**
7	Color (Cont…) • Nature of Color	**Discussion** • Color Nature	**Reading**
8	Color (Cont…) • Theory of Colour	**Studio Exercise:** • Theory of Color	**Assignment:** Theory of Color

9	Color (Cont…) • Propriety of Color	**Studio Exercise:** • Propriety of Color	**Assignment:** Propriety of Color
10	Color (Cont…) • Composition of Color	**Studio Exercise:** • Composition of Color	**Assignment:** Composition of Color
11	Color (Cont…) • Psychology of color	**Studio Exercise:** • Psychology of color (5%)	**Assignment:** Psychology of color
12	Light • Nature and Application of Light	**Studio Exercise:** • Application of Light (5%)	**Assignment:** Application of Light
13	Semester Project • Small Scale Quick Design	**Consultation** • Quick Design: Bus Stop Design	
14	Examination • Space, Color and Light	**Examination Session**	
15 16	**Submission & Presentation of Project**	**Submission & Presentation**	

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation, examinations

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self study, do assignments, present presentations, collect and incorporate feedbacks.

Course Evaluation

- Weekly Assignments……..50%
- Exercises……20%
- Semester Project..……..30%

Text Book

How Designers Think, Bryan Lawson, Architectural Press; 4th edition (2005)
ISBN-13: 978-0750660778

Reference

1. Architecture: Form, Space, & Order, by Francis D. K. Ching, Wiley; 3rd Edition (2007), ISBN-13: 978-0471752165
2. Design Thinking: Understanding How Designers Think and Work by Nigel Cross, Berg Publishers (May 15, 2011) ISBN-10: 9781847886361 ISBN-13: 978-1847886361
3. Language of Space, Bryan Lawson, Architectural Press; 1st edition (2001), ISBN-13: 978-0750652469

22.1.10. Course Title: ARCHITECTURAL DESIGN I

(Architecture for Residence)

Course Number: ***Arch 441***
Credit Hour: **4(Lect. 2Hrs, Studio 6Hrs)**
Prerequisite: Arch 232

Course Description

The purpose of this course is for the students to advance in their understanding of the architectural design processes and elements (Function, Space & Form) including communicating ideas and making artistic judgments. The course familiarizes students with the perception of Architectural Spaces and Forms and develops abilities to design simple spaces and compositions, by considering the site factors, functional activities and client requirements. It introduces students to the meaning and concept of Architecture and Architectural Design Process: Phases and Steps of Architectural Design Process. It familiars students with Site Factors: Climatic, Geological, Topographic, Circulation, Manmade, Sensory & Urban Context Design Factors. It introduces students to basic components of the building fabric: Function, Space, Form & Building Systems: Circulation, Structure, Roofing, Lighting, Ventilation…The theme of the course is to introduce students to design process and issues from simple (Villa) to moderate buildings (Apartment).

Semester Project:

1. Project I: Uni-family Multi-story Residential Building
2. Project II: Multi Family Multi-story Residential Building (No Soft ware application totally)

Course Objective (Outcomes)

On completion of this course students should be able to:

1. Implement an iterative design process from problem identification, information gathering, solution generation and evaluation, implementation, presentation, and overall project evaluation.
2. Do literature review, precedent review, client, user and site analysis and incorporate them in the design process
3. Analyze and synthesize basic components of the building fabric for Residential Buildings: Function, Space & Building Systems: Circulation, Structure, Roofing, Lighting, Ventilation…
4. Understand the bylaws related to the project work
5. Undertake conceptualization, articulation and representation of architectural ideas and making aesthetic judgments of building design.
6. Express your design solutions graphically as well as using model.

Course Outline

Week	Lecture Topics	Studio Activity	Home Activity
1	Introduction	Discussion on the course syllabus	-
2	What is Architecture?	**Discussion:** • Architecture & related fields	-
3	Architectural Design Process	**Discussion** • Design Process • Project I/Villa	• Literature Review • Precedence Review
4	Research • Literature • Precedence o House Styles	**Discussion** • Literature Review • Precedence Review o House Styles	• Site Analysis & Site Adaptation
5	Site Analysis • Graphical Site Factors Analysis	**Consultation:** • Site Analysis & Adaptation	• Bubble Diagram
6	Site Adaptation • Orientation • Topography • Sun Path	**Consultation:** • Bubble Diagram	• Schematic Diagram
7	Function in Architecture • Access (Entrance)	**Consultation:** • Schematic Diagram	• Formal Study • Structural System
8	Function (Cont….) • Circulation (Path)	**Consultation:** • Preliminary Design	• Final Design
9	Function (Cont….) • Functional Flow (Sequence)	**Submission & Jury**	
10	Building System (Cont….) • Circulation : Stair Cases	**Project II:** • Apartment	• Literature Review • Precedence Review
11	Building System (Cont….) • Structure o Elementary Framed Structures	• Literature Review • Precedence Review	• Site Analysis, Planning & Adaptation
12	Building System (Cont….) • Roof	**Consultation:** • Site Analysis, Planning	• Zone Diagram • Bubble Diagram

	○ Sloping Roof ○ Flat Roof	& Adaptation	
13	Building System (Cont….) • Opening ○ Windows ○ Doors	**Consultation:** • Zone Diagram • Bubble Diagram	• Schematic Diagram
14	Building System (Cont….) • Wall ○ Façade Treatment	**Consultation** • Schematic Diagram	• Preliminary Design
15	-	**Consultation** • Preliminary Design ○ Structure ○ Form ○ Facade	• Final Design
16	-	**Presentation & Jury**	

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), assignments

Evaluation Scheme

Assignments	20%
Project I work	40%
Project II work	40%

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

1. Analyzing Architecture, by Simon Unwin, Routledge; 2nd edition (2009),ISBN-13: 978-0415489287
2. Universal Principles of Design, Revised and Updated: 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design by William Lidwell, Kritina Holden and Jill Butler (Jan 1, 2010)

References

1. House Design, by Daab and Daab (2005) ISBN-13: 978-1876907426
2. Architectural Drawing and Light Construction,By Muller, Fauesett & Grau, 1999
3. Precedents in Architecture: Analytic Diagrams, Formative Ideas, and Parts, Roger H. Clark, Michael Pause, Wiley; 3 edition (2004) ISBN-13: 978-0471479741
4. Architecture: Form, Space, and Order by Frank Ching, Wiley; 3 edition (June 29, 2007) , ISBN-10: 0471752169 ISBN-13: 978-0471752165

22.1.11. Course Title: ARCHITECTURAL DESIGN II **(Architecture for Commerce & Education)**

Course Number: ***Arch 442***
Credit Hour: **3(Lect. 1Hrs, Studio 6 Hrs)**
Prerequisite: Arch 441

Course Descriptions

The course aims to equip students with the basic analytical and methodological skills to deal with the design of moderately complex buildings such as for administration and education. The theme of the course is how to deal with High Rise buildings and Multi Blocks complexes in urban complex. The course familiarizes students with the perception of Architectural Spaces and Forms and develops abilities to design of moderately complex High Rise and Multi Block spaces, forms, functions and compositions. It introduces students to design issues in moderately complex High Rise and Multi Block Buildings like structural, circulation, parking, opening, wall, fire escape, building design service systems.

Semester Project:

1. Project I: Commercial Bldg: High Rise Office /Mixed Use Building
2. Project II: Education Bldg: School/ College/ Building

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Appreciate the methodological design approach to fairly complex High Rise and Multi Block Buildings.
2. Analysis of spatial, functional and formal configuration in fairly complex High Rise and Multi Block buildings for commerce, administration and education.
3. Synthesis of different building systems issues in moderately complex High Rise and Multi Block Buildings like structural, circulation, parking, opening, wall, fire escape, building design service systems.
4. Building appropriately through analysis of landscape and climate

Course Outline

Wee	Lecture Topics	Studio Activity	Home Activity
1	Introduction	Discussion on the course syllabus **First Project:** • Commercial Building	• Literature Review • Precedence Review
2	Space • Architectural Space Definition • Architectural Space Relationship	**Consultation:** • Literature Review • Precedence Review	• Site Analysis • Site Adaptation • Site Planning
3	Space (cont…) • Architectural Space Organization • Architectural Space Quality	**Consultation:** • Site Analysis • Site Adaptation	• Zone Diagram • Bubble Diagram • Schematic Diagram
4	Form • Architectural Form Type & Propriety • Architectural Form Creation & Transformation	**Consultation** • Zone Diagram • Bubble Diagram • Schematic Diagram	• Form • Facade • Structural System
5	Form (cont…) • Architectural Form Organization • Architectural Form Articulation	Consultation • Form & Facade • Structural System	• Preliminary Design
6	Building System • Circulation o Vertical Core o Horizontal Connections	**Intermediate Presentation & Jury**	**Final Design**
7	Building System • Sanitary System o Wet Core o Site Drainage	**Consultation** • Incorporation of intermediate jury comments	**Final Design**
8	Building System • Wall System o Light weight Bldg Skin o	**Presentation & Jury** • Project I	
9	Building System	**Second Project:**	• Literature Review

	• Opening o Light, Sun Protection& Ventilation in High Rise Buildings	• Education Building	• Precedence Review
10	Building System • Fire Escape System o Open System o Enclosed System	**Consultation:** • Literature Review • Precedence Review	• Site Analysis • Site Adaptation • Site Planning
11	Building System • Vehicular Circulation & Parking in Buildings and Compound	**Consultation:** • Site Analysis • Site Planning • Site Adaptation	**Functional Analysis** • Site Analysis • Site Planning • Site Adaptation
12	Building System • Structure o Structural System for High Rise Buildings	**Consultation** • Zone Diagram • Bubble Diagram • Schematic Diagram	**Aesthetical Analysis** • Form • Façade • Spatial Organization • Structural System
13	Building Services as related to Architecture • Provision of service systems in design	**Consultation** • Form • Façade • Spatial Organization • Structural System	**Preliminary Design**
14	Site Planning • Soft Surfaces • Hard Surfaces • Organization & **Landscaping**	**Intermediate Jury**	**Final Design**
15	-	• Incorporation of intermediate jury comments	**Final Design**
16	-	**Presentation & Jury** • Project II	-

Instructional methods

Comprehensive /detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), assignments

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Architecture of Schools: The New Learning Environments by Mark Dudek (Dec 15, 2000) ISBN-13: 978-0750635851

References

1. Libraries and Learning Resources Centers: Planning and Design, Brian Edwards and Biddy Fisher ISBN-13: 978-1856176194
2. Architecture: Form, Space, and Order by Frank Ching, Wiley; 3 edition (June 29, 2007) , ISBN-10: 0471752169 ISBN-13: 978-0471752165

Evaluation Scheme

Assignments	20%
Project I	40%
Project II	40%

22.1.12. Course Title: ARCHITECTURAL DESIGN III **(Architecture for recreation & culture)**

Course Number: **Arch 541**
Credit Hour: **3(Lect. 1Hrs, Studio 6Hrs)**
Prerequisite: Arch 442

Course Description

The course aims to introduce students to the social, cultural and technical aspects of architect. It enables students to design a fairly complex building in a natural suburb landscape. It helps students to analysis local architecture and technology and synthesis local know how to come up with design which is integrated with local context. The theme of the course is how to integrate context, culture, local material and technology, natural environment and vernacular architecture in design.

Semester Project:

1. Project I: Recreational Buildings like Hotels, Sport Buildings, Recreation Centers
2. Project II: Cultural Buildings like Museums, Galleries, Theater, Cultural Centers

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Analyze vernacular architecture spatial, functional, structural and formal dispositions
2. Appreciate local social, cultural and historical know how
3. Synthesis local social, cultural and historical know how as well as vernacular spatial, functional, structural and formal dispositions in architectural design
4. Discuss the role of architecture in mediating culture, nature and ethnology.
5. Integrate a building with local context: site, environment & landscape.

Course Outline

Wee	Lecture Topics	Studio Activity	Home Activity
1	Introduction • Concept in Architecture	Discussion on the course syllabus **First Project:** • Recreation Building	• Literature Review • Precedence Review -
2	Vernacular Architecture • Vernacular Arch're Analysis • Vernacular Arch're Synthesis	**Consultation:** • Literature Review • Precedence Review • Site Planning	• Site Analysis • Site Adaptation • Site Planning
3	Culture & Architecture • Cultural Issues Analysis	**Consultation:** • Site Analysis	**Function** • Zone Diagram

	• Cultural Issues Synthesis • Architectural Space Quality	• Site Adaptation	• Bubble Diagram • Schematic Diagram
4	History & Architecture • Historical Precedence Analysis • Historical Precedence Synthesis	**Consultation** • Zone Diagram • Bubble Diagram • Schematic Diagram	**Aesthetics** • Spatial Analysis • Form & Façade • Structure
5	Feeling & Architecture • How architecture moves our feelings	**Consultation** • Spatial Analysis • Form & Façade • Structure	**Preliminary Design** • Site & Floor Plan • Section • Form
6	Building System • Circulation o Circulation in terrain sites	**Intermediate Jury & Presentation**	• Final Design Preparation
7	Building System • Sanitary System o Sanitary system in natural environment	• Incorporation of intermediate jury comments	• Final Design Preparation
8	Building System • Wall System o Skin treatment in cultural building	**Presentation & Jury** • Recreation Building	
9	Building System • Opening o Light in light sensitive spaces	**Second Project:** • Cultural Building	• Literature Review • Precedence Review -
10	Building System • Vehicular Circulation & Parking in terrain sites o	**Consultation:** • Literature Review • Precedence Review	**Site Planning:** • Site Analysis • Site Adaptation • Site Planning
11		**Consultation**	**Function**

		• Site Analysis • Site Adaptation • Site Planning	• Zone Diagram • Bubble Diagram • Schematic Diagram
12		**Consultation** • Zone Diagram • Bubble Diagram • Schematic Diagram	**Aesthetics & Structure** • Spatial Configuration • Form & Façade • Structural System
13		**Consultation** • Spatial Configuration • Form & Façade • Structural System	**Preliminary Design** • Site & Floor Plan • Section • Form
14	-	**Intermediate Presentation & Jury**	• Final Design Preparation
15	-	• Incorporation of intermediate jury comments	• Final Design Preparation
16	-	**Presentation & Jury** • Project II	-

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), assignments

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Flexible: Architecture that Responds to Change, Robert Kronenburg, (2007) ISBN-13: 978-1856694612

References

Towards Sustainable architecture, Edwards, Brain ISBN-13: 978-0750624923ISBN-13: 978-0750641340

Evaluation Scheme

Assignments	20%
Project I	40%
project II	40%

22.1.13. Course Title: ARCHITECTURAL DESIGN IV

Course Number: ***Arch 542***
Architecture for Service & Production
Credit Hour: **3(Lect. 1Hrs, Studio 6Hrs)**
Prerequisite: Arch 541

Course Description

The course aims to give students advanced analytical skills to deal with more complex architectural design problems in a comprehensive manner. The course focuses on more functional and technical buildings. The theme of the course is how to deal with functional buildings and to integrate function, technology and production processes in Architecture. Students will be exposed to more functional buildings like Hospitals, Farm and Industrial Buildings.

Course Objectives

On completion of this course students should be able to:

1. Analyze functional and structural configuration in more functional buildings, program analysis and development of requirement.
2. Discuss the role of architecture in service provision and production process.
3. Synthesis production& serviced delivery process, technology, structure in designing production and service buildings.

Semester Project:

1. Project I: Public Service Buildings like Hospital, Court House, Convention Centers, Exhibition centers
2. Project II: Production Buildings like Industrial and Farm Building

Course Outline

Wee	Lecture Topics	Studio Activity	Home Activity
1	Introduction • Production & Architecture	Discussion on the course syllabus **First Project:** • Civic Service Building	• Literature Review • Precedence Review -
2	Project Selection • Demand Analysis • Benefit Analysis	**Consultation:** • Literature Review • Precedence Review • Site Planning	• Site Analysis • Site Adaptation • Site Planning
3	Design Program Development	**Consultation:**	**Function**

	• Functional Requirements • Space Standards	• Site Analysis • Site Adaptation	• Zone Diagram • Bubble Diagram • Schematic Diagram
4	Site Location Selection • Site Requirements • Master Plan • Service/Population Standard	**Consultation** • Zone Diagram • Bubble Diagram • Schematic Diagram	**Aesthetics** • Spatial Analysis • Form & Façade • Structure
5	Design Report • Contents • Format • Presentation Technique	**Consultation** • Spatial Analysis • Form & Façade • Structure	**Preliminary Design** • Site & Floor Plan • Section • Form
6	-	**Intermediate Jury & Presentation**	• Final Design Preparation
7	-	• Incorporation of intermediate jury comments	• Final Design Preparation
8	-	**Presentation & Jury** • Recreation Building	
9	-	**Second Project:** • Production Building	• Literature Review • Precedence Review -
10	-	**Consultation:** • Literature Review • Precedence Review	**Site Planning:** • Site Analysis • Site Adaptation • Site Planning
11	-	**Consultation** • Site Analysis • Site Adaptation • Site Planning	**Function** • Zone Diagram • Bubble Diagram • Schematic Diagram

12	-	**Consultation** • Zone Diagram • Bubble Diagram • Schematic Diagram	**Aesthetics & Structure** • Spatial Configuration • Form & Façade • Structural System
13	-	**Consultation** • Spatial Configuration • Form & Façade • Structural System	**Preliminary Design** • Site & Floor Plan • Section • Form
14	-	**Intermediate Presentation & Jury**	• Final Design Preparation
15	-	• Incorporation of intermediate jury comments	• Final Design Preparation
16	-	**Presentation & Jury** • Project II	-

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Places of the Soul: Architecture and Environmental Design as a Healing Art by Christopher Day (Dec 1, 2003) ISBN-13: 978-0750659017

References

Congress Convention and Exhibition Facilities: Planning and Design, Fred Lawson ISBN-13: 978-0750627900

Evaluation Scheme

Assignments	20%
Project I	40%
Project II	40%

22.1.14. Course Title: URBAN DESIGN

Course Number: Arch 443

Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)

Prerequisite: Arch 332 [Communication skills IV]

Year and Semester:

Instructor:

Academic Year:

Course Description:

The course aims to equip students with the basic analytical skills and knowledge of urban design and planning issues, approaches and methods. The course includes recent trends and application to new urban areas.

Course Objectives:

On completion of this course students should be able to:

1 Plan the architecture of the city: paths, edges, urban furniture, districts, nodes and landmarks;
2 Pattern urban form: streets, monuments, squares and blocks; urban design and conservation: urban analysis, morphology.
3 Complete project work on Urban Details, Streets/Block/ Square Design.
4 Understand theories of urban form: group from, compositional form, mega structure be able to do urban analysis: morphology, typo-morphology and urban tissues.
5 Understand urban land management: problem, issues, recent trends and considerations, regional planning, space-economy theories, basic concepts and processes.
6 Design of new urban entities, new neighborhoods using implementation techniques and design guidelines.

Course Outline:

Weeks		Topic	Remarks
1st Wk	1.0	Introduction	
1st Wk	1.1	What is Urban Design	
1st Wk	1.2	History of Urban Design	
1st Wk	2.0	Urban Design Theory	
1st Wk	2.1	Elements of Urban Design	
1st Wk	2.2	Principles for Urban Design	
2ndWk	3.0	Graphics in Urban Design	
2ndWk	4.0	Dimensions of Urban Design	
2ndWk	4.1	Road Network- Structure of an Urban Space	
2ndWk	4.2	Land Use	
3rdWk	4.3	Block Definition	
3rdWk	4.4	Street Pattern	
4thWk	4.5	Parking	
4thWk	4.6	Landscaping	
5thWk	4.7	Open Space	
6thWk	5.0	Urban Design Standards	
6thWk	6.0	Location Theory	
6thWk	7.0	Analyzing Existing Situation	
6thWk	8.0	Morphology	
6thWk	9.0	Neighborhood Design.....Project 1	
6thWkUpto10thWk	10.0	Neighborhood and design process	

- Site Selection
- Site selection criteria

- Site Assessment and Analysis
- Environmental Impact Assessment
- Concept Plan
- Project site versus Neighborhood plan expression

Neighborhood design guide lines, norms and standards

- Built Up Density
- Building typology
- Open space
- Building lay out and orientation
- Set back Regulation
- Road
- Utility Line
- Service

Consultation on the Student's Studio Project

11thWk	Student's Intermediate Presentation
15thWk	Student's Final Presentation

Instructional Methods:

Lectures,(Presentations, Seminars, Guests) Projects (Computer based urban design projects, Models, Student Presentations) Consultations (individual consultations, Intermediate presentations) Excursion

Assessment Methods:

Theoretical Exams, Quiz, Jury Evaluation (Project presentation for Internal and external guests and lecturers)

Role of Instructor:

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of Students:

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Reference Books:

Urban design compendium 1&2	llewelyn - davies
Urban design: method and techniques	Cliff Moughtin, Rafael Cuesta,
Neighborhood planning and design manual	Samuel A., Liku W., Lulit Z.
URBAN DESIGN graphics	Bally Meeda, Neil Parkyn, David Stuart Walton
T h e urban design handbook	Ray Gindroz
Time Saver Standards for Urban Design	Donald Watson

22.1.15. Course Title: URBAN PLANNING

Course Number: Arch 543

Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)

Prerequisite: Arch 443 [Urban Design]

Year and Semester:

Instructor:

Academic Year:

Course Description:

The course aims to equip students with theoretical, methodological and practical skills to deal with complex urban design and planning problems

Course Objectives:

On completion of this course students should be able to:

1. Know the Basic know how of the urban planning and urban planning process.
2. Detail plans for Strategic Local Development, upgrading, redevelopment, land development, conservation, and action areas.
3. Initiating Local Development Plans using the participatory process, spatial and detail infrastructure design, plot parcellation setting design guidelines for building development.
4. Design within the existing urban fabric: urban renewal.
5. Imagine the city, paths, edges, districts, nodes and landmarks, pattern of urban form: streets, squares, moments..
6. Exercise redevelopment planning or intervention in an existing urban setting.
7. Design projects which include implementation techniques and design guidelines.

Course Outline:

Topic

Introduction

What is Urban Planning?
Rationality, Definition, types
Difference & Similarities b/n Urban planning & Urban Design
History of Town Planning
Major Town Planners
A Brief History of Towns in Ethiopia
A Brief History of Town Planning in Ethiopia

Why Planning?

Urban Life Cycle
Theory of Urban Growth
The Concentric zone Theory (Burgess)
Sector Concept
Multiple Nuclei Concept

The Use and Value of Urban Planning

Ideologies and Models of Early Urban Planning
Urban Planning : Approaches and Methodologies
Characteristics of Urban Systems
Principles and Guidelines of Urban Planning
Urban planning and development

Local plan
Structure plan (development plan)
Land use (Master plan)
Detail Plan
Action Plan
Land Use And Transportation Planning Issues
Existing Situation Analysis and Data Gathering .Small Town Visit
Planning process.....Project One

Location Theory

Market
Residential areas
Manufacturing activities
Office activities
Commercial and retailing activities
Services, etc

Project

Vision Setting, Conceptual Plan
Preliminary Land use, Land use Compatibility
Block Arrangement and Street Network
Communal Space and Green Area
Intermediate Presentation
Final consultation
Final Presentation

Instructional Methods:

Lectures,(Presentations, Seminars, Guests) Projects (Computer based urban design projects, Models, Student Presentations) Consultations (individual consultations, Intermediate presentations) Excursion(Small town visit; lecture on site and consultation on student's report)

Assessment Methods:

Theoretical Exams, Quiz, Site Visit Report evaluation, Jury Evaluation (Project presentation for Internal and external guests and lecturers)

Role of Instructor:

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of Students:

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Reference Books:

Sustainable Urban Planning-Tipping the Balance Robert Riddell
Urban Planning Theory Since 1945 Nigel Taylor Contemporary
Urban planning Lavy, John M
Urban Land use Planning Philip R. Berke, David R. Godchalk

22.1.16. Course Title: LANDSCAPE ARCHITECTURE

Course Number: Arch 445

Credit Hour: 2 (Lect. 1Hrs, Studio 3Hrs)

Prerequisite: Arch 232 [Communication skills II]

Year and Semester:

Instructor:

Academic Year:

Course Description:

The course will help the student's to know the History of Landscape Architecture as well as make them understand the Site planning, site survey and analysis. Designing with land forms, plants, water and stone. Special organization of the outdoor environment with sculptural forms, paths, places, materials, color, art, graphics, fixtures and furnishings. Presentation techniques of landscape design information. Studio projects.

Course Objectives:

On completion of this course students should be able to:

1. Discuss the history of Landscape Architecture.
2. Understand site planning, site survey and analyze. Principles of landscape planning, design and development.
3. Design with land forms, plants, water and stone.
4. Make special organization of the outdoor environment with sculptural forms, paths, places, materials, color, art, graphics, fixtures and furnishings.
5. Know presentation techniques of landscape design information.

Course Outline:

Weeks	Topic	Remarks
1.0	What is Landscape Architecture?	
1.1	Why Landscape Architecture?	
1.2	Fundamentals of Landscape Architecture	
1.3	Interpretations of landscape architecture	
1.4	Profession of landscape architecture	
2.0	Introduction of landscape graphics	
2.1	Presentation techniques and graphics in Landscape design	
2.2	(Graphics Portfolio Preparation)	– Assignment 1
3.0	Site planning	
3.1	Site planning site surveying and analysis	
4.0	History of landscape Architecture	
4.1	Japanese Gardens,	
4.2	Italian Gardens and French Gardens,	
4.3	English Gardens and Islamic Garden	
4.4	Modern Gardens	
4.5	Mughal Gardens	
5.0	Elements of landscape Architecture	
5.1	Resources - Land form, Water, Vegetation	
5.2	Submission of the Assignment 1(Graphics Portfolio)	
5.3	Natural elements	

5.4 Artificial elements

5.5 Introduction of the Design Project (Children's Park) .....Project 1

Collection of plant materials – Assignment 2

5.6 Hard Landscape elements

Edge treatment
Markers and bollards
Fences, rails and gates
Walls
Ha-ha
Trellises
Pergolas
Garden lighting

Submission of plant materials – Assignment 2

Concept of the Design Project

6.0 Intermediate Submission

7.0 Preparation for Final Submission

8.0 Final Submission

Instructional Methods:

Lectures,(Presentations, Seminars, Guests) Projects (Computer based Landscape design projects, Models, Student Presentations) Consultations (individual consultations, Intermediate presentations) Excursion(Exemplary local landscape design visit; lecture on site and consultation on student's report)

Assessment Methods:

Theoretical Exams, Quiz, Site Visit Report evaluation, Jury Evaluation (Project presentation for Internal and external guests and lecturers)

Role of Instructor:

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of Students:

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Reference Books:

Landscape Detailing – Littlewood, Michael
The Architecture And Landscape Gardening Of The Exposition – Louis Christian Mullgardt
American Eden : Landscape Architecture of the Pacific West – Michael Leccese
Modern Landscape Architecture :Redefining the Garden – Jory Johnson, Felice Frankel
Between Landscape Architecture and Land Art – Udo Weilacher
Layout Techniques for Landscape Architecture – Gary Austin
Landscape Architecture – John O. Simonds
The Landscape of Man – Geoffrey and Susan Jellicoe
Landscape Graphics – Grant W. Reid
Site Design and Construction Detailing – Theodore D. Walker
Planting Design – Brian Hackett
Introduction to Landscape Design – John L. Motloch
Techniques of Landscape Architecture – A.E. Weddle
An Introduction to Landscape Architecture – Michael Laurie
Planting Design – Theodore D. Walker
The History of Garden Design – Monique Mosser and Georges Teyssot
Modern Gardens – Peter Shepheard
Contemporary trends in Landscape Architecture – Steven L. Cantor
New Landscape Architecture – Nicolette Baumeister

22.1.17. Course Title: ECOLOGICAL ARCHITECTURE

Course Number: Arch 545

Credit Hour: 2 (Lect. 1Hrs, Studio 3Hrs)

Prerequisite: Arch 442 [Architectural design II]

Year and Semester:

Instructor:

Academic Year:

Course Description:

The course focuses on the relationship between the balance of nature and the effects of human settlement. The students shall become aware of the meaning and challenge of sustainable development. They shall gain the capability of making rational decisions on the basis of fundamental knowledge and awareness of ecological issues.

Course Objectives:

On completion of this course students should be able to:

1 Apply the principles of ecology and architecture to urban ecology using examination of materials, methods and theories in architecture through ecosystem balance.
2 Design and build with and in nature renewable resources and the Ethiopian context.

Course Outline:

Weeks Topic Remarks

Introduction

What is Ecological Architecture?

What is Ecological Architecture all about?

Historical Trends in Ecological Architecture

Introduction to Sustainable Development

Hannover Principles

Ecoscopy

Why Ecological Architecture?

Global and local Environmental Problems

Ecological footprint of a City

Ecological Imbalance

Global Warming

Ecological Architecture as part of a solution

Contemporary Practices

Vernacular High-tech

Local Materials

Site adaptation

Daylight and Ventilation

Models

Sustainable Architecture

Sustainability Matrix

Analysis of local Cities.....Project 2

Principles of Sustainable Architecture

Economy of Resources

Life Cycle Design

Human Design
Strategies and Methods
Economy of Resources
Conservation of Water
Conservation of materials
Conservation of energy
Life Cycle Design
Human Design
Energy Plus-Architectural and Mechanical Designs
Sustainable Urban and Community Design

Instructional Methods:

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment Methods:

Jury evaluation on projects (including external jury), seminar evaluation, 60%
Exams, Quiz 40%

Role of Instructor:

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of Students:

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Reference Books:

Sustainable design, Ecology, Architecture, and planning Daniel E. Williams, FAIA
The Ecology of Building Materials Bjørn Berge

22.1.18. Course Title: INTERIOR DESIGN

Course Number: Arch 691

Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)

Prerequisite: Arch 441 [Architectural design I]

Year and Semester:

Instructor:

Academic Year:

Course Description:

With emphasis on the principles of residential design, the course includes research into and analysis of office spaces, public spaces such as retail, health care, houses of worship, restaurants, and hotels. Students complete individually selected comprehensive design solutions that involve client analysis, programming, and the determination of interior architectural materials, furnishings, and light design. The complete design process is emphasized with research, code implications, and design specifications applied in the student documentation. Signage, way finding, and security issues are highlighted.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1 Do research into and analysis of office spaces, public spaces such as retail, health care, houses of worship, restaurants, and hotels.
2 Complete individually selected comprehensive design solutions that involve client analysis, programming, and the determination of interior architectural materials, furnishings, and light design.
3 Understand the complete design process is emphasized with research, code implications, and design specifications applied in the student documentation. Signage, way finding, and security issues are highlighted.

Course Objectives:

The course aims to introduce students to the fundamentals of theory and practice of interior design and its relationship to other design disciplines. The course emphasizes correctness of fit among objects, spaces, and people as well as the physiological and psychological needs of those using them.

Course Outline:

Weeks	Topic	Remarks
1.0	Introduction	
1.1	What is Interior Design	
2.0	Graphics in interior Design	
2.1	Basic Drafting Symbols	
3.0	Design Objectives	
4.0	Interior Spaces	
4.1	Element and composition of Interior Spaces	
4.2	Lighting	
	Colour	
4.3	Materials	
4.4	Aesthetics	
5.0	Different styles of Interior Design	
6.0	Approach and Execution	
6.1	Analyzing the site and understanding the interior space	

6.2 Programming
6.3 Concept Development & Presentation
6.4 Design Development
6.5 Design Execution
6.6 Functional Criteria
7.0 Technology and Implementation

Instructional Methods:

Lectures, visits and comprehensive, interdisciplinary design exercise, supervision of project work

Assessment Methods:

- continuous assessment 40%
- Jury evaluation on projects (including external jury) 60%

Role of Instructor:

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of Students:

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Reference Books:

Interior design guide

Interior Spaces -Space' Light• Materials	Christian Schittich (Ed.)
Interior Surfaces and Materials	Christian Schittich (Ed.)
The codes guidebook for interiors 3rd Ed	Sharon K. Harmon, Katherine E.
The Fundamentals of Interior Architecture	John Coles/Naomi House
The interior design business handbook 3rd Ed	Mary V. Knackstedt, FASID, FIIDA
The Modern Interior	Penny Sparke

22.1.19. Course Title: ARCHITECTURE OF THE FUTURE

Course Number: Arch 692

Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)

Prerequisite: Arch 542 [Architectural design IV]

Year and Semester:

Instructor:

Academic Year:

Course Description:

The course aims to introduce students to the temporal dimension of architecture and highlights architecture and the future. Students will explore the trends in demographics, economics and society and propose architectural designs that mediate these future conditions.

Course Objectives:

On completion of this course students should be able to:

1. Understand trends in society and in Ethiopia, determine future development of architecture.
2. Explore futuristic architecture compared to contemporary architecture that responds to the challenges of time/space and landscape transformation.

Course Outline: Open

Instructional Methods:

Lectures, Seminars, exercises, Student's Architectural Design Presentations,

Assessment Methods:

Evaluation of exercises (design projects), written examinations

Role of Instructor:

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of Students:

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Reference Books:

Designing the future — Jacque Fresco

The Future Envelope-A Multidisciplinary Approach — Ulrich Knaack & Tillmann Klein

22.1.20. Course Title: ADVANCED URBAN DESIGN

Course Number: Arch 693

Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)

Prerequisite: Arch 443 [Urban design]

Year and Semester:

Instructor:

Academic Year:

Course Description:

Focusing on the inner-city areas, students in this course will have an opportunity to model and render alternative scenarios of building height and massing changes, open space design, street wall and pedestrian environment design, according to different building typology choices, development guidelines and regulations, and/or historic preservation and affordable housing incentives that the students themselves devise. The course will explore the impacts of these scenarios on Addis Ababa's skyline, on important view corridors, and on the experience of being in the public realm.

Course Objectives:

This course will be offered in close consultation with urban design and planning staff of the Addis Ababa City Administration, to explore the potential improvements and impacts of increased mixed-use and housing development in central city neighborhoods.

Course Outline: Open

Instructional Methods:

Lectures, visits and comprehensive, interdisciplinary design exercise, supervision of project work

Assessment Methods:

- continuous assessment 40%
- Jury evaluation on projects (including external jury) 60%

Role of Instructor:

Students are expected to attend at least 75% of the course

Role of Students:

Reference Books:

22.1.21. Course Title: RESTORATION & PRESERVATION

Course Number: Arch 694
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 681 [A coordinated design project IV]
Year and Semester:
Instructor:
Academic Year:

Course Description:

The course aims at introducing students to the field of historic preservation, specifically focusing upon the areas of preservation and restoration of historic buildings. Through classroom instruction and laboratory experience, students gain relevant knowledge and skill in the use of theory, practice and applied learning to solve preservation issues and problems.

Course Objectives:

Course Outline: Open

Weeks Topic Remarks

- Introduction
  - Why Preservation Historic Buildings
- The Process
  - Health and Life Safety
  - Building Pathology; Investigation, analysis and Assessment
- Building Materials
  - Wood
  - Masonry
  - Concrete
  - Architectural Metals
- Building Fabric
  - Roofing
  - Exterior Wall Cladding
  - Windows
  - Entrances and Porches
  - Store Fronts
- Building Ornamentals and finishes
  - Floors
  - Walls and Ceilings
  - Art and Stained Glass
  - Wood Carving and Millwork
  - Decorative and Flat Plaster
  - Protective and Decorative Finishes
- Special topics
  - Heating, Ventilation, and Air-Conditioning Systems
  - Building Service Systems
  - Lighting and Electrical Systems
  - Sustainability

Instructional Methods:
Assessment Methods:
Role of Instructor:
Role of Students:
Reference Books:

Preserving the Built Heritage — J. Mark Schuster
Historic Preservation Technology — Robert A Young, PE, Leed

22.1.22. Course Title: ADVANCED LANDSCAPE ARCHITECTURE

Course Number: Arch 695
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 445 [Landscape architecture]
Year and Semester:
Instructor:
Academic Year:

Course Description:

Focusing on the inner-city areas, students in this course will have an opportunity to model and render alternative scenarios of building height and massing changes, open space design, street wall and pedestrian environment design, according to different building typology choices, development guidelines and regulations, and/or historic preservation and affordable housing incentives that the students themselves devise. The course will explore the impacts of these scenarios on Addis Ababa's skyline, on important view corridors, and on the experience of being in the public realm.

Course Objectives:

This course will be offered in close consultation with urban design and planning staff of the Addis Ababa City Administration, to explore the potential improvements and impacts of increased mixed-use and housing development in central city neighbourhoods.

Course Outline: Open

Instructional Methods:
Assessment Methods:
Role of Instructor:
Role of Students:
Reference Books:

22.1.23. Course Title: Theory of Architectural Practice

Course Number: Arch 512
Credit Hour: 2 Cr. Hr
Prerequisite: None

Course Description

The main objective of the course is to introduce students to the Professional practice of architecture. It prepares and equips students with legal principles related to architectural practice and professional codes of conduct in the building industry. It introduces and familiarizes students with quantity surveying, cost calculation, specifying and bill of quantity preparation

Course Objectives (Outcomes)

1 To familiarize students with building codes, local rules and regulations that should be integrated and respected in their designs in order to process building permit license and to respect laws
2 Recognize how the architectural design process affects or is affected by political, legal, social, cultural, economic, and ethical dimensions.
3 Integrate theoretical principles with practical knowledge in the field of architecture and as practicing architects
4 Familiarize students with the laws and regulations that govern the practice

Course list

1. Applying building codes, standards and regulations to design and construction of buildings
2. Employment of the architect
2.1 Freelancing
2.2 Consultancy
2.3 Architecture as a career path
3. Contract Procedure for architectural services
3.1 form of agreement
3.2 legal terms in contractual agreements
4. The architect and relationship with other stakeholders in the building industry
4.1 Contractors, owners, consultants, municipal bodies, experts, other professionals, clients….
4.2 The architect as leader of projects and team working
5. Quantity surveying, cost estimation Specification of materials and bill of quantity preparation

Assignments:
a) Applying Ethiopian Building codes and standards to design and construction projects
b) Contract procedure , agreement forms

Seminar: Employment options of the architect
Exercise: specification writing and quantity surveying
Instructional methods Lectures, Exercises, Seminars
Assessment methods Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students Students are expected to attend all classes, do assignments, collect and incorporate feedbacks and participate in course activities. Students will work on both individual and collaborative projects during and outside of class time. Students will present work in class and participate in peer critiques.

Text Book
Becoming an Architect: A Guide to Careers in Design
By Lee W. Waldrep;
John Wiley (2006)
Architects guide to running a job
By Ronald Green.
Architectural Press; 6th edition (2001)
The Architect in Practice
By David Chappell, and J.Andrew Willis;
Blackwell Publishing; 9Rev edition (2005)
Sustainable practice in the built environment
By Craig Langston.
Butterworth-Heinemann; 2nd edition (2001)
References
Evaluation Scheme
Assignments and quizzes 40%
Mid-term 20%
Final Examination 40%

22.1.24. Architectural Practice & Management

Course Number: Arch 611
Credit Hour: 2 Cr. Hr
Prerequisite: None
Course Description
The purpose of the course is to discuss the organization, management and practice of the architectural profession including discussions on ethics and professional judgment, leadership as well as legal and regulatory issues.

1 Define and discuss architectural practice as it relates to firm organization and management
2 Discuss concepts related to running a practice including financial planning, management systems, and risk management strategies.
3 Define and discuss Architect's Project Management Roles and how to implement project cost control measures on typical architectural projects
4 4. Define and discuss Ethics and Professional Judgment as they relate to contemporary architectural practice
5 5. Define and discuss Legal Rights and Responsibilities in relation to architectural practice

Course Contents
1. Running an architectural office
- Office structure
- Team work
- Procuring services
- Financial planning
2. Supervision and contract administration of construction projects, ethics and professional judgment
3. Architects as project managers
4. The concept, components and duties of Construction Management
5. Funding of construction projects, property valuation

Assignments :
a) the legal context in practice
b) Architectural practice around the world
c) Applying codes of ethics in everyday practice
Lectures, Exercises, Seminars

Exercise evaluation, written examination, Seminar evaluation
Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.
Students are expected to attend all classes, do assignments, collect and incorporate feedbacks and participate in course activities. Students will work on both individual and collaborative projects during and outside of class time. Students will present work in class and participate in peer critiques.
The Architect's Handbook of Professional Practice (14th Student Edition) edited
by J. Demkin, editor. 2002, John Wiley & Sons
Ethics and the Practice of Architecture by B. Wasserman, P. Sullivan and
G. Palermo; 2000, John Wiley and Sons. ISBN 0-471-29822-0 (pbk)
Building Codes Illustrated: A Guide to
Understanding the 2006 International Building
Code (Building Codes Illustrated)
by Francis D. K. Ching, Steven R., FAIA,PE Winkel
Wiley; 2nd edition (2006)
Assignments and quizzes 40%
Mid-term 20%
Final Examination 40%

22.1.25. Course Title: BACHELOR THESIS
Course Number: *Arch 443*
Credit Hour: **12(Lect. 0Hrs, Studio 12Hrs)**
Prerequisite: All modules

Course Description

The thesis project is a comprehensive architectural design project, which necessitates the co-ordination of other fields in the building design process. It comprises program preparation and design of buildings containing spatial, functional and social aspect. A research paper will be produced which includes a complete construction document (drawing and written documents).
The thesis seminar is conceived to offer a special platform of support by lecturers and exchange between students during the thesis project. The theme of the course is how to do handle design projects from initial stage to final stage independently and through research with minimum guidance of instructors.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Demonstrate coherent architectural designs that integrate a knowledge of the ways that analysis, research, context, budget,
2. Understand the social, political, economic and professional context, the regulatory frameworks, and health and safety considerations that guide design and building construction
3. Apply architectural histories and theories of physical, artistic and cultural contexts, and their use in informing the design process
4. Know how to critically appraise design inputs to ensure that the design response is appropriate to site and context with consideration for sustainability and budget.
5. Know the regulatory requirements, including the needs of the disabled, health and safety legislation and building regulations and development control, that guide building construction
6. Develop an appropriate philosophical approach which reveals an understanding of theory in a cultural context and the ability to Generate and systematically test, analyze and appraise design options, and draw conclusions which display methodological and theoretical rigor.

Semester Project:

- The project should be complex enough that allows application of all skill, knowledge and attitude grasped in the five years and is researchable.

Week	Studio Activity	Home Activity
1	Discussion on the course syllabus •	**Project Selection** **2 Project Synopsis** o Brief Description o Rationale o Benefit
2	**Project Selection** **2 Project Synopsis** o Brief Description o Rationale o Benefit	**Research** • Literature Review • Precedence Review
3	**Research** • Literature Review • Precedence Review	**Site Selection** • Site Requirements • Master Plan • Service/Population Standard
4	**Site Selection** • Site Requirements • Master Plan • Service/Population Standard	**Design Program Development** • Functional Requirements • Space Standards
5	**Design Program Development** • Functional Requirements • Space Standards	**Proposal Finalization** • Project Synopsis • Literature Review • Project Site • Design Program
6	**Proposal Jury & Presentation**	**Proposal Jury & Presentation**
7	**Proposal Jury & Presentation**	**Design Development** • Site Analysis • Concept Development • Form & Function Study
8	**Design Development** • Site Analysis	**Consultation** • Site Analysis

	• Concept Development • Form & Function Study Site Planning	• Site Adaptation • Site Planning
9	**Consultation** • Site Analysis • Site Adaptation • Site Planning	**Consultation** • Zone Diagram • Bubble Diagram • Schematic Diagram
10	**Consultation** • Zone Diagram • Bubble Diagram • Schematic Diagram	**Consultation** • Spatial Configuration • Form & Façade • Structural System
11	**Consultation** • Spatial Configuration • Form & Façade • Structural System	**Preliminary Design** • Site & Floor Plans • Sections • Form
12	**Intermediate Presentation & Jury**	**Intermediate Presentation & Jury**
13	**Intermediate Presentation & Jury**	• Incorporation of intermediate jury comments
14	• Incorporation of intermediate jury comments	• Incorporation of intermediate jury comments
15	• Incorporation of intermediate jury comments	• Final Design Preparation
16	**Presentation & Jury**	**Presentation & Jury -**

Instructional methods

Comprehensive detailed design exercise, supervision of project work and design processes, lectures, seminars, studio presentations, external criticism, Excursion

Assessment methods

Jury evaluation on projects (including external jury), seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Concerned Design Book

Evaluation Scheme

Project work	70%
Presentation	30%

22.1.26. Course Title: BUILDING MATERIALS & CONSTRUCTION I

Course Number: Arch 252

Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)

Prerequisite: None

Course Description

This course is designed to equip the students with the theoretical and practical understanding of basic principles in architecture related to materials, structure, construction and general technology. It introduces students to common building materials that are naturally occurring and man-made while giving awareness and appreciation in the use of local materials for building construction. The composition, production and properties of different building materials will be also be discussed in length. Basic structural systems such as columns, beams, load bearing and non-load bearing structures as well as individual building components will be introduced. Under the topic of finishing works and materials (ceiling, paint, tiling...) different terms and materials used , how they are constructed, accessories involved... will be explained illustrating different methods of joining parts, sequential construction process, and tools and instruments involved. The application of construction chemicals that enhance specific performances such as water proofing, healing and sealing chemicals will also be discussed. The course concludes with discussion on the challenges and constraints when selecting different building materials.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1 Understand the origin and characteristics of common building materials, the composition and properties of building materials.
2 Know about the preparation and production of the materials commonly used in Ethiopia: Stone, earth, wood, cement, lime, mortar, and sand, concrete.
3 know basic structural elements and force systems in buildings, identify types of foundation, reasons behind structural failures
4 Know about new innovations in building materials, the need for constructing chemicals
5 Differentiate finishing works and a variety of finishing materials like paints, tiles etc.
6 Handle and use common hand tools, equipment and materials properly

Course contents

1. Common building materials
1.1. Naturally occurring
1.2. Man-made
2. Common Building materials composition, production and properties
2.1. soil based building materials
2.2. stone based
2.3. plant based
2.4. cement based
2.5. ferrous materials
2.6. glass
2.7. polymers
2.8. fabrics
3. Structural forces, structure for architects
3.1. load bearing and non-load bearing structures
3.2. Basic structural elements in buildings: columns and beams
4. Understanding individual Building components
4.1. sub-structure: foundation types, structural failures
4.2. superstructure: load bearing and non-load bearing parts of a building
5. fishing materials

5.1. ceiling
5.2. paint
5.3. tiling
5.4. plastering works
6. Construction chemicals
6.1. performance enhancing, admixtures
6.2. water proofing
6.3. healing
6.4. sealing
7. Construction tools and equipments
7.1. handling and using common hand tools
7.2. construction equipments
7.3. construction machinery
8. challenges and constraints when choosing building materials

Individual and group work exercises

Assignments

Topics;

a) illustrating different parts of a building, differentiating between load bearing and non-load bearing parts
b) world famous structures made of one material
c) Finishing materials; use, application, comparative advantage, relative price, durability, unique character..

Seminars

Topics;

a) discussion on unique building materials
b) comparative advantage/disadvantages of commonly used building materials in Ethiopia

Exercises:

How to handle and use common hand-tools
Demonstration of different building materials
Videos on production of different building materials, their assembly...
Site visit to building material production or assembly plants

Instructional methods Lectures, Exercises, Seminars, Workshops
Assessment methods Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Fundamentals of Building Construction: Materials and Methods by Edward Allen and Joseph Iano, Wiley; 2009 ISBN-10: 0471219037, ISBN-13: 978-0471219033

References

Materials, Structures, and Standards: All the Details Architects Need to Know But Can Never Find, (2006) Julia Mc Morrough ISBN-13: 978-1592531936

Evaluation Scheme

Assignments and exercises	35%
Quizzes	15%
Final Examination	40%

22.1.27. Course Title: BUILDING MATERIALS & CONSTRUCTION II

Course Number: Arch 351
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 252

Course Description

This course is designed to equip students with the theoretical and practical understanding of variety of building materials and their application/ use giving emphasis on their properties and performance. In the exercise sessions detail drawings especially at connection points and drawing symbols on plans will be covered. During seminar sessions students will be guided to develop effective oral and written communication skills necessary for individual or group work reporting and presentations. As the most commonly used construction material, concrete will be discussed in detail from production to application and use. In parallel terms such as formwork and scaffolding will be discussed. Prefabrication and working with modular construction, the challenges and merits will be covered. The course will also introduce how to observe safety precautions and safe practices in construction work sites or in the use of tools and equipment to minimize accidents on site, ensure welfare of site workers, public safety. The course concludes by discussing the issue of design with climate which will cover topics such as site planning, orientation of buildings shading devices...for maximum output as a response to different climatic needs. Challenges with different climate conditions, the use of different building materials for human comfort, building performance analysis and energy efficiency for climate adopted buildings will be covered.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1 Know properties of common building materials , their application in construction of basic elements of buildings
2 Understand and be able to produce working drawings and special detail drawings.
3 Know everything about concrete from production or mix to application
4 Understand the benefits of prefabrication and modular co-ordination, resource efficiency, sustainability in design, construction and f buildings, new technologies in construction, modern scaffoldings.
5 Practice safety measures on construction sites and in the use of tools, equipment and machineries.
6 Critical View of the of building material choices and their performance and common construction practices
7 Compare the merits and demerits of materials used for buildings in different climatic conditions, understand the idea of passive design, energy efficiency and sustainable design

Course Contents

1. Old and new building materials
1.1. local and international practices with
1.1.1. Adobe, mud blocks, Adobe, Mud blocks,
1.1.2. Bamboo, reeds…
1.1.3. Stone, brick & concrete…
1.1.4. Polymers, alloys
1.2. materials and their performance
2. Working with construction details
2.1. Connecting different materials
2.2. Connection details
2.3. Limitations with certain materials
2.4. Specific and special construction details
2.5. Moisture, sound, pollution, temperature challenges and construction details to tackle problems
3. Concrete
3.1. constituents
3.2. mixing
3.3. application and curing
3.4. Advanced concrete technology, admixtures, light weight concrete...
4. Working with modular construction
4.1- Prefabrication, standard sizes of different building materials and construction (HCB, Brick, masonry construction…
4.2. resource efficiency, speed/construction, minimizing waste
4.3. challenges with pre-fabrication and installation especially in Ethiopian context
5. Formwork (Forms for foundations, columns, beams walls etc...) and modern scaffoldings.
Types, Uses, Application, availability
6. Safety in construction
6.1. Planning for pollution free, safe, construction environment
6.2. Hazard free Construction execution
6.3. common accidents during construction
6.4. Common construction accidents in Ethiopia; causes, effects
7. Design with climate
7.1. orientation, opening size, sun/wind breakers, insulation materials
7.2. Site planning and development, temperature, humidity , wind, optimum site locations, sun path diagrams, sun protection, types of shading devices, design responses to energy conservation strategies
7.3. challenges with different climate conditions
7.4. Energy efficient buildings
7.4.1. Climate adopted building
- balancing all aspects of energy, lighting, space conditioning and ventilation by providing a mix of passive solar design strategies
- Principles of passive heating and passive cooling
7.4.2. Cross and Stack Ventilation
7.4.3. Courtyards, roof ponds, cool pools, wind catchers,
7.5. the concept of green buildings

Individual and group work exercisesAssignments (individual)
Topics:
a)building materials performance (critical analysis)
b) local experiences with prefab construction
c) architectural design solutions to climatic challenges
Exercise: drawing symbols, detail and construction drawings (min. G+0 building)
It is highly recommended to take students to actual construction sites (at different stages)
Seminar:
Topics:
a) Construction practice in Ethiopia
b) Building material choice for specific functions e.g. Cinema, office, bar, public spaces...
Group work:
Topics:
a) Designing a simple structure complete with construction technique, working drawing and design report. Representative models to be presented showing how different materials are connected in reality.
b)design in different climates of Ethiopia; use of construction materials, design in response to (1) hot/dry, (2) temperate and (3) cold type of climate categories
Instructional methods Lectures, Exercises, Seminars, Workshops
Assessment methods Report writing, Exercise evaluation, written examination, Seminar evaluation
Role of instructor
Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.
Text Book
Fundamentals of Building Construction: Materials and Methods by Edward Allen and Joseph Iano, Wiley; 2009
ISBN-10: 0471219037, ISBN-13: 978-0471219033
Lechner, Norbert. Heating, Cooling, Lighting: Design Methods for Architects. New York, NY: John Wiley & Sons, 2000. ISBN: 9780471241430.

References
Building Design and Construction Handbook, 5th Edition. Merritt, Frederick & Ricketts, Jonathan, (2000), ISBN-13: 978-0070415966
Concrete Masonry Handbook For Architects, Engineers, Builders by James A. Farny, J. M. Melander and W. C. Panarese, Portland Cement Assn; 6 edition (March 14, 2008) ISBN-10: 0893122602 ISBN-13: 978-0893122607
Evaluation Scheme

Assignments, , Exercises , report writing	35%
Quizzes	15%
Final Examination	40%

22.1.28. Course Title: BUILDING MATERIALS & CONSTRUCTION III

Course Number:Arch 352
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 351

Course Description
This course is designed to equip students with the theoretical and practical understanding of basic construction materials and systems of construction related to substructure and superstructure. It explains the building system and different constructions systems and technologies. It will also give emphasis on different parts of a building such as the exterior envelope (skin of a building), interior partitions (space plan), mechanical devices and in-built fixtures and furniture and their performance requirements. In exercise sessions there will be interactive discussions and hands on practice on preparation of complete set of working drawings for simple and complex buildings.

Course Objectives (Outcomes)
On completion of this course students should be able to:

1 Understand of basic components of a building and the different systems of construction
2 Understand function of building parts such as openings, walls...., sound and thermal insulation, moisture movement, damp-proofing and means of vertical circulation.
3 Prepare working drawings and construction details as per required standards
4 Principles of exterior envelope design for a wide variety of enclosures with an emphasis on the energy performance
5 Have an understanding of collaboration with other disciplines and giving provisions for electrical, sanitary and mechanical systems
6 Solve construction and building material related problems with alternate materials or with additional details

Course Contents
1. The building component
1.1. substructure
1.1.1. foundation or sub-grade structures; foundations, retaining walls, basement floors
1.1.2. types
1.1.3. challenges with moisture and soil type
1.1.4. working with sloppy sites
1.1.5. slope calculations for basement parking
1.2. Superstructure
1.2.1 Concrete structures: solid & ribbed slab, suspended slabs, precast and cast-in situ parts...
1.2.2. Vertical circulation: stairs, elevators, escalators and ramps
1.2.3. the idea behind light weight structures; steel structures, space truss applications, tensile structures
1.2.4. exposed structural elements as beauty
2. Exterior envelope
2.1 load bearing and non-load bearing walls
2.2. types of exterior walls; curtain walls, solid walls, panels, wooden walls, stone walls, truss framed glass...
2.3. exterior envelope and giving attention for orientation and micro-climate
3. Interior partitions
3.1. Materials and properties and: panels, glass, gypsum, agro stone, magnesium board, collapsible partitions...
3.2. Performance and comparative advantage; function, price, aesthetics...
4. Mechanical devices
4.1. human comfort
4.2. thermal insulation
4.3. sound insulation
4.4. Kitchen air suckers, air conditioning...

5. In built fixtures and furniture

Assignments , exercises and seminars Assignments;

Topics

a) report writing about an iconic light weight structure; steel, glass or tensile structure

b) moisture preventive methods for underground construction works

c) critical analysis of interior partition material options

Seminars;

Topics

a) comparison of different construction systems

b) working with glass as an exterior envelope

Exercise/project; preparing a full working drawing for simple and complex buildings (> G+0 building) ; foundation plans, floor plans, sectional elevations, elevations, reflected ceiling plans, window door schedules, additional details…

It is highly recommended for students to visit real projects to have a better understanding of building material performance, mechanical systems other construction and building related issues.

Group work;

Topic

a) Working on construction details for different parts of a building; roof, wall, floor slab, window and door....

b) observation and reporting on exterior envelope material choices and performance of selected buildings in Addis Ababa

Instructional methods Lectures, Exercises, Seminars, Workshops

Assessment methods Exercise evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Building Construction Illustrated, (2008) By Ching, Francis ISBN-13: 978-0470087817

References

Up, Down, Across: Elevators, Escalators and Moving Sidewalks Alisa Goetz, (2003) ISBN-13: 978-1858942131

Evaluation Scheme

Assignments, exercise, reports	35%
Quizzes	15%
Final Examination	40%

22.1.29. Course Title: ARCHITECTURAL SCIENCE I (Electrical)

Course Number:Arch 471
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: PHYS 205
Course Description
This course introduces the basics of electrical installation in the context of architectural design with an emphasis on lighting. The students shall be able to deal with the parameters of electrical wiring and to incorporate them into their design practice. They shall be able to understand the technical terminology to enable them to collaborate with the engineers.
Course Objectives (Outcomes)
On completion of this course students should be able to:

1. Have a basic understanding of electrical circuits.
2. Have a basic understanding of generation and distribution systems, lighting & power demand calculation methods,
3. Design electrical installation systems and complete electrical installations for a small building.

Instructional methods
Lectures, Exercises
Assessment methods
Exercise evaluation, written examination, Seminar evaluation
Role of instructor
Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book
Mullin, RC. 2004. Electrical Wiring Residential: Based on the 2005 National Electric Code, 15th ed. Delmar Cengage Learning, 4th Ed., 2007.
References
Mullin, RC and RL Smith. 2008. Electrical Wiring Commercial, 13th ed. Delmar Cengage Learning. ISBN-10 1418064041.
National Electric Code 2008 (National Fire Protection Association National Electrical Code). 2007. Delmar Cengage Learning.
Home Improvement, Black and Decker, 2009
Simplified Design of Bldg. Lighting by Schiler ISBN-13: 978-0471192107

Evaluation Scheme

Homework and quizzes	20%
Mid-term	30%
Final Examination	50%

Course contents
Course Content
Chapter One: Electrical Systems Overview
Chapter Two: Electricity Basics: Definitions & Key Concepts
Chapter Three: Generation & Distribution system
3.1 Overview of Generation system
3.2 Overview of Distribution System
Chapter Four: Calculations and Designs of lighting Scheme
4.1. Lighting Schemes
4.2 Design of lighting scheme
4.3 Allowable illumination levels

4.4 Calculation Methods of Lighting Scheme
Chapter five: Electrical Installation Design
5.1 Terminology and definitions
5.2 Design procedure
5.3 Branch Circuit Design Guidelines-Residential
5.4 Feeder Capacity
5.5 Choosing Cable Size
5.6 Design electrical installation systems
Assessment methods
Exercise evaluation, written examination, Project evaluation
Role of students
Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

1. Mullin, RC. 2004. Electrical Wiring Residential: Based on the 2005 National Electric Code, 15th ed. Delmar Cengage Learning, 4th Ed., 2007.

References

1. Mullin, RC and RL Smith. 2008. Electrical Wiring Commercial, 13th ed. Delmar Cengage Learning. ISBN-10 1418064041.
2. National Electric Code 2008 (National Fire Protection Association National Electrical Code). 2007. Delmar Cengage Learning.
3. Home Improvement, Black and Decker, 2009
4. Simplified Design of Bldg. Lighting by Schiler ISBN-13: 978-0471192107

Evaluation Scheme

Homework and quizzes	20
Mid-term	30%
Final Examination	50%

22.1.30. Course Title: ARCHITECTURAL SCIENCE II (Water, heating, cooling, ventilation)

Course Number:Arch 571
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: PHYS 205
Course Description
The course aims to introduce students to the basics of technical installation of water systems and heating, cooling and ventilation systems in the context of architectural design. Students shall learn to deal with the parameters of these systems and to incorporate them into their design practice. They shall also learn the technical terminology to enable them to collaborate with the engineers.

Course Objectives (Outcomes)
On completion of this course students should be able to:

1. Understand water supply systems, sources, quality quantity, treatment and storage and installation of sanitary fixtures.
2. Understand drainage work above and below ground, treatment and storage, storm water drainage and collection, treatment and disposal of refuse.
3. Know the basics of active and passive heating, ventilation and cooling systems

Instructional methods
Lectures, Exercises
Assessment methods
Exercise evaluation, written examination, Seminar evaluation
Role of instructor
Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.
Text Book
Plumbing Technology: Design and Installation by Lee Smith and Michael A Joyce, Delmar Cengage Learning; 004 edition (June 27, 2007) ISBN-10: 1418050911 ISBN-13: 978-1418050917
Bathroom Basics, P. Galvin, 1997

Reference
Plumbing : Design and Installation, (2006) L. V. Ripka ISBN-13: 978-0826906311
Air Conditioning Principles and Systems, (2001) by Edward G. Pita ISBN-13: 978-0130928726
Heating, Cooling, Lighting: Design Methods for Architects, Norbert Lechner, (2008), ISBN-13: 978-0470048092
Evaluation Scheme

Homework and quizzes	20%
Mid-term	30%
Final Examination	50%

Course contents

Part-I: Water Supply, Sewerage & Drainage system

1. water supply systems
2. Water sources, quality quantity
3. Water treatment and storage
4. installation of sanitary fixtures
5. Collection and disposal of sewage
6. Drainage work above and below ground,
7. Storm water drainage
8. Collection treatment and
9. Disposal of refuse
10. Complete sanitary installation for a small building.

Part-II: Heating, cooling and Ventilation System

11. Climatic elements and climatic zones,
12. Factors affecting -microclimate,
13. Principles of heat & heat transfer,
14. Bio-climatic comfort & passive design approach,
15. Sun style
16. Thermal insulation : Thermal principles
17. Insulated double skin facade
18. Composite wall
19. Insulated Panels
20. Acoustic screen and partition
21. Global roof
22. Sun breaker roofing
23. Green roofs
24. Photovoltaic roofing
25. Insulated double skin roof
26. Waterproof membrane roof
27. Insulated panels
28. Global floor
29. Basic concepts
30. Acoustic principles
31. Hydrothermal principle
32. Ventilated façade
33. Ventilation & air conditioning
34. Complete Heating, cooling and Ventilation installation for a small building.

22.1.31. Course Title: ARCHITECTURAL SCIENCE III (Lighting, acoustics)

Course Number:Arch 572
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: PHYS 205
Course Description
This course introduces the basics of technical installation lights and acoustics systems in an architectural design. Students will study the important role lighting system plays in architectural design. Also, the students shall be able to deal with the parameters of acoustics incorporating them into their design practice. They shall be able to understand the technical terminology to enable them to collaborate with the other engineering professionals.
Course Objectives (Outcomes)
On completion of this course students should be able to:

1. Understand the scientific principles of light in relation to design of buildings including natural and artificial lighting, light and glare and light in architecture.
2. Understand calculation methods for lighting building interiors.
3. Understand the acoustics principles of sound production , frequency and loudness, reflection, absorption, transmission and diffraction and hearing sensitivity,
4. Do noise reduction calculations for architectural acoustics.
5. Control noise in buildings using sound insulation and isolation, room acoustics, pattern of distribution of sound in an enclosure, sound reinforcement, auditorium space design
6. Use criteria for speech and music.

Instructional methods
Lectures, Exercises
Assessment methods
Exercise evaluation, written examination, Seminar evaluation
Role of instructor
Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.
Text Book
Architectural Lighting Design, (2008) Steffy, ISBN-13: 978-0470112496
Acoustic Design (Architectural Press Library of Design and Detailing), Duncan, Templeton, David Saunders, ISBN-13: 978-0442308469
Reference
Acoustical Design of Concert Halls and Theatres : A Personal Account Vilhelm Jordan, (1980), ISBN-13: 978-0853348535
Acoustical Designing in Architecture, V. Knudsen, C. Harris, (1980), ISBN-13: 978-0883182673
Evaluation Scheme

Homework and quizzes	20%
Mid-term	30%
Final Examination	50%

Course Contents

Par-I: Light in architecture

1. Scientific principles of light in relation to design
2. Natural & artificial lighting,
3. Light & glare,
4. Light in architecture,
5. Day light factor and calculation methods for building interiors

Part-II: Acoustic

6. Principles of sound production & propagation,
7. Principles of sound Frequency & loudness,
8. Principles of sound Reflection & absorption,
9. Principles of sound Transmission & diffraction,
10. Hearing sensitivity,
11. Changes in sound level & noise
12. Reduction calculations
13. Controlling noise in buildings,
14. Sound insulation & isolation,
15. Room acoustics,
16. Pattern of distribution of sound in an enclosure,
17. Sound reinforcement,
18. Auditorium space design criteria for speech & music.

Course Title: APPROPRIATE BUILDING TECHNOLOGY
Course Number:Arch 562
Credit Hour: 3(Lect. 2Hrs, Studio 3Hrs)
Prerequisite: Arch 355
Course Description
The aim of the course is to raise the student's awareness of appropriate building technologies, crafts and materials in design a sustainable building. The course is made for learning from biological and ecological system functioning and using ecological principles as a working model for sustainable design, for reviewing the challenges and argues for a deeper look into and beyond green design making the case that a critical element in the change to design a sustainable future. It basically focus on architectural design and the building structures and materials connected to their site and natural place in order to capture, store, and distribute the natural site energies, the neighborhood scale, and local climate conditions.
Course Objectives (Outcomes)
On completion of this course students should be able to:
1. Appropriate building technology: analysis, objective, target population.
2. Design and construction of earth materials, bamboo, and fiber reinforced concrete, solar energy, wind energy, waste management, water consumption and indoor environment quality etc.
3. Construct an actual model building using experimental materials.
Instructional methods
Lectures, Exercises, Laboratory, Workshops
Assessment methods
Exercise evaluation, written examination, Seminar evaluation
Role of instructor
Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.
Role of students
Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.
Text Book
Architecture, technology and process by Chris Abel, (2004)
ISBN-13: 978-0750637923
References
New architecture and technology by Gyula Sebestyebe, Christopher Polington, (2003)
ISBN-13: 978-0750651646
Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

The course outline

1. Sustainable Design
1. What do mean by sustainable?
2. Design Matters in sustainability, Why Architects?
3. Green Design versus Sustainable Design, Why Now?
4. Approaching Sustainability
5. Place-Based Energy and Resources
6. Principles for Designing Sustainability, Where to Start?
2. The Architectural Design & Ecological Model
1. What is Ecology?
2. Ecology as a Model
3. Thinking as a System: Connectivity, Not Fragmentation
4. The Site: Challenges and Opportunities
5. Site Design and Environmental Analysis
6. Sustainable Infrastructure
7. The Skin
8. Evolving a Sustainable Design Practice
9. Sustainable Design and Existing Buildings
10. Sustainable Interior Architecture
3. Healthy, safe and secure buildings
1. Detail design and human factors
2. Healthy environments
3. Safe environments
4. Secure environments
5. Fire protection
6. Conflicting demands and risk limitation
4. Technological innovation
1. Technological advancement
2. Innovation in building
3. The development of new products
4. Gradual innovation
5. A return to familiar techniques
5. Product selection
1. The specification of building products
2. Selection criteria
3. Searching for product information
4. Specifying design determinant
5. Specification substitution
6. The building and the process: Planning for life
1. Feasibility
2. Town planning and development control
3. Planning permission
4. Concern for detail

4.1. Structure and fabric
4.2. Materials and services
4.3. Joints and connections
4.4. Internal and external finishes
4.5. An environmental model
4.6. Environmental impact

22.1.32. Course Title: LOW-COST STRATEGIES IN DESIGN

Course Number:Arch 661
Credit Hour: 2(Lect. 1Hrs, Studio 3Hrs)
Prerequisite: Arch 482

Course Description

The aim of the course is to teach and train low- cost strategies in design. Students shall become able to adopt in their design projects tools based on international and especially Ethiopian expert knowledge. Special consideration will be given to the field of low cost housing. The course will enable the students in designing a building towards higher efficiency levels, low impacts on the site and surrounding areas, increasing durability, and enhancing the quality of life for the occupant, as well as the local community.

Course Objectives (Outcomes)

On completion of this course students should be able to:

1. Emphasis Ethiopian urban/rural context cost minimization, affordability,
2. Understand the value of material selection, flexibility, user selection and effective construction technologies.

Instructional methods

Lectures, Exercises, Laboratory, Workshops

Assessment methods

Project evaluation, written examination, Seminar evaluation

Role of instructor

Offer lectures, advise students, offer projects, consult students, give assignments, evaluate students' performance, and provide feedback to students.

Role of students

Attend classes, consult projects, self-study, do assignments, present presentations, collect and incorporate feedbacks.

Text Book

Architecture Design procedure By Arthur Thompson, (1998)

ISBN-13: 978-0340719411

Evaluation Scheme

Project work	30%
Mid-term	30%
Final Examination	40%

Course Outline

1. Innovative design
2. Design &Location Linkages
1. The placement of homes
2. Orient building to maximize natural day lighting
3. Place openings to provide good natural ventilation
3. Sustainable Sites: The use of the entire property on the site
4. Water Efficiency
1. Water efficient practices, both indoors and outdoors
2. Install water-efficient toilets and fixtures
3. Design water-efficient landscapes
4. Use permeable paving materials
5. Energy & Atmosphere
1. Energy efficiency in the building's envelope
2. Energy efficiency in heating and cooling design
3. Energy efficiency in install whole-house fans or ceiling fans
4. Select energy star appliances
5. Install high R-value insulation
6. Improvement of indoor air quality
7. Vent range hood to the outside
6. Materials & Resources: Efficient utilization of materials,
1. Selection of environmentally preferable materials,
2. The minimization of waste during construction
3. Use engineered wood for headers, joists, and sheathing
4. Use recycled-content insulation, drywall, and carpet

22.2. Course outlies for suportive courses

22.2.1. Course Title: Mathematics I

Course Number: MATH 203

Credit Hour: 4

Prerequisite: None

Course Description:

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

Course Objectives:

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

- Explain the basic concepts of logic, sets and matrices.
- Explain the concept of function.
- Apply the graphs of linear quadratic, logarithmic and exponential functions.
- Analyze the system of linear equations of 2x2 and 3x3.
- Analyze the system of linear inequalities of 2x2 and 3x3.
- Solve linear programming problems of smaller inequalities.
- Apply the methods and principles obtained to solve problems in the study of information science.
- Apply the graphs in application software.

Course Contents:

Chapter 1: LOGIC, SETS AND SET OPERATION

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

Chapter 2: FUNCTIONS AND GRAPHS

2.1. Concept of a function
2.2. Combination and composition of functions
2.3. Linear function and its graph
2.4. Definition and properties of linear function

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

Chapter 3: MATRIX

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

Chapter 4: SYSTEM OF LINEAR EQUATIONS

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

Chapter 5: COMPLEX NUMBER

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

Chapter 6: ELEMENTARY COUNTING PRINCIPLES

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

Teaching Method:

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

Assessment:

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

Text Book:

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

References:

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

22.2.1.1. Course Title: Mathematics II

Course Number: MATH 204

Credit Hour: 4

Prerequisite: Mathematics I

Course Description:

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

Course Objectives:

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

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

Chapter 1: Introduction to Limit and Continuity

1.1. Limits of functions
  1.1.1. Definition of limits
  1.1.2. Properties of limits and limit theorems
  1.1.3. One –sides limits
  1.1.4. Infinite limits and limits at infinity
  1.1.5. Two important limits

1.2. Continuity
  1.2.1. Continuous functions
  1.2.2. Properties of continuous functions

Chapter 2: Introduction and Application of Differential Calculus

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

Chapter 3: Differential Calculus of Function of Two Variables

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

Chapter 4: Introduction and Application of Integral Calculus

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

Chapter 5: Sequence and Series

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

Teaching Method:

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

Assessment:

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

Text Book:

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

Additional References:

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

22.2.1.2. Course Title: Civic and Ethical Education

Course Code: CEED 201

Credit Hours: 3

Prerequisite: None

Course Description:

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

Course Objectives:

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

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

Course Objectives

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

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

Course Contents

Chapter 1. The Context of Civic Education to enhance empowerment

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

Chapter 2. Historical survey on State Formation

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

Chapter 3. Citizenship and Civic Participation

3.1 What do we understand by the terms " Citizen" and " Citizenship"?
3.2 The legal and social basis of citizenship
3.3 The role of the citizen
3.4 Responsibility of the citizen
3.5 Rights of the citizen

3.6 A rational for civic participation

Chapter 4. Democracy and Democratic Government

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

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

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

Chapter 6. Democratic Elections and Citizen's Participation

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

Method of Teaching

Lectures, Assignment, class works, and group discussions

Assessment:

- Continuous Assessments(quizzes, tests, assignments, class activities, class attendances. etc) 60%
- Final Exam 40%

Total 100%

Text Book:

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

References:

1. Gorge, D and Kalaer, H. (1993) An introduction to Business Ethics.
2. Matt, C. et al. (1991). Challenges of Citizenship.
3. Palmer, D. (1996). Does the center hold? An introduction to Western Philosophy. (chapter 7, Ethics, chapter 8, Critique of Traditional Ethical Theories: chapter 9 Political and Social Philosophy).
4. Boss, A. and Boss (1998). Perspective on ethics. London: Mayfield Publishing.
5. Kassaye, A. (2001), Fundamentals of Civic and Ethical Education. Aurum, A. and Popkin, H.(1996) introduction to Philosophy (Chapter 4 & Chapter 5)

22.2.1.3. Course Title: Introduction to Philosophy (Logic)

Course Number: Phil 201
Credit Hours: 3
Prerequisite: None

Course Description:

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

Course Objectives:

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

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

Course Content:

Chapter 1: Basic Concepts

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

Chapter 2: Meanings and Definitions

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

Chapter 3: Informal Fallacies

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

Chapter 4: Categorical Propositions

4.1. Components of categorical proposition
4.2. Quality, quantity and distribution

4.3. Venn Diagrams and the Modern Square of Opposition
4.4. Conversion, Obversion& contraposition
4.5. Traditional Square of Opposition

Chapter 5: Categorical Syllogisms

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

Method of Teaching:

Lecture, reading assignment with presentation, seminar, tutorial

Assessment:

- Attendance and class participation 5%
- Quiz #1 and #2 20%
- Test15%
- Individual Assignment #1 and #2 20%:
- Final exam 40%

Text Book:

1. Hurely. A concise Introduction to Logic 10th edition, 2008.
2. Irving M. Copi et al, Introduction to Logic, 13th edition, 2009.
3. Brooke Noel Moore and Richard Parker, Critical Thinking, 6th Edition, 2001.

References:

1. Being Logical: A Guide to Good Thinking, D. McInerny, 2005

22.2.1.4. Course Title: Basic writing skills

Course Code: FLEN201
Credit Hours: 3 Lectures + 1 Language Lab
Prerequisites: None
Course Description:
This is an intermediate English course that provides students with the knowledge and skills to create grammatically correct and meaningful sentences. During lectures and within the Language Lab, students are given the opportunity to expand and practice their English language ability through speaking, listening, reading and writing activities. Textbook activities are provided to formalize and expand students' knowledge.
The course proceeds to paragraph writing and gives an introduction to basic essay writing. Attention is given to the reading of textbooks and everyday English materials. Students are also provided the opportunity to study spoken English and focus on pronunciation and fluidity.

Course Objectives:

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

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

Course Content:

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

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

Texts:

Primary Text:

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

Secondary Text:

1. Bucsemi, S.V. and Smith, C. (2007). 75 Readings: Anthology. 10th edition. New York: McGraw-Hill.
2. Boardman, C.A. and Frydenberg, J (2002). Writing to communicate: paragraphs and essays. 2nd edition. New York: Pearson
3. Fleming, L., (2005). Reading for results, 9th edition. New York: Houghton Mifflin.
4. Kennedy, X.J., Kennedy D.M. and Aaron, J.E. (2003). The brief Bedford Reader, 8th Edition. New York: Bedford.

5. Lebauer, R.S. (1988). Learn to Listen; Listen to Learn- an advanced ESL-EFL Lecture Comprehension and Note Taking text book. New Jersey: Prince Hall.

6. Level, B. (2001). Writing and Grammar: Communication in Action, New Jersey: Prentice Hall,
7. Wyrick, J., (2005) Steps to writing well, 6th Edition,

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

Evaluation Modalities:

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

Grade Specifics:

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

22.2.1.5. Course Title: English for Communication I

Course Code: FLEN202
Credit Hours: 3 Lectures + 1 Language Lab
Prerequisites: FLEN201 Basic Writing Skills

Course Description:

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

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

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

Course Objectives:

After completing the course students will be able to:

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

Course Content:

1. Planning and writing essays
   - 1.1 Narrative, persuasive, expository and descriptive,
   - 1.2 Information mapping,
     - 1.2.1 topic,
     - 1.2.2 subtopics,
     - 1.2.3 topic sentences,
     - 1.2.4 thesis statement.
   - 1.3 Developing sentences using transitional words,
   - 1.4 Introductions, body paragraphs, conclusion.
2. Writing direct and indirect quotations.
3. Writing informal, formal and business letters.
4. Editing and writing
   - 4.1 email messages and memos,
   - 4.2 summaries,
   - 4.3 research reports,
   - 4.4 and proposals.
5. Introducing business communication
6. Paraphrasing texts and summarizing audio and written texts.
7. Reading exercises
   - 7.1 Reading for details,
   - 7.2 Reading for gist,
   - 7.3 Reading for specific purposes.

8. Listening exercises
   8.1 Oral answers for oral questions
   8.2 Written answers for oral questions
   8.3 Listening exercises for lecture note taking
9. Group presentation of a research paper
   9.1 Printed document (1000 words)
   9.2 Oral presentation
10. Language Lab
    10.1 Road to IELTS 4: writing 1 and 2
    10.2 BBC Learning English
        10.2.1 General and business English
        10.2.2 Talking business
        10.2.3 Presentations
    10.3 Study skills success (intermediate and advanced)
    10.4 Typing skills (using the software in the language lab)

Texts:

Primary Text:

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

Secondary Text:

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

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

Evaluation Modalities:

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

Grade Specifics:

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

22.2.1.6. Course Title: English for Communication II

Course Code: FLEN301
Credit Hours: 3 Lectures + 1 Language Lab
Prerequisites: FLEN202 English for Communication I

Course Description:

This course provides students with the skills for effective communication specifically concentrating on public speaking, proposal writing and group activities. Through student-centered learning approach students will be provided the opportunity to practice audience and purpose identification, speech planning, use of visual aids and persuasive performance.
Students will give presentations of varying lengths, conduct research, and write proposals relevant to their field of study and present research using audio visual equipment. They will also conduct group meetings in which they negotiate issues, apply critical thinking to decision-making, deal with conflict respectfully and use English conversational conventions.
Participants will also be allowed the opportunity to develop specific business skills vital for their future employment including creating their resume and preparing for job interviews.

Course Objectives:

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

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

Course Content:

11. Basics of English communication
    - 11.1 Philosophy, meaning, significance and styles of communication
    - 11.2 Communication skills: receptive and productive
    - 11.3 Critical analysis and discussion of famous speeches
12. Audience-centered approach to communication
    - 12.1 Audience analysis
    - 12.2 Purpose identification: inform or persuade
13. Developing presentations
    - 13.1 Preparation: gathering, sorting and selecting information
    - 13.2 Using informational or persuasive strategies to fit purpose
    - 13.3 Short speeches
14. Final presentation preparation
    - 14.1 Editing for purpose, audience and time
    - 14.2 Outlining and creating presentation notes
    - 14.3 Audio Visual Aids
    - 14.4 Rehearsing: memorization, timing, visual aids, technology, feedback

15. Speech delivery
    - 15.1 Vocal characteristics: volume, tone, pitch, pronunciation and articulation
    - 15.2 Non-verbal characteristics:
        - 15.2.1 eye contact,
        - 15.2.2 expressions,
        - 15.2.3 posture, movement and gestures
    - 15.3 Maintaining audience focus
16. Working within small groups
    - 16.1 Effective participation:
        - 16.1.1 conversation skills,
        - 16.1.2 rule-based structures,
        - 16.1.3 non-verbal communication.
    - 16.2 Leading groups, managing meetings, setting agendas
    - 16.3 Problem solving through negotiation, critical thinking and collaborative writing
    - 16.4 Group presentations
17. Research-based proposal
    - 17.1 Selecting and narrowing the topic
    - 17.2 Research, investigation and note-taking
    - 17.3 Developing the report
18. Employment skills
    - 18.1 Resume writing: planning, language and formatting
    - 18.2 Purposeful introductory letters
    - 18.3 Communication for job interviews

Texts:

Primary Texts:

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

Secondary Texts:

4. Shatzman, B.T. (2003). Business Communication Today. 7th edition. New Jersey: Prentice Hall.
5. Thill, J.V. and Povee, C.L. (2005). Excellence in Business Communication. 6th edition. New York: Prentice Hall.
6. Zarefsky, D. (2002). Public Speaking Strategies for success. Boston: Prentice Hall.
7. Ober, S. (2000). Contemporary Business Communication. 4th edition. Boston: Houghton Mifflin.
8. Guffey, M.E. (2004). Essentials of business communication. 6th edition. Ohio: Thomson South-Western
9. Baker, W.H. (2007). Writing and Speaking for Business.

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

Evaluation Modalities:

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

Grade Specifics:

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

22.2.1.7. Course Title: General Psychology

Course Code: PSYC 201

Credit Hours: 3

Prerequisites: None

Course Description:

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

Course Objectives:

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

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

Course Contents:

Chapter 1 Introduction

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

Chapter 2 Psychology of Adolescence

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

Chapter 3 Theories of Intelligence

3.1 Growth of intelligence
3.2 Measurement of intelligence

Chapter 4 Personality Development

4.1 Personality characteristics
4.2 Basic Assumption about people
4.3 Basic Traits

4.4 Basic human needs
4.5 Personality measurement
4.6 Motives
4.7 Relationships and conflicts

Chapter 5 Leadership Philosophy

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

Chapter 6 Vocational Adjustment

6.1 Employee selection methods
6.2 Job analysis
6.3 6.3 Worker characteristics

Chapter 7 Psychological Measurement

7.1 Kinds of measurement
7.2 Tests

Method of Teaching

Lectures, Assignment, class works, and group discussions

Assessment:

- Continuous Assessments(quizzes, tests, assignments, class activities, etc) 60%
- Final Exam 40%

Total 100%

Text Book:

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

References:

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

22.2.1.8. Course Title: Leadership Skills

Course Code: MAEN441

Credit Hours: 3

Prerequisites: None

Course Description:

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

Course Objectives:

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

Course Content:

Chapter 1: Introduction

1.1. Definition of Leadership
1.2. Description of Leadership

Chapter 2: Approaches to Leadership

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

Chapter 3: Theories of Leadership

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

Chapter 4: Types of Leadership

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

Chapter 5: Other Contemporary issues of Leadership

5.1. Women Leadership

5.2. Culture and Leadership

Teaching Methods:

Lecture, Discussions, Demonstrations and Presentations.

Assessment:

- Continuous Assessment:
  - (Leadership activities) 20%
  - Leadership Self- Assessment 20%
  - Tests and Quizes 30%
- Final Examination 30%

Total 100%

Text Books:

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

References:

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

22.2.1.9. Course Title: Organizational Behaviour

Course Number: MAEN 422
Credit Hour: 3
Prerequisite: None

Course Description:

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

Course Objectives:

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

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

Chapter 1: Introduction

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

Chapter 2: The Individual in an Organization

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

Chapter 3: The Group in an organization

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

Chapter 4: The Organization System

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

Method of Teaching

Lectures, Assignments, Class group discussions, projects works

Assessment:

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

Textbook:

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

References:

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

22.2.1.10. 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
- Apply information technology to assist you in other coursework
- Use the internet for communications, research
- Use traditional and nontraditional ways to find and share information
- Create, edit and share pictures
- Creating online and paper publications and graphics using computers
- Understand ethical and responsible use of computer technology

Course content

Chapter 1: Introduction to computer systems

1.1 Components of a computer
Input, processing, output, memory, storage
1.2 What are networks and the Internet?
1.3 How to use the Windows operating systems
Starting and stopping
Desktop
Windows, menus, scroll boxes, icons
Using the keyboard and mouse
Using folders and files
1.4 Brief introduction to College IT services
1.5 Brief introduction to use of Word and Excel

Chapter 2. Using the Internet

2.1 Internet ethics
2.2 Sources of academic information
2.2.1. E-books
2.2.2. Journals
2.2.3. Encyclopedias

2.2.4. Newspapers
2.3 Web Searches
2.4 Referencing web pages
2.5 Managing e-mail
2.5.1. Sending
2.5.2. Receiving
2.5.3 Filing

Chapter 3. Using Word Processing

3.1 How to write a research paper
3.2 Windows, ribbons and toolbars
3.3 Document settings and styles
3.4 Text editing
3.5 Page layout
3.6 Typing skills
3.7 Tables
3.8 Headers and footers, footnotes

Chapter 4. Using spreadsheets

4.1 What is a spreadsheet?
4.2 Worksheet window
4.3 Menus and toolbars
4.4 Entering text and numbers
4.5 Doing calculations
4.6 Using formulas and functions
4.7 What IF analysis and goal seeking
4.8 Formatting
4.9 Graphics
4.10 Printing

Chapter 5. Making presentations

5.1 How to make good presentation materials
5.2 What is presentation software
5.3 Presentation window
5.3.1. Ribbon
5.3.2. Toolbars
5.3.3. Themes
5.4 Creating slides
5.4.1. Templates
5.4.2. Formatting
5.4.3. Transition between slides
5.4.4. Review
5.5 Inserting clip art and photographs
5.6 Arranging slides and saving

Chapter 6. Elective Projects

6.1 Using a database
6.2 Photo editing
6.3 Drawing using 2-d and 3-d CAD applications
6.4 Using MatLab

Instructional Methods

The class meets in a computer lab and follows the pattern: half-hour lecture, one-hour directed computer work, ¼ hour typing practice, and one-hour supervised practice time.

Textbook

- Shelly Gary B. et al. 2007. Microsoft 2007: Introductory Concepts and Techniques, Windows XP Edition. 1224 p. ISBN-10 141884327X

References

1 Advanced Excel for scientific data analysis by Robert de Levie, 2004
2 Microsoft Office XP, Marianne Fox et al., 2002
3 Beginning Open Office 3 from Novice to Professional by Andy Chanelle, 2009

Evaluation Scheme

Test I …….	20%
Test II …….	20%
Project work ……	20%
Final exam ……..	40%
Total ……	100%

22.2.1.11. Course Title: Introduction to Business Management

Course Number:MAEN 222, same as MARK 222

Credit Hour: 3

Prerequisite: None

Course Description

This course focuses on the basic concepts and principles of management, the functions of planning, organizing, staffing, directing and controlling and their relationships to key issues in management practices, such as leadership and motivation. Nature and role of supervisory management, functions of supervisor and labor relations, inspection and effective communication are also discussed. Students will work in teams to improve their business proficiency by developing a marketing plan, based on all this semester's courses, and understand the role marketing plays in business and business management.

Course Objectives

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

- develop a marketing plan
- explain the characteristics of management
- identify the evolution of management theories and practices
- define management functions i.e. planning, organizing, leading and controlling
- distinguish organization, theories of organizations and organizational structures
- apply the fundamentals of staffing, leadership theories and practices in the process of management.

Course Content:

Chapter 1: Management: An Overview

1.1. Definition of Management and managers
1.2. Managerial Functions
1.3. Significance of Management
1.4. Levels of Management
1.5. Managerial Roles
1.6. Managerial Skills and their Relative Importance
1.7. Management: Science or Art?
1.8. Universality of Management

Chapter 2: Evolution and development of management thought

2.1. Management in Antiquity and Pioneer Contributors
2.2. Early Management Pioneers (Contributors)
2.3. Management Thought
2.2.1. Major pre classical contributors
2.2.2. Classical Management Theory
2.2.3. Administrative management theory
2.2.4. Behavioral Management Theory
2.2.5. Modern approaches to management

Chapter 3: The planning function

3.1. Meaning, nature and importance of planning

3.2. Organizational objectives

3.3. The Planning Process

3.4. Types of Plans

3.5. Managerial decision-making

3.5.1. Decision-Making Conditions

3.5.2. Types of Decisions

Chapter 4: The Organizing Function

4.1. An Overview of Organizing
4.2. The Organizing Process
4.3. Importance of Organizing
4.4. Types of Organizations
4.5. Major Elements of the Organizing Function
4.6. Departmentalization: Meaning and Bases
4.7. Delegation of authority
4.8. Centralization and decentralization
4.9. Authority relations in organization (line, staff, functional)
4.10. Span of management
4.11. Organizational structure

Chapter 5: Staffing the organization

5.1. Human Resource Management as strategic Partner

5.2. Personnel Planning and Recruitment

5.3. Selecting Employees

5.4. Orientation and Training

5.5. Other topics in Human Resource Management

Chapter 6: Directing Function

6.1. Meaning and the Need for Leadership

6.2. The need for leadership

6.3. Leadership theories

6.3.1. Trait Theory

6.3.2. Behavioral Theories

6.3.3. The Contingency /Situational Leadership Theory

6.4. Leadership styles

6.5. Motivation

6.6. Communication in Organizations

Chapter 7: Controlling Function

7.1. Definition and Importance of controlling

7.2. The Controlling Process

7.3. Types of Controlling

7.4. Cybernetic and Non-cybernetic Controls

7.5. Over-control Vs Under-control

Teaching method

The course will be delivered through lectures, presentations, group and individual assignments.

Text Book:

Burrow, J. et al., Business Principles and Management, 2007. ISBN-10:0538444681

References:

1. Rue Leslie W. and Byars Lloyd L. (2001).Business management: Rea-World Applications and Connections.
2. Schermerhorn John R. Management (2005) . Management 8th ed. John Wily & Sons .Inc. ISBN –O-471-45476-1
3. Certo Samvel C. & Certo S. Trevis (2009) Modern Concepts & Skills Management 11th ed. Prentice Hall . ISBN-978—0-13.
4. Griffin (2005) Management . ISBN 0-618-35459X. Houghton Mifflin Company
5. Understanding Business, 3rd ed. Nickels (1993)

Evaluation Scheme:

Assignments	10%
Tests and quizzes	20%
Presentations	10%
Project work	20%
Final Exam	40%

22.2.1.12. COURSE TITLE: APPLIED PHYSICS

COURSE NUMBER: PHYS 201 RESPONSIBILITY: CROSSCUTTING
CREDIT HOUR: 3
PREREQUSITE: CO-PREREQUSITE WITH MATHEMATICS I

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

Course Objectives:
After completing this course, students should be able to:

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

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

Reference

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

Teaching Methods
Lectures, demonstrations and class discussion
Supervised laboratory exercises
Assignments and lab reports

Assessment/Evaluation

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

Specific Competencies
Ability to apply physical concepts for logically and critically analysis
Have an active curiosity and eagerness to learn
Ability to use a logical approach in trouble shooting and solving problems

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

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