SAINT MONICA UNIVERSITY HIGHER INSTITUTE - BUEA

AGRICULTURE
Academic Catalog

(Programs, Policies Manual)

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SCHOOL OF SCIENCE AND TECHNOLOGY (SST)

The School of science and Technology offers programs which enable students to directly use principles acquired to enhance the society. The programs are geared towards making the students, not only apply existing principles, but also to be innovative.

1.1 GOALS AND OBJECTIVES
The main objectives of the School of Science and Technology are:
1. Establish a School of Science and Technology of the first rank in Cameroon.
2. Instill in its students the confidence and competence required to meet the challenges associated with careers in science and Technology.
3. Produce competitive Agriculturist who have negotiated a well-balanced curriculum based on regional and national accreditation guidelines.
4. Bridge the already existing agricultural gap in Cameroon by providing quality skilled and innovative agriculturist.
5. Train agriculturist to be all round perfect so as to solve the agricultural value chain problems in our society which were previously solved by expatriates.

6. Support excellence in agricultural research and evidence-based practice through collaboration, consultation, and partnerships with faculty, students, and other practicing professionals.

The School of Science and Technology awards amongst others, a Bachelor of Science in Agriculture – options in Agricultural Economics and Agribusiness; Agronomy and Animal Sciences.
The Department of Agriculture in addition to a BSc in Agriculture, also offers, a Postgraduate Diploma in Agricultural Economics & Agribusiness and an MSc in Agricultural Economics and Agribusiness.

2.0 THE UNDERGRADUATE (BSc Agriculture) PROGRAMME

2.1 Philosophy of the programme
The philosophy of the Bachelor of Science in Agriculture Degree Programme is to create the missing link required for development of an agro-based industrial sector through the provision of agricultural related programmes.

2.2. Aims and Objectives
The BSc programme is expected to achieve the following objectives: to;
✓ Provide graduates that are adequately skilled and equipped to engage in agricultural production in a farming environment
✓ Assist Cameroon in its efforts to achieve self-sufficiency in production of basic food and agricultural raw materials for human needs and industrial growth respectively.
✓ Develop new patterns of agricultural management through improved agricultural leadership, characterized by ability to innovate and increase reliance on the use of modern business techniques in agricultural production and marketing.
✓ Enhance rural employment opportunities and attendant improvement in the quality of life of the rural dwellers.
✓ Put into practice the knowledge and skills gained in the training by engaging in profitable farming activities after leaving school.

Generally, the courses in agriculture are meant to provide the students with thorough knowledge and skills in plant and animal production, the economics of farm management and farm mechanization. Provide the students with a research background in all areas of agriculture that will prepare them for gainful private practice, employment in the private and public sectors or to further studies in any

institution of higher learning. Give students practical skills in key areas of agriculture as well as transferable skills that addresses family and community needs in the surroundings and the nation. The programme is designed such that at Post graduate level, students can concentrate in one of the following specialties: Agronomy, Animal Sciences or Agricultural Economics/Agribusiness and Extension.

2.3 Career Prospects
- Becoming agricultural economists and project analysts
- Farm Managers
- Soil and plant scientists
- Conservation planners
- Commercial horticulturalists
- Creating business start-ups
- Engage in development works in communities etc

3.0 ADMISSION AND GRADUATION REQUIREMENTS

3.1 Basic Admission Requirements
The details of the requirements for undergraduate degree programmes are given below:

3.1.1 Direct entry requirements

Holders of GCE A/L passes in any two of Chemistry, Biology, Geography, Mathematics, Physics, Geology, Economics may be admitted to level 200. Non science background GCE A/L holders may be admitted in level 100 to do preliminary courses.

3.1.2 Top up entry requirement

Students who have passed the HND in the relevant agriculture divisions are qualified for admission as top up students in level 400.

3.1.3 Duration of Programme / Maximum Residency
The duration for undergraduate degree programmes is four (04) years for direct entry students and a minimum of one (01) for top up students depending on a review of transcript from previous higher institution were HND or higher certificate was obtained.
The maximum residency for undergraduate programmes is one and half times the normal duration of the programme

3.2 Minimum Requirements for Graduation

To be eligible for the award of a Bachelors degree, a student must have satisfied the following requirements:

- ✓ Must have spent not less than 4 years (direct entry) and at least one year (01) for top up on the programme depending on the point of entry.

- ✓ Must have passed all the University compulsory courses.

- ✓ Must have also passed all the departmental core courses and their required electives.

- ✓ Must have completed an acceptable project work and present a project report.

- ✓ Must have a CGPA of not less than 1.00 at the end of the programme.

4.0 COURSE UNIT SYSTEM AND REGULATIONS GOVERNING AWARD OF DEGREE

4.1. **Description of Course Unit System**

The course unit system is an operational system in which the entire programme of courses required by a student consist of a prescribed number of units. Thus, the student's workload in a semester is defined in terms of units where one unit represents one hour lecture or one hour of tutorials or four hours of practical work per week, throughout the semester, normally of fifteen weeks duration or as otherwise approved by the University management board.

4.2. Registration of Courses

Registration of courses is normally at the beginning of a semester. A student is expected to report in the department and get a list of prescribed courses (Form B) for the programme being offered. The student is expected to complete the departmental registration forms provided and fulfill all other registration formalities required and proceed to ICT for registration. The print out should be submitted to the department. Registration is considered to be completed only after the forms are duly endorsed and submitted. Registration by proxy is not allowed. Students who fail to register for a course would not be allowed to write examinations for that course(s). Each student is given an adviser whose duty is to monitor the student's academic progress and advise him/her appropriately as to how many units he or she should register for in each semester.

4.2.1 Withdrawal from a Course

A student may withdraw from a course for which he/she is registered without incurring the penalty of a grade of "F" for the course only by using the ADD and DELETE form.

4.2.2 Continuous Assessment

This is the feature of the course unit system which makes it unique. It provides for a continuous evaluation of the students academic performance in a given course. The evaluation may take the form of take-home assignments, tutorials, class tests and quizzes, reports and/or such other means as may be appropriate and consistent with the objective and conduct of the course as determined by the department offering the course. An assessment of the performance in tests, tutorials, etc will be used in determining the students overall grade in the course and constitutes 40% of the overall grade.

4.3 Terminologies

In order to understand the operation of the course unit system, a number of terms are defined and/or explained.

✓ Pre-requisite Course: This is a course that must be taken and passed by a student before he/or she can move to the next level of the same course. The pre-requisite course thus forms a sort of foundation for the higher level courses. For example, a course like MTH 101 may be specified as a pre-requisite to a course MTH 104 or MTH 201.

✓ Compulsory Course: It is one which must be registered for and passed by a student before he can be awarded a degree of the institution.

✓ An Elective Course: This is a course that must be taken to satisfy college or departmental requirements for a degree. The course may or may not be offered by the students department. Usually, such an elective course will be one of a set of courses which the department deems

fit to include in its curriculum and the student is free to choose a specified number from a set. In short the student has an option.

- ✓ A Free Elective: This may be defined as a course voluntarily offered by a student either to satisfy the requirement for a minimum number of units for full time studentship or because the student just likes the course. Such an elective may be a course being offered by any department in the Institution.

- ✓ Audited Course: This is a course which a student attends with the permission of the course lecturer, but it is not examined on. Such a course will not count towards fulfilling the requirements for a degree. Students do not register for this course.

4.4. Examination and Grading Under the Course Unit System

The issue of examination is a logical follow up of the discussion of registration and continuous assessment under the course unit system. The institution has a set of examination regulations which will eventually be made available to students. It is important however to note the following:

4.4.1 **Pattern of examination**: Each course shall be examined at the end of the semester in which it is offered. This shall normally be by theory paper of two or three hours, in addition to which there may be a practical paper and/or an oral examination.

4.4.2 **Measurement of performance**: A student's performance in a course shall be measured in terms of :

- ✓ The scores in the continuous evaluation (40%)

- ✓ The results of the prescribed theory and/pr practical examination in the course (60%).

4.4.3 **Level of performance**: The grades awarded for a course are as follows:

Table 1: Grades awarded for a course

Percentage Score (%)	Letter Grade	Grade Point (GP)	Interpretation
70-100	A	5	Excellent
60-69	B	4	Very Good
50-59	C	3	Good
45-49	D	2	Satisfactory
40-44	E	1	Pass
0-39	F	0	Fail

4.4.4 **Semester performance**

A student's performance in any semester is determined by means of a semester grade point average (GPA). This involves the awarding of credit points in respect of each course taken during the semester. Numerical values attached to the letter grades are shown in Table 1. The semester GPA is then obtained as the ratio of the total number of credit points earned (TPE) to the total number of credit units carried (TCC) of courses offered during the semester. Thus GPA=TPE/TCC

4.4.5 Cumulative Performance

While the GPA specified above is used to measure the performance of a student in a given semester, the cumulative GPA (CGPA) is the one that really determines the student's overall academic standing and therefore, his continued stay or otherwise in the Institution after semester examination. It is also the GPA used to classify the degrees awarded to students. The CGPA is obtained as the ratio of all the credit points accumulated since entering the institution to the total number of credit units registered for since coming into the institution. In other words, the CGPA is equal to the cumulative credit points earned divided by the cumulative credit units earned (CCC). Thus, CGPA = CPE/CCC (Table 2).

Table 2: Grading of scores and Grade Point Calculations

i) Credit Unit	ii) Percentage score (%)	iii) Letter grade	iv) Grade point (GP)	v) Interpretation	vi) Grade Point Average (GPA)	vii) Cumulative Grade point Average (CGPA)
Vary according to contact hours assigned to each course per week, per semester and according to student workload	70-100	A	5	Excellent	Derived by multiplying i) and iv) and dividing by total credit unit	Derived by multiplying i) and iv) and dividing by total credit units of courses registered.
	60-69	B	4	Very Good		
	50-59	C	3	Good		
	45-49	D	2	Satisfactory		
	40-44	E	1	Pass		
	0-39	F	0	Fail		

4.4.6 Simple computation of GPA and CGPA

To illustrate the computation of GPA and CGPA, consider the following results obtained by a student in his/her first year in the Institution

Table 3: Computation of GPA and CGPAs

FIRST SEMESTER					SECOND SEMESTER				
Course Code	Credit Units	Grades	Credit Points	Credit Points Earned	Course Code	Credit Units	Grades	Credit Points	Credit Points Earned
GEN 1011	2	A	5	10	AGEX 2042	6	A	5	30
GEN 1031	2	C	3	6	ANS 2052	6	C	3	18
GEN 1301	4	B	4	16	GEN 2302	3	B	4	12
GEN 2501	4	A	5	20	AGR 2062	6	B	4	24
GEN 1401	6	F	0	0	AGRI 2072	6	C	3	18
AGR 2011	6	C	3	18	GEN 1202	3	F	0	0
AGR 2021	6	B	4	24	AGRI 2092	6	C	3	18
AGR 2031	6	B	4	24	AGRI 2132	4	D	2	8
Total	36			118	Total	40			120
TPE	118	CPE = 118		= 118	TPE	120	CPE = 118+120		238
TCC	36	CCC = 36			TCC	40	CCC= 36+40		76
GPA	TPE/TCC	118/36 3.3		3.3	CGPA	CPE/CCC	238/76		3.1

Remarks: Repeat GEN 1401   Repeat GEN 1202

Note: This student is expected to repeat GEN 1401 and GEN 1202 in the first and second semester of next session.

4.5 **Probation, Withdrawals and Re-admission**

- ✓ A student with a CGPA of between 0.7 and less than 1.00 at the end of the session shall be placed on academic probation during the subsequent semester.

- ✓ A first year student with a GPA of less than 0.5 at the end of the first semester shall be required to withdraw from the programme

- ✓ A student with a CGPA of less than 1.00 in one session after probation shall be required to withdraw from the programme

- ✓ A student who has exhausted his/her maximum residency for the programme shal be required to withdraw from the programme

- ✓ A student who fails to register for two consecutive semesters shall be deemed to have voluntarily withdrawn from the programme.

✓ In the approved cases of withdrawals, re-admissions must be sought with 05 consecutive semesters from the date of withdrawal. Re-admitted students will start at the level the withdrawal was done.

4.6 **Repetition of Courses**

Any course failed by a student must be repeated until passed unless otherwise stated by the regulations. A student may repeat only those courses in which he has obtained a grade of F. The grade earned for a repeated course shall be recorded and used in the computation of the GPA and CGPA in the usual way.

4.7 **Classification of Degree**

The degree awarded by the institution are classified according to CGPA as follows:

Table 4: Classification of Degree based on CGPA

S/N	Cumulative Grade Point Average (CGPA)	Class
1	4.50-5.00	First class
2	3.50-4.49	Second Class Upper Division
3	2.40-3.49	Second Class Lower Division
4	1.50-2.39	Third Class
5	1.00-1.49	Fail

5.0 EXAMINATION SCHEDULES AND ADMISSION OF CANDIDATES TO EXAMINATION RULES

5.1. **Examination Dates**

Course examinations shall be scheduled at the end of the semester in which the course is taught and on dates approved by senate.

5.2 **Examination Materials**

The registrar shall supply on request by the Dean of the school all required examination materials at least 4 weeks before the commencement of examination.

5.3 **Time table**

The institution shall publish the schedule of examination dates and time on notice boards not later than 4 weeks to the commencement of examinations. Examination timetable may not be altered except with the approval of senate.

5.4 **Length of Semester Examination**

The length of any written course examination shall lie between 2-3 hours. This restriction shall not apply to practical examination or field work.

5.5 **Examination Venues**

All institution examinations shall be held in halls, rooms or spaces approved by the examination board of the school in accordance with the framework of guidelines laid down by senate.

5.6 Sitting Arrangement

Candidates must be seated sufficiently far apart and students taking identical papers should not sit together. All candidate must be visible to the invigilator(s). each candidate shall have his/her number written on the space allocated to the candidate.

5.7 Conditions for admission into any Examination

In order to be admitted to any examination of the institution, a candidate must:

- ✓ Be duly register for the course

- ✓ Follow the approved course of study for a prescribed period

- ✓ Pay all fees prescribed by senate

- ✓ Satisfy institution attendance requirement shall be 75% and satisfactory completion of course work, practical, assignment, projects or other matters. Such requirements must be made known to the students at the commencement of the relevant course; and

- ✓ Candidates shall be required to show their identity cards before being admitted into the examination hall.

5.8 List of Candidates

The registrar shall publish a list of all the candidates registered for each examination. It shall be the responsibility of each student to ensure that he is registered for the appropriate examinations ad that he knows the dates, times and venues of the examination for which he is registered.

6.0 REGISTRATION REGULATIONS

i) No student should procure or complete registration forms on behalf of another student. That is, no registration by proxy.

ii) Students are expected to register a minimum of 36 credits and a maximum of 48 credit units.

iii) Only the institution senate shall grant permission to qualified students for registration of courses above the maximum number of credit units

iv) Only final year students are eligible to register 03 extra credit units on the approval of the institution senate.

v) No student should connive to secure or back date receipt for payment of later registration fee for the purpose of procuring late registration forms.

vi) All registration forms collected should be returned within the stipulated time

vii) A student may withdraw from a course he/she has registered by filling and submitting the add and drop forms to avoid the penalty of incurring a grade of F for the course

viii) Return of add and drop forms must not exceed three weeks after the commencement of lectures

ix) Photocopying of registration forms for whatever reason shall not be allowed, and cases of missing registration forms shall not be entertained as well.

x) Students shall write their names in full while completing the registration form

xi) Students are expected to register their lower level courses before registering their current (higher) level courses

xii) Students not registered for any course are not eligible to sit for that examination

xiii) Students should endeavour to register for courses mounted in their departments in that department before bringing the information to the department for recording keeping purpose

xiv) Only duly registered students are eligible to be issued examination cards.

7.0 ELIGIBILITY FOR STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME

Only students who have reached 400 level are eligible for this programme. Eligible students must have completed first semester of 400 level. Such students must have 70% of the minimum cumulative credit earned at the current level after second semester of 300 level to qualify for industrial work experience. This can be derived as follows

Students current CCE after 2nd semester of 300 level x 100

Maximum available CCE (after 2nd semester of 300 level)

8.0 UNDERGRADUATE PROGRAMS

Generally, every undergraduate student requires at least 180 credits to earn a bachelor's degree in SST. Each program is divided in to three categories of courses – for the sake of emphasis; this applies to all the programs in the school.
- General Education Courses
- Core Courses
- Concentration Courses
- Practical Courses

8.1 GENERAL EDUCATION COURSES

All SMHI undergraduate students are expected to take the General Education Courses (General University Requirements) irrespective of their majors. As an American-style liberal arts and sciences university, all our graduates must earn at least 40 credits in the form of General Education Courses. In order to meet the General Education requirements for graduation, these 40 credits must come from four principal areas – Arts, languages, Humanities, Social Sciences and Sciences. These General Education credits can either be earned on campus or transferred from other institutions or programs.

The General Education Courses will be taken during the first two years of undergraduate studies at SMHI (Freshmen/women and Sophomore Years). Students bringing in about 30 or more credits should be able to complete the General Education requirements within one year. Those who don't complete these General Education requirements within the first year will be required to take compulsory summer sessions so as to complete the remaining credits.

8.1.1 Objective of General Education Courses

Experience has shown that people deal with work related challenges that may not necessarily emanate from their educational areas of specialty or concentration. Hence, the purpose of General Education

Courses in SMHI is to open students to a variety of work related issues in the fields of Arts, Humanities, Social Sciences and Sciences, that may enable students to handle some problems that may arise from areas beyond students' areas of concentration and specialty. Therefore, general courses are like a light that enables the students to conveniently succeed in their careers.

The following constitute the 14 General Education Courses

Course Number	Course Title	Credits
GEN 1031	Sports & Physical Education	3
GEN 1102	Introduction to College Writing	3
GEN 1202	Introduction to French	3
GEN 1401	College Algebra	3
GEN 1501	Introduction to Science	3
GEN 2102	Foundation of Philosophy & Religion	3
GEN 2302	Computer Information System	3
GEN 1011	English Grammar & Composition	3
GEN 2501	Introduction to Social Sciences	3
GEN 4102	Business & Entrepreneurship	3
GEN 4201	Research Method & Statistical Analysis	3
TOTAL CREDITS		**33**

8.2 **General Courses Synopsis**

All General Education courses have a credit value of three (03) each. All general courses must be validated as they are one of the requirements for graduation. Therefore, they will be given either a passed or failed mark in the transcript of the student. The total credit unit for general courses is 33.

GEN 110: Introduction to College Writing
Course Description
This is a course about helping you develop as a writer, reviser, and researcher. It will emphasize the rhetorical and stylistic demands of college writing through focus on experiential, expressive, and analytic writing.
Course Objective
The main purpose of this course is to introduce students to the conventions of academic writing and critical thinking. Students are introduced to college/university-level writing, including multiple rhetorical contexts for essay development. Emphasis on thesis development, essay organization, argumentation, critical reading and clarity of expression and introduction to incorporating source material using the APA style.
Course Content
This includes learning the principles of writing and revising essays; adapting writing for an audience; finding, summarizing, analyzing, and synthesizing information from single and multiple texts; organizing information into a persuasive and coherent essay; understanding elements of style and grammar; and giving oral presentations that skillfully combine argument with the exposition of appropriate evidence. It will also include: The Writing Process; Brainstorming, gathering material, editing, and rewriting; Kinds of writing; The organization of an essay; Writing thesis statements and topic sentences; Writing supporting material; Writing from Research; Guidelines for personal experience essay; Gathering Data in the Library

GEN 101/102: Sports & Creative Arts
Course description
This is a unique course designed to encourage physical fitness and creativity in students. The course is divided into two parts, the first dealing with sports and the second with creative arts. In sports, students work individually and cooperatively in various theoretical and practical aspects of sports. It provides students of varying abilities with experiences that facilitate physical, social, intellectual, cultural, spiritual and emotional growth. Meanwhile, creative arts addresses the art-forms of visual arts, creative writing, music, drama and dance. Also designed to create an academic atmosphere in which students may develop their intellects and skills;
 Course Objective

Pupils will: acquire basic knowledge, skills and values through Performance, Composition and Two – Dimensional Art Activities such as picture making, print and pattern-making; develop skills in critical, independent thinking, reasoning and imagination; acquire skills in self-expression; appreciate products of artists/artistes and beauty in the environment. Sports will entail the following content: Current state of officiating; Officiating as a lifetime career; Officiating style; Goal setting; Communications skills; Decision Making skills and Mental Training Strategies.
Course Content:
Creative Arts are an integration of Visual Arts(drawing, weaving, modeling, casting, carving, painting etc.) Sewing and Performing Arts (music, dance and drama). Variety of rules of sports games; Officiating mechanics and techniques etc.

GEN 120: Introduction to French

Course Description
This course is designed for students with very little or no prior knowledge of French. The course provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations aimed at good pronunciation and ease in response.
Course Objective
Students who come prepared to class every day and who actively participate can expect to:
Learn about contemporary French and Francophone institutions and mores; communicate and interact with other speakers of French in diverse situations and in conversations involving everyday topics; develop listening skills and understand the gist of a variety of communication modes (TV, video, radio, etc.); read a broad range of printed materials for general, specific and practical information; write notes, letters and compositions on familiar topics with a good command of vocabulary and sentence structure in a cohesive and organized manner
Course Content
The focus of this class will be on real-life language use, the integration of French and Francophone culture and language, and the acquisition of the four skills: reading, listening, writing, and speaking. During class time, you should expect to engage in group and pair work, and to actively participate in class. Attendance, participation, and individual preparation outside of class are essential for success.

GEN 140: College Algebra

Course Description
This course is a functional approach to algebra that incorporates the use of appropriate technology. Emphasis will be placed on the study of functions, and their graphs, inequalities, and linear, quadratic, piece-wise defined, rational, polynomial, exponential, and logarithmic functions. A graphical approach will be utilized throughout, with an emphasis on solving application problems. Designed to examine, in detail, the applied, real-world, and theoretical mathematical implications of the mathematical concept of a function. ... Linear, Quadratic, Polynomial, Rational, Exponential, and Logarithmic functions will be studied.
Course Objectives
Review the number sets, exponents, and simplifying mathematical expressions; Demonstrate proficiency in solving one-variable linear and quadratic equations; Demonstrate proficiency in graphing linear and quadratic functions; Demonstrate familiarity with one-variable linear and absolute value inequalities; Demonstrate familiarity with the general aspects of functions; including their definition, notation, operations, and inverses; Demonstrate familiarity with Complex numbers and their arithmetic operations; Demonstrate proficiency in solving one-variable polynomial and rational equations; Demonstrate familiarity in graphing polynomial and rational functions; Demonstrate proficiency in solving exponential and logarithmic equations; Demonstrate proficiency in graphing exponential and logarithmic functions; Demonstrate proficiency in solving multi-variable systems of linear equations and inequalities; Demonstrate proficiency in matrix operations, properties, determinants and their application in solving systems of equations; Demonstrate familiarity with the introductory aspects of the two-variable equations and graphs of the conic sections; Demonstrate familiarity with the introductory aspects of sequences and series. (optional); Demonstrate familiarity

with the introductory aspects of combinatorics and probability theory,and mathematical induction. (optional)

Course Content

Real Numbers and Their Properties; Integral Exponents and Scientific Notation; Rational Exponents and Radicals; Polynomial and Rational Expressions, Complex Numbers; Equations in One Variable; Modeling to Solve Problems; Equations and Graphs. In Two Variables; Linear Equations in Two Variables; Scatter Diagrams and Curve; Fitting; Quadratic Equations; Linear and Absolute Value Inequalities; Functions; Graphs of Relations and Functions; Families of Functions, Transformations, and Symmetry; Operations with Functions, Inverse Functions, Constructing Functions with Variation; Quadratic Functions and Inequalities; Complex Numbers; Zeros of Polynomial; Functions; Theory of Equations; Miscellaneous Equations; Graphs of Polynomial Functions; Rational Functions and inequalities; Exponential Functions and Their Applications; Logarithmic Functions and Their Applications; Rules of Logarithms; More Equations and Applications; Systems of Linear Equations in Two Variables; Systems of Linear Equations in Three Variables; Nonlinear Systems of Equations; Partial Fractions; Inequalities And Systems of Inequalities in Two Variables; Linear Programming.

GEN 150: Introduction to Science & Technology

Course Description

Science encompasses the systematic study of the structure and behaviour of the physical and natural world through observation and experiment, and technology is the application of scientific knowledge for practical purposes.

Course Objectives

The course aims at demystifying scientific concepts, exposing the latest developments in science and technology, and making the subject more interesting and understanding to students. It should reflect the latest advances in the field while continuing to provide students with a road map to the complex interdisciplinary terrain of science and technology studies. Portray the growth of science and technology and their application in industry and human welfare, with a view to develop scientific attitude and temper and to create, inculcate and sustain a general awareness amongst the people. Encourage science education, communication and technology transfer.

Course Content

It begins by defining science and technology, and their various sub-fields, and covers a relatively new academic field that has at its core the relationship between scientific knowledge, technological systems, and society. Students will be engaged in topics such as environmental concerns, evolution, vaccinations, GMOs, 3-D printing, human genome project, stem cell research, drug development, GPS, robotics, renewable energy, informatics and other advances in science and technology. In addition. Different views of science; in particular the rationalist, empiricist, positivist, Kuhnian and falsificationist views. Instrumentalism and realism is also covered; Basic epistemological limitations such as the problem of observation and of induction in basic science and problems of knowledge about functionality and usefulness in technological research; Models of technology and their dependence on external influences in society; Implications for the question of the rationality of science and technology; their limits and possibilities.

GEN 210: Foundations of Philosophy & Religion

Course Description

The course introduces students to philosophy and religion. In philosophy, students will begin by defining philosophy and understanding its main branches, but focuses mainly on logic, proof and critical thinking. Sacred texts and world philosophies taught by various religious traditions, alongside the writings of some of the greatest world philosophers. Explore fascinating debates concerning human nature, conceptions of the divine, belief and doubt, existence, truth, and to reflect on the ways we think we know what we know.

Course Content

Topics such as the nature of arguments, deduction and induction, syllogistic logic, propositional logic, quantified predicate logic, fallacious reasoning, scientific and critical reasoning will be studied. Ethics, approached from the perspective of moral philosophy and moral theology, will also be studied with a focus on the ethics of duty, idealism, utilitarianism, virtue, relativism, pragmatism, pluralism, critical ethics, ethics of care, and ethics of professionalism. Students will learn the relevance of ethics in addressing current challenges such as terrorism, gender, equality, diversity, cultural recognition, competition, dishonesty, privacy, discrimination, reward and punishment. Finally, the course treats religion, covering such topics as comparative study of major religions, science and religion, liberation theology, religious enculturation, fundamentals of Catholicism, and the Church's Social Teachings.

Course Objective:

Provide multidisciplinary curricula informed by the research and scholarly activities of the teaching staff; Develop your critical understanding of the interaction between philosophy and religions through a range of learning and teaching methods; Equip you with the skills necessary to interpret primary and secondary sources; Provide appropriate language instruction, where feasible; Help students from diverse backgrounds progress through their course by providing effective academic and pastoral support; Equip you for a variety of careers through subject specific knowledge, active engagement in your own learning and the development of analytical and other transferable skills.

GEN 230: Introduction to Computer Information Systems
Course Description
An introductory course designed to teach the basic understanding of computer information systems, survey computer hardware and software, and give the student hands-on experience on common business applications. It introduces students to the basic concepts and developments in information systems. Areas of study include computer technology, information system concepts, information systems development, and the use of technology in organizations.
Course Objectives
Upon satisfactory completion of the course, students will be able to:
Recognize the impact of computers on society; Identify and use common types or input/output devices and discuss new technology devices; Be able to explain the basic functions of the central processing unit; Describe types and functions of operating systems and demonstrate operating system software commands; Be able to explain the use of various computer storage media; Be able to identify and describe activities involved in designing and developing computer programs; Demonstrate knowledge of word processing, spreadsheet and database applications; Explain the procedures for system analysis and the steps involved in system design and Explain how users transmit data over networks.
Course Content
Management System Introduction; Digital Literacy: Introducing a World of Technology; The Internet: Accessing, Searching, Sharing and Communicating; Computers and Mobile Devices: Evaluating the Possibilities; Programs and Apps: Using Software at Work, School, and Home; Digital Safety and Security: Identifying Threats, Issues, and Defenses; Inside Computers and Mobile Devices: Exploring the Components; Input and Output: Examining Popular Devices; Digital Storage: Preserving on Media and in the Cloud; Operating Systems: Managing, Coordinating, and Monitoring Resources; Communications and Networks: Sending and Receiving Digital Content; Information, and Data Management: Organizing, Verifying, Maintaining, and Accessing; Information Systems and Program Development: Designing and Building Solutions.

GEN 240: English Grammar & Composition
Course Description
This course emphasizes the study of grammar and composition.
Course Objectives

Introduce and explore word origins and various parts of speech to prepare students for critical reading and writing. This course also introduces students to practical applications for writing, such as business letters and memos. Provides an analytical overview of grammar, punctuation, and sentence structure to help students improve writing skills, including writing efficiently and effectively. Introduce students to practical applications for writing, such as cover letters and resumes. It guides students through the steps for writing essays, from prewriting to final draft, and discusses various types of essays.

GEN 250: Introduction to Social Sciences
Course Description
This is a foundational course which introduces students to elementary aspects of social science.
Knowledge and understanding of the social sciences place students in position to understand themselves as citizens within an integrated global society.
Course Objectives
The purpose of this course is to provide students with information about the principal social science disciplines and the relationships among them. Prepare the student to engage in rational decision-making as both an individual and as a citizen. Provide both knowledge of the subject area (covering a canon of fundamental theories and topics within the history of social science, as well as raising contemporary questions) and develop essential academic skills, required for effective independent learning.
Course Content
The course is divided into 3 key 'knowledge' sections, with a shorter introductory section. The introductory section examines the history, development, methods and approaches of social sciences in general, developing students' awareness of a 'social perspective' on the world around them. Each subsequent 'main' section focuses on two or three different social science disciplines. The first section is entitled 'Social difference' (on sociology and anthropology), the second 'Social inequality' (on economics and social policy), and the third 'Social security' (on politics, law and sociology). In between tutor-led 'knowledge' based classes there are 'skills' sessions, where the focus is on student participation with exercises involving collaborative working, technical skills (referencing, writing), using ICT systems, or developing essay planning.

GEN 410: Business & Entrepreneurship Project
Course Description
The course equips students to the theory of entrepreneurship and and its practical implementation. It focuses on different stages related to the entrepreneurship process, including business model innovation. Monetization and small business management.
Course Objective
The purpose of this course is to help students to develop the cognitive skills they need to understand the principles and mechanics that regulate everyday business life, to prepare them to deal effectively with the challenges of contemporary life, including issues in the business-society relationship, its history, world events, economic issues, and future expectations. Examine the factors that lead towards entrepreneurial success, and the skills and behaviors necessary to be a successful entrepreneur. The course will cover design, creativity and entrepreneurship, the characteristics of and types of entrepreneurs, pathways to entrepreneurs and requirements for success.

GEN 420: Fundamentals to Research Methods & Statistical Analysis
Course Description
This course is designed to provide foundation knowledge of research methods commonly used.
Course objectives
The course will prepare the student to understand material and issues associated with but not limited to the logic of the scientific method, research designs, as well as the use of statistical packages for descriptive and inferential statistics.
Course Content
This course will cover research processes employing quantitative and qualitative methods. Topics include ethical considerations, observational and survey research techniques, graphing, central

tendency and variability, correlation and linear regression, hypothesis testing etc. Students participate in data collection, data analysis and interpretation by means of the microcomputer Statistical Package for the Social Sciences (SPSS) and in the writing of APA-style research reports.

9.0 Core Courses for BACHELOR OF AGRICULTURE (BSc.Agric)

9.1 Program Structure
To be awarded a Bachelor of Agriculture Degree, a student must complete the prescribe courses and earn at least **220** credits, with at least **180** coming from core/concentration courses. All students in the first two years will undertake all courses in general agriculture and then concentrate in either agronomy, animal science or agricultural economics courses in the last two years of studies depending on the students option.

9.1.1 Core Courses
AGRI 2011 Introduction to Agriculture

AGRI 2111 Mathematics for Agriculture

AGRI 2021 Agricultural Biochemistry

AGRI 2031 Principles of Management

AGEX 2042 Rural Sociology and Institutions

ANSC 2052 Principles of Animal production

AGRO 2062 Principles of Crop production

AGRI 2072 Physics for Agriculture

AGRI 2092 Agricultural Botany

AGEX 2101 Introduction to Agricultural Extension and Rural Development

ANSC 3272 Anatomy, Physiology of Farm Animals

AGRO 2121 Meteorology and Agroclimatology

AGEE 2151 Farm Power and Biofuels

AGRO 2081 Introduction to Soil Science

AGRO 2161 Pedology and Soil Classification

AGRI 2182 Introduction to Agricultural Statistics

Principles of Pest Management

AGRI 3201 Land and Labour Law

AGRO 3221 Principles of Agroforestry

Post Harvest Management

AGRO 2192 Principles of Crop Protection

ANSC Pasture & Range Management

AGEC Introduction to Farm Management

AGEX 2101 Introduction to Agricultural Extension & Rural Development

AGEC 2141 Introduction to Agricultural Economics

AGRO 3262 Crop Anatomy, Physiology & Taxonomy

AGRO 3282 Soil Fertility & Plant Nutrition

ANSC 3302 Animal Nutrition

Practicum Courses

AGRO 3292 Plant & Soil Analysis

AGRO 3211 Farm Surveys, Design and Land Use

AGEE 2172 Farm Mechanization

AGRI 2131 Farm Practice

AGRI 2232 Internships

9.1.2 Course Breakdown

		1st Year						
		First Semester						
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	GEN 1011	Use of English 1	3	C	30	0	0	30
2	GEN 1031	Sports & Physical Education	3	C	10	0	20	30
3	GEN 1301	Civics and Ethics	3	C	30	0	0	30
4	GEN 2501	Introduction to Psychology and Social Sciences	3	C	20	0	10	30
5	GEN 1401	College Algebra	3	C	30	0	0	30
6	AGRI 2011	Introduction to Agriculture	6	C	40	20	0	60
7	AGRI 2021	Biotechnology & Biochemistry for Agriculture	6	C	20	20	20	60
8	AGRI 2031	Principles of Management	6	C	40	0	20	60
		Semester Total	33		220	40	70	330
		Second Semester						
9	AGEX 2042	Rural Sociology & Institutions	3	C	20	10	0	30
10	ANS 2052	Principles of Animal Production	6	C	30	20	10	60
11	GEN 2302	Computer Information System	3	E	20	0	10	30
12	AGRO 2062	Principles of Crop Production	6	C	30	20	10	60
13	AGRI 2072	Physics for Agriculture	6	C	40	20	0	60
14	GEN 1202	Functional French 1	3	C	20	10	0	30
15	AGRI 2092	Agricultural Botany	6	C	40	20	0	60
16	AGRI 2132	Farm Practice 1	3	C	0	0	30	40
		Semester Total	36		190	90	60	370
		YEAR TOTAL	690		410	150	130	690
		2nd Year						
		First Semester						
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	AGEX 2101	Introduction to Agricultural Extension and Rural Development	6	C	40	20	0	60
2	AGRI 2111	Mathematics for Agriculture	6	C	40	20	0	60

3	AGRO 2121	Meteorology & Agroclimatology	3	C	20	10	0	30
4	GEN 1031	Use of English 11	3	C	20	10	0	30
5	AGEC 2141	Introduction to Agricultural Economics	6	C	50	10	0	60
6	AGEE 2151	Farm Power & Bio fuels	6	E	40	20	0	60
7	AGRO 2081	Introduction to Soil Science	6	C	40	20	0	60
		Semester Total	36		250	110	0	360
		Second Semester						
8	AGRO 2162	Pedology and Soil Classification	6	C	40	20	0	60
9	AGEE 2172	Farm Mechanization	3	C	20	10	10	40
10	AGRI 2132	Introduction to Food Science & Technology	3	C	0	10	30	40
11	AGRI 2182	Introduction to Agricultural Statistics	6	C	40	20	0	60
12	AGRI 2232	Internship	3	C	0	10	50	60
13	GEN 1202	Functional French 11	3	C	30	0	0	30
14	AGRO 2192	Principles of Crop Protection	6	C	40	20	0	60
15	AGRO 2202	Introduction to Soil Sciences	6	C	20	10	0	30
		Semester Total	36		190	100	90	380
		YEAR TOTAL	72		440	210	90	720

3rd Year (Agronomy Option)

First Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	AGRO 3201	Principles of Organic Farming	6	C	40	20	0	60
2	AGRO 3211	Farm Surveys, Design and Land Use	3	C	20	10	0	30
3	AGRO 3221	Principles of Agroforestry	6	C	40	20	0	60
4	AGRO 3451	Principles & Methods of Soil & Water Conservation	6	C	40	20	0	60
5	AGRO 3241	Irrigation & Water Management	6	C	40	20	0	60
6	AGRI 3131	Farm Practice	3	E	20	10	0	30
7	AGEC 3251	Farm Management & Production Economics	6	C	40	20	0	60
		Semester Total	36		240	120	0	360
		Second Semester						
8	AGRO 3262	Crop Anatomy, Physiology & Taxonomy	6	C	40	20	0	60
9	AGRO 3462	Vegetable Crop Production	6	C	40	20	0	60
10	AGRO 3282	Soil Fertility & Plant Nutrition	6	C	40	20	0	60
11	AGRO 3292	Pant & Soil Analysis	6	C	40	20	0	60
12	AGRO 3472	Introduction to Plant Pathology	6	C	0	0	60	60
	AGRO 3482	Fundamentals to Horticulture	6	C	40	20	0	60
		Semester Total	36		140	70	60	360
		YEAR TOTAL	72		360	180	90	720

3rd Year (Animal Science Option)

First Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	ANSC	Non Ruminant Animal Production	6	C	40	20	0	60

S/N	Course Code	Course Title	CV	S	L	T	P	Total
	3491							
2	ANSC 3591	Farming Systems & Sustainable Development	3	C	20	10	0	30
3	ANSC 3511	Livestock Animal Production & Management	6	C	40	20	0	60
4	ANSC 3231	Pasture and Range Management	6	C	40	20	0	60
5	AGRI 3521	Entrepreneurship Development	6	C	40	20	0	60
6	ANSC 3531	Animal Health & Disease Management	3	E	20	10	0	30
7	AGEC 3251	Farm Management & Production Economics	6	C	40	20	0	60
		Semester Total	36		240	120	0	360
		Second Semester						
8	ANSC 3541	Equine Management	6	C	40	20	0	60
9	ANSC 3272	Anatomy & Physiology of Farm Animals	6	C	40	20	0	60
10	ANSC 3552	Livestock & Companion Animal Behaviour	6	C	40	20	0	60
11	ANSC 3562	Dairy Cattle Technology	6	C	40	20	0	60
12	AGRI 3132	Farm Practice	6	C	0	0	60	60
	ANSC 3302	Animal Nutrition	6	C	40	20	0	60
		Semester Total	36		140	70	60	360
		YEAR TOTAL	72		360	180	90	720

3rd Year (Agricultural Economics/Agribusiness Option)

S/N	Course Code	Course Title	CV	S	L	T	P	Total
		First Semester						
1	AGRI 3201	Land & Labour Law	6	C	40	20	0	60
2	AGEC 3352	Introduction to Microeconomic Theory	3	C	20	10	0	30
3	AGEC 3411	Structure of Cameroon Economy	6	C	40	20	0	60
4	AGEC 3411	Agricultural Finance Management	6	C	40	20	0	60
5	AGEC 3511	Introduction to Natural Resource Economics	6	C	40	20	0	60
6	AGEC 3611	Basic Econometrics	3	E	20	10	0	30
7	ANSC 3501	Farming Systems and Sustainable Development	6	C	40	20	0	60
		Semester Total	36		240	120	0	360
		Second Semester						
8	AGEC 3812	Agribusiness Management	6	C	40	20	0	60
9	AGEX 3412	Communication & Extension Teaching Methods	6	C	40	20	0	60
10	AGEC 3352	Economics of Agro-based Industries	6	C	40	20	0	60
11	AGEC3362	Principles of Development Economics	6	C	40	20	0	60
12	AGRI 3132	Farm Practice	6	C	0	0	60	60
			6	C	40	20	0	60
		Semester Total	36		140	70	60	360

	YEAR TOTAL		72		360	180	90	720

9.2 Concentration Courses

4th Year								
Option - Agricultural Economics & Agribusiness								
First Semester								
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	AGEC 4361	Agricultural Production Economics	6	C	40	20	0	60
2	AGEC 4391	Cooperative Management and Associations	6	C	40	20	0	60
3	AGEC 4311	Research Project 1 (Seminar)	6	C	40	20	0	60
4	AGEC 4381	Agricultural and Food Marketing	6	C	40	20	0	60
6	AGEC 4341	Operations Research	6	C	40	20	0	60
		Semester Total	36	… ….....	240	120	00	360
		Second Semester						
6	AGEC 4312	Research Project 2 (Long Essay)	6	C	0	0	60	60
7		Agricultural Policy	6	C	40	20	0	60
8	AGEC 4372	Introduction to Macroeconomic	6	C	40	20	0	60
9	AGEC 4472	Intermediate Farm Management	6	C	0	0	60	60
		Agro-industrial Project Analysis	6					
		Semester Total	30		80	40	120	240
		Year Total	60		320	160	120	600

S/N	Course Code	Course Title	CV	S	L	T	P	Total
		4th YEAR **Option – Agronomy**						
		First Semester						
	AGRO 4371	Forage Crops	6	C	40	20	0	60
	AGRO 4381	Genetics and Plant Breeding	6	C	40	20	0	60
	AGRO 4391	Introduction to Diagnostic Techniques	6	C	40	20	0	60
	AGRO 4401	Soil & Plant Nutrition	6	C	40	20	0	60
	AGRO 4411	Post Harvest Physiology & Technology	6	C	40	20	0	60
		Total Semester	30		200	100		300
		Second Semester						
	AGRO 4422	Introduction to Insect Classification and Ecology	6	C	40	20	0	60
	AGRO 4432	Bioecology of Plant Pathogens	6	E	40	20	0	60
	AGRO 4442	Pesticides and Toxicology	6	C	40	20	0	60
	AGRO 4452	Integrated Pest Management	6	C	40	20	0	60
	AGRO 4462	Weeds & Weed Management	6	C	40	20	0	60
	AGRO 4312	Research Project (Long Essay)	6	C	40	20	0	60
		Total Semester	36		260	100	0	360

S/N	Course Code	Course Title	CV	S	L	T	P	Total
		4th YEAR Option - Animal Sciences						
		First Semester						
	AGR 4691	Integrated Livestock Farming Systems	6	C	40	20	0	60
	AGR 4601	Genetics and Animal Breeding	6	C	40	20	0	60
	AGR 4621	Ruminant and Diary Animal Production	6	C	40	20	0	60
	AGR 4661	Livestock Business Management	6	C	40	20	0	60
	AGR 4311	Research Project	6	C	40	20	0	60
		Total Semester	30		200	100		300
		Second Semester						
	AGR 4312	Research Project (Long Essay)	6	C	40	20	0	60
	AGR 4632	Analytical Methods in Animal Nutrition	6	E	40	20	0	60
	AGR 4652	Ethology	6	C	40	20	0	60
	AGR 4602	Ruminant Animal Production	6	C	40	20	0	60
	AGR 4642	Biochemistry of Animal Nutrition	6	C	40	20	0	60
	AGR 4312	Research Project (Long Essay)	6	C	40	20	0	60
		Total Semester	36		260	100	0	360

9.2.1 Core Courses Synopsis

AGR 2011: Introduction to Agriculture
Course Descriptions
This course provides an orientation to agricultural careers and the agriculture major by laying down the basic principles of crop, animal, soil science, forestry, resource conservation, pest management, aquaculture, food science and nutrition, marketing and extension etc.
Course Objectives
Develop an awareness of the careers in the fields of agriculture. Expand and understanding of the basic principles of vegetable gardening, animal husbandry, forestry, soil and water conservation, pest management, plant and animal nutrition, farm management, and agriculture extension. Explain how agriculture helped develop civilization. Analyze the career opportunities in agriculture. Discuss the education needed for different jobs in agriculture. Explain why agriculture and all of life depends on the soil.

Course Content

Introduction to the Science of Agriculture. The importance of soil. The process of plant reproduction. Trees in the ecosystem. Understanding the major animal systems. The growth process of animals. Disease factors in plants and animals. Weeds. Insects. Crop budget. Careers and opportunities in agriculture.

AGR 2021: Biochemistry for Agriculture
Course Description

The course provides fundamental biochemistry knowledge for students offering agriculture. It will entail the study of both chemistry and biochemistry which are important in agricultural production.

Course Objectives

Drawing the techniques of analytical. Organic and physical chemistry, as well as those of physiologists concerned with molecular basis of vital processes.

Course Content

The major bio-chemical compounds – water, carbohydrates, lipids, proteins and nucleic acids. Biochemical organization of the cell. Ions in biochemical systems pH, buffers. Intermediary metabolism – glycolysis, TCA cycle, PPP lipid oxidation, protein catabolism. Electron transport system, photosynthesis, vitamins, minerals, coenzymes, etc. In addition, inorganic chemistry will be part of the course. Inorganic Chemistry : Atoms : Sub-atomic particles, isotopes, Avocado's number ; the mole concept ; chemical formulae ; the laws of chemical combinations ; equations and calculations ; state of matter ; gases ; liquids and solids ; chemical thermodynamics synergetic and thermo chemistry; buffers; chemical equilibrium and equilibrium constants; solubility products; chemical kinetics; electrochemistry; Nuclear binding energy, fission and fusion. Organic Chemistry: Nomenclature and classes of organic compounds; Homologues series Alkanes and cycloalkanes, alkenes, alkynes, Functional groups; Benzene and aromaticity; Isolation, purification and identification of organic compounds; the chemistry of alcohols, phenols, aldehydes, ketones, carboxylic acids and amines.

AGR 2072 Physics for Agriculture

Course Description

It gives students a good foundation in physics with related earth science phenomena and agricultural applications. It is intended to explore the relevance of physics in agriculture.

Course Content

Selected topics would include: mechanics, heat, optics, light, thermal physics, atomic and nuclear physics, thermodynamics and radiation and their application to agriculture. Emphasis will also be on the Use of measuring instruments. Surface tension, inertia, viscosity, refractive index, optical instruments, tension, energy, heat capacity, temperature, heat and work, Obscure expansions, latent heat waves, current flow, forces, laws of motion as they relate to agriculture will also be explored.

AGR 2111 Mathematics for Agriculture

Course Description

In Mathematical Applications in Agriculture, Food, and Natural Resources, will entail application of knowledge and skills related to mathematics, including algebra, geometry, and data analysis in the context of agriculture, food, and natural resources.

Course Objectives

At the end of the course students should be able to - Develops the ability to utilize skills and technology to solve problems at a level found in non-mathematics-intensive programs.

Course Content

Topics include applications to percent, ratio and proportions, formulas, algebra and solutions to linear equations and the elements of plane geometry. Applications include, but are not limited to, business, finance and agriculture. Topics in Contemporary Math also part of the course.

AGR 2092 Agricultural Botany

Course Description
This course surveys the biology of the plant kingdom.
Course Objective

The objective of this course is to provide an understanding and appreciation of varieties of plant in the context of agricultural production as an important factor of technological progress in agriculture. This is also geared toward the development and improvement of method of agricultural production

Course Content

Topics include the evolution of the major groups and a comparative analysis of the form (anatomy), function (physiology), and life history of plants. Heterotrophic bacteria and fungi in the context of plant pathology, emphasis on the importance of plant symbiotic associations with fungi (mycorrhizae) and the Rhizobium-legume symbiosis will also be part of this course. Mechanisms of evaluation, reproduction, and gas exchanged circulation and transport, nutrient acquisition, population genetics in plants, animal and micro – organisms.

AGR 2042 Introduction to Agricultural Extension and Rural Institutions

Course Description

The course is designed to stimulate the students' interest in agricultural extension and rural development, the meaning, Historical background to extension from the beginning. Rural Sociology will be introductory intended to expose the students to rural life studies. As agricultural extension trainees, the students need to be intimated and well informed about social life in the rural society in terms of culture, values, norms, beliefs and economic livelihoods.

Course Objective

Therefore, the course is planned to arm the students on how to be effective and proficient in the art of working with the farmers, having understood how the rural dwellers interact sand interrelate on the premises of the values they hold on to.

Course Content

Topic to be covered include; Meaning and Scope of Rural sociology, Basic Sociological Concepts, Major Social Institutions, social Groups and Social Processes. Other topics also include: Social Stratification and social Mobility, Diffusion Process in Agricultural Innovation and Challenges of Rural Development in Cameroon

AGR 2031 Principles of Management

Course Description

This is the introductory course in management. The course is designed to provide students with an overview of the management functions and its role in organizations and society. It presents the principles, techniques, and concepts needed for managerial analysis and decision-making. It highlights the effective management of planning, organizing, influencing, and controlling related to the internal and external environment and issues of ethics and social responsibility.

Course Objective

The course aims to provide students with the basic managerial knowledge necessary for
Business students. The course focuses on providing students with analytical,
developmental, managerial and technical skills that relate to managerial positions in
organizations.

Course Content

Topics include planning, organizing, staffing, leading and controlling, as well as decision-making and managing change. The course should develop a "systems" view of organizations that examine organizations as part of a context, including but not limited to environment, strategy, structure, tasks, people and output

AGR 2062 Principles of Crop Production

Course Description

This course describes the fundamental and principles of field crop production systems, including cultural practices, harvesting, environmental impacts and cost analysis. Crop production and its development. The principles, problems and prospects of crop production. Importance of crop rotation, cultural practices and soil conservation, irrigation and drainage. Principles of crop production, harvesting, processing and storage.

Course Content

The course will also include discussions on basic knowledge about protection of plants from pest infestation and disease infection: importance, biomorphology, and ecology of plant pests; importance and concept of plant disease; classification of plant disease; symptom and the damage caused by plant pathogens; parasitism and disease development; the causal agents of plants disease; plant defense against infection plant disease; plant disease epidemy and the factors involved; principles of plant and disease management; and integrated pest management concept. It will also be based on the curriculum of Pest Management in Arable and Horticultural Crops. Thematics: taxonomy, morphology, geographical distribution, economic importance, life cycle and natural enemies of pest insects, mites, nematodes and vertebrates; biological, cultural, physical, chemical, bio-rational and biotechnological protection against pests.

AGR 2081 Principles of Soil Sciences

Course Description
Fundamental principles of soil sciences, a comprehensive study of the chemical, physical, and biological properties/ components of soils, their applications to crop production and other land uses; the origin, classification, and distribution of soils and their influence on people and food production; the management and conservation of soils; and the environmental impact of soil use.
Course Objective
Conduct a complete soil profile description using professional terminology. Demonstrate basic understanding of USDA NRCS soil orders. Learn where to find and how to apply existing soil science data resources & research to real world scientific challenges or land management issues
Course Content
Special attention will be given to the influence of climate change on soil functions. Classification and geographical distribution will be also discussed. The topics of soil degradation problems and processes and soil monitoring will end the course. A study of the relationship of soil chemistry, forms of nutrients in soils, and role of plant nutrients in crop production, as well as other factors associated with soil productivity; and basic concepts of fertilizer application and manufacturing. Chemical and mineralogical composition of soil; fundamental chemical properties of soils; nature and properties of soil colloids; cation exchange phenomena in soils; soil reaction, and soil acidity are addressed in this course.

AGR 2052 Principles of Animal Production
Course Description
An overview of principles of Animal Science and the interrelationships of domestic animals and mankind. The course introduces some basic biology of animals including cell function, genetics, anatomy and physiology, reproduction, nutrition, animal health and disease, animal products, and animal behavior.
Course Objective
Animal science—the study of the biological function of domestic and captive animals and their utilization by people—focuses on modern, efficient and humane ways to care for and make the best use of the animals who share our lives.
Course Content
Emphasis will be on of cattle, sheep, goats and Introduction to farm animals/ livestock sector in Cameroon, breeds poultry, products of farm animals (meat, milk , eggs, wool), basic concepts in genetic improvement, reproductive and digestive systems, nutrients and their functions, husbandry of farm animals.

AGR 3251 Basic Farm Management and Production Economics
Course Description
The course is intended to shed light on the meaning, scope and objectives of agricultural management.

Course Objectives

To know the way forward for an efficient production; determine the combinations of most profitable amount of inputs; and estimate how the production will respond to a change in the price of output

Course Content

Functions and tools of farm management. Effects of socio- economic environment on farm management functions. Steps in farm management decisions. Farm records and accounting. Farm budgeting, including complete, partial and breakeven budgeting. Linear programming as a tool for farm enterprise planning. The nature of agricultural production problems, goals and objectives of agricultural production, principles of resources use with particular reference to the optimum level of resources use. Principles of optimum product combination. Empirical production functions. Supply and cost elasticity. Production and production planning in agriculture using the methods of linear programming and simulation; production decision making under risk and uncertainty; types of production risks and uncertainties in agriculture. Production diversification and risk minimization. Uncertainty management with the use of subjective probability and the game against – nature approaches.

AGR 3241 Introduction Food Science and Technology

Course Description
This course is designed to review the global food situation with emphasis on Cameroon. Students will be introduced to foods of plant and animal origin and their micro flora.
Course Objectives
This course is designed to provide a general overview of food science and technology and to discuss the future role of food technologist, developments and innovations in food science and technology
Course Content
The proximate composition and some natural chemical constituents of foods, the nutritional status of different foods, basic physical, chemical and biological principles of food processing and preservation will be looked into. They will also be taught engineering units and dimensions applicable to the food industry and the use of flow charts, equations and stoichiometry.

AGR 2162 Pedology and Soil Classification

Course Description

It presents an understanding of soil properties and processes which is therefore critical to the evaluation of the criteria to be adopted for the soil management. Detailed pedological knowledge is useful for land evaluation purposes, i.e. the classification in fertile productive soils and less valuable soils. Soils are an integral part of landscapes and the knowledge of the distribution of different soils helps to preserve a high standard in environmental quality.

Course Objectives

The aim of the course is not complex. The course aims to provide students with an understanding of soil pedology and classification; it also aims to provide students with solutions to problems with soil classification in the field.
Course Content
Soils as dynamic natural three dimensional system developments, formation and classification. Study of the comprehensive systems and scheme of classification. Study of soil and water conservation principles as related to wind and water erosion control, water utilization and runoff control, irrigation and drainage principles relating to crop production

AGR 2151 Farm Power and Biofuels

Course Description

This course is a course meant to introduce students in Agricultural & Environmental Engineering to farm power and machinery.

Course Objective
course "focuses on combustion fuels made from nonpetroleum sources and introduces the sources, processing, and social impacts of biofuel utilization. At the end of the course, "students will be able to describe: how petroleum and bio-based fuels affect machines, the global carbon cycle, the attributes of biofuels that make them suitable as a fuel for a specific application, limitations of biofuels, global impacts of biofuels on food and energy supplies, and technological advances and challenges to be overcome for a wide-scale biofuel adoption.

Course Content
Farm power sources; selection and management of farm tractors and implement. Development of tractors, Tractor force analysis, fuels and fuel combustion. Constructional features and operation of tractor engines; spark ignition systems, compression ignition systems, lubrication and lubricating systems, engine cooling and cooling systems. Design of spark ignition and compression ignition engines. Types of farm machinery. Principles of construction, operation and adjustment of farm implements for: primary tillage, secondary tillage, planting, fertilizer application, weed control (cultivation), spraying, harvesting and on-the-farm processing. Farm power in Cameroon: sources, I.C engines, working principles, two stroke and four stroke engines, I.C. engine terminology, different systems of I.C. engine. Tillage implements: Implements for intercultural operations, seed drills, paddy transplanters, plant protection equipment and harvesting equipment; Equipment for land development and soil conservation. Animal traction.

AGR 3262 Crop Anatomy, Physiology and Taxonomy
Course Description
Plant Taxonomy - A systematic overview of the plant kingdom focusing on classification and identification of unknown specimens.

Course Objectives
Students will be able to:
Understand plant morphological terminology and use it accurately in the description and identification of plant species. Identify and provide family characteristics of at least 25 flowering and non-flowering plant families.
The principal aim is to introduce the students to classical and modern concepts in green plants. Emphasis on the importance of photosynthesis, gas exchange, water, and environment responses. Understanding of plant cell structure and function

Course Content
Classification of Agricultural plants: Division, Phyla, Class, Order, Family, Genus, Species. Microscope and its use; plant cell structures and organelles Development of cells and tissues; comparative anatomy of major plant organs Enzymes Seed germination and dormancy Respiration and energy balance of crops Photosynthesis, translocation and assimilate distribution in relation to yield determination Water relations Plant growth substances and their role in crop production

AGR 2121 Agroclimatology and Meteorology
Course Description
It entails studying of the atmosphere and motions within the atmosphere on short-time scales and of climates or long-term mean atmospheric conditions over a particular place as well as the extremes

Course Objective
The course aims to provide a good understanding of the climatic systems for a better management of agriculture. Students are able to make Strategic decisions in long-range planning and Tactical decisions in short-term planning

Course Content
Expressly state the relationship between climate and agriculture. Its importance and practical applications of the following subjects: climatological parameters, Scope and nature of climatology, elements and factors of weather and climate, energy and water balances of surfaces, microclimates, interaction with plant covers (incl. forest), topoclimatology, influence of extreme meteorological events in connection with temperature, quantity of precipitation, types of precipitation, wind; agroclimatological information and their dissemination, influence of climate change on agroclimatology. Composition and structure, solar radiation, Nature, properties, depletion, solar

constant and energy balance, Formation and classification of clouds, Introduction to monsoon, Basics of weather forecasting, the dynamics of the atmosphere, seasonal variations in the different factors of the climate. State the relationship between climate and agriculture.

AGR 3282 Soil Fertility and Plant Nutrition

Course Description

This course will entail a study of the relationship of soil chemistry, forms of nutrients in soils, and role of plant nutrients in crop production, as well as other factors associated with soil productivity; and basic concepts of fertilizer application and manufacturing.

Course Objectives

This course is intended to bridge theoretical aspects of plant mineral nutrition and practical applicability of basic principles of fertilization.

Course Content

Soil conditions affecting availability of plant nutrients; function and movement of nutrients in plants; methods of determining nutrient levels in plants, soils, and other growing media. Environmentally sound crop nutrient management strategies. Effects of environmental conditions and nutrient management on crop production, environmental quality will be outlined. Also, the course will cover Essential nutrients required for plant growth, Exclusive requirements of higher plants; criteria for an element to be essential to plants. Macro and Micro nutrients; classification of nutrients; Biochemistry functions. General function of elements. Factors affecting mineral content of plants material, nutrient uptake and assimilation, Micro-nutrients physiology etc. Nutrient deficiency symptoms, Nutrient recycling and Plant adaptations to nutrients.

AGR 3302 Principles of Animal Nutrition

Course Description

A comprehensive review of the chemistry and functions of carbohydrates, proteins, lipids, vitamins, minerals, and water; and the physiology of digestion of these nutrients in animals. It gives basic information about the feeds and feeding of farm animals and the scientific basis of nutrition.

Course Objective

The goal is for the student to develop a comprehensive knowledge of basic nutrition. The student will become familiar with nutrient classification, function, analysis, signs of deficiency and signs of toxicity.

Course Content

Topics to be covered include review of the digestive tracts and digestion process in ruminants and non-ruminants, bioenergetics, water in relation to nutrition, basic nutritional and metabolic processes of carbohydrates, fats and proteins. Others include elements of human nutrition, food survey and food balance sheet. Nutrients of feeding stuffs (water, dry matter, crude protein, crude fat, crude fibre, other carbohydrates, inorganic materials, other biologically active materials). Digestibility properties of some farm animals. Ruminants and complete feed composition (non-ruminants). Energy sources; Feeds and feed stuffs that provide certain nutrients -Minerals. Feedstuffs/Nutrition -Different types - Quality of feedstuffs and nutrition supplements; Processing of feedstuffs and feed -Storage and feeding practices; Common feeding systems and practices. Factors affecting digestion and absorption. Nutrient metabolism – carbohydrates, fats, nitrogenous fractions of feeds, minerals, vitamins and water. Nutritional diseases. Non-nutritional problems. Poisonous plants. Types and roles of feedstuffs

AGR 3131 Internship

Course Description

Students are expected to go out to the field in agricultural Companies and gain first hand information and practical skills in any of the fields of Agriculture.

Course Objectives

AGR 322 Principles of Agroforestry

Course Description

This course is designed for students in forestry and allied disciplines. It considers topics such as agroforestry components and interactions. Review of some modern agroforestry systems such as tuangya, alley cropping improved fallow etc. design and evaluation of agroforestry systems

Course Objectives

The course aims at creating an understanding of agroforestry as an integral part of land use systems. It will examine past agroforestry practices, experiences and knowledge as well as the recent developments and research findings in agroforestry.

Course Content

AGR 3231 Pasture and Range Management

Course Description

This subject focuses on the management and utilization of pastures across a range of ecosystems. The various components will be identified, described, analyzed and integrated to develop an annual supply of forage. The suitability and utilization of pastures will be matched to animal needs, nutrition and health. Grazing management systems and fodder conservation will be investigated and assessed for livestock and pasture systems. A series of activities will be designed to develop the ability to apply a range of skills in a practical situation

Course Objective

There are objectives to be achieved in each module of the course on completion of this course. Students should be able to : Explain the importance of pasture in animal nutrition; Explain the meaning of common terms used in pasture production and range management; Enumerate the nutritional value and characteristic of pasture forage ; Explain the importance of forages and roughages in crops animal feeds; Explain importance of legumes and shrubs in animal feed; Highlight nutritional quality of legumes; Mention examples of some legumes; Importance of and production of silage.

Course Content

Commonly used Terminologies in pasture and range management; Adaptation of forage plants; Plant introduction ; Pasture establishment; Maintenance and pasture utilization; Forage yield determination; Forage conservation; Pasture nutritive value

AGR 3272 Anatomy and Physiology of Farm Animals

Course Description

This course is designed to introduce basic concepts of functional anatomy, physiology, housing etc of farm animals, laboratory animals and poultry, with emphasis on digestive and reproductive tracts.

Course Content

Physiological basis for growth and development, lactation and milk letdown, egg production, water balance, nervous and hormonal systems, temperature regulation in farm animals. In addition to sheep, goat, pigs and poultry with their maximum requirements of efficient production under different field and environmental conditions.

AGR 3201 Land and Labour Law

Course description

This course seeks to examine principles of law under the land code, laws related to land use, for example, the law on land development, the law on land reforms for agriculture. It will also build on the introductory courses in labour and personal employment law

Course Objective

The major objectives of this course, as designed, are to enable students: mention all the relevant enactments and legislations in relation to labour and land law in Cameroon; describe a valid contract of employment devoid of any impediments and evil; explain who an employee is by the nature of their employment; distinguish the differences in the various terms in an employment contract etc

AGR 3261: Farm Practice

General and individual farm plots (Crop/Agro forestry/Horticulture) on the Teaching and Research farm under the supervision of Farm Officers and the course Lecturer. The focus is on entrepreneurial skills development in crop agriculture, agro forestry, and horticultural production.

AGR 3312 Research Methods and Experimental Designs
Course Description
This course content focuses on two major topical areas: first is Research Methods and second Experimental design with a focus on agricultural research experimentation involving single treatment (experimental) factors.
Course Objective
Course Content
The Research Methods block covers designing research studies, research types along with their similarities and differences (experimental vs. quasi-experimental vs. non-experimental or observational studies), research validity and protecting research from threats to both internal and external validity. The second block covers specific experimental designs frequently used in agricultural research. The designs covered all involve a single treatment or experimental factor (One-Way designs). The Analysis of Variance is introduced along with post hoc analysis featuring a variety of methods for simple one-way designs. The various experimental designs studied are a simple one-way design, for both fixed and random factors, for blocked designs (involving blocking on specimens, as well as blocking on a potential nuisance factor). Other "blocked" designs, to include Latin Squares are briefly covered. Nonparametric procedures for all data types are covered for independent- and dependent-groups designs as well. Statistical procedures are also presented for the assessment of the nature and strength of relationships (correlation and or association) between two variables.

AGR 2182 Statistics for Agriculture
Course Description
It entails the Principles and estimation techniques used in the analysis of agricultural data including measures of central tendency and dispersion, probability, sampling, hypothesis testing, analysis of variance, correlation coefficient, and regression
Course Objectives
Upon satisfactory completion of the course the students will be able to: Compute measures of central tendency and dispersion, and use them to analyze datasets; Summarize datasets using measures of central tendency and dispersion, diagrams and box plots; Compute linear relationships among variables and use them for prediction; Measure the correlation between two agricultural variables and explain the difference between correlation and causation; Explain how linear regression is used to make predictions and Determine null and alternative hypotheses, explain Type I and Type II errors, and state conclusions to hypothesis tests for population mean with known or unknown population standard deviation and for a population proportion
Course Content
Definition and diagrammatic representation of descriptive data, frequency distribution, frequency polygon, histogram, scatter diagram, measures of location and dispersion for grouped and ungrouped data, permutations and combinations; theory of probability; binomial theorem and distribution. Collection, tabulation and representation of agricultural data; correlation, simple analysis of variance and linear regression.

AGR 4132 Internship 2
Same as for internship I

AGR 4232 Project/ Thesis

Each student will conduct a supervised research project topic in any of the areas of specialization in agriculture using an entrepreneurial approach in resolving problems.

AGR 3292 Plant and Soil Analysis

Course Description

Sample, prepare, and analyze soil and plant samples. Interpret chemical results for environmental quality and soil fertility management. Understand soil chemical processes of each plant nutrient. Choose analytical methods and maintain laboratory quality control.

Course Objectives

Soil is analysed to determine its ability to supply the necessary plant nutrients to the crop concerned. Soil analyses are related to potential nutrient uptake, supplementation of plant nutrients through fertilisation and the target yield.

Course Content

Collection and preparation of soil and plant samples. The principles of soil testing. Dissolution for total elemental analysis. Testing for available nutrients in the soil. Testing for pH and lime requirement. Interpretation of analytical results. Principles and practice in plant analysis. Sampling and analyzing tissue samples. Plant analysis as aid in fertilizing crops. Operation and management of a soil testing and plant analysis laboratory.

AGR 2172 Introduction to Farm Mechanization
Course Description:
Introduction to Agricultural Mechanization. An introduction to agricultural power and machinery (engines, power transmission including hydraulics, tillage machinery, calibrations, and harvesting equipment), agricultural electrification and applications (circuits, motors, controls, and materials handling and processing), agricultural structures (plans, loads, construction materials and layout and design), and soil and water conservation (surveying, mapping, drainage and conservation structures).
Course Objectives:
To provide an introduction to: Agricultural Power and Machinery, Agricultural Electrification and Application, Agricultural Structures, Soil and Water Conservation and Conservation Structures, Metal Fabrication; To develop skills using: Surveying Equipment, Hand and power tools, Measuring devices, tools, and diagnostic equipment, Electrical wiring and Emerging Technologies; To develop abilities in mathematical applications (solving technical problems in a logical and legible manner); provide opportunities for career exploration in agricultural mechanization; develop a vocabulary of agricultural mechanization principles and applications and develop and practice safe work skills.
Course Content
Agricultural Power and Machinery (Engines, Power Transmission, Tillage Machinery, Calibrations E. Harvesting Equipment) II. Agricultural Electrification and Application (Circuits, Motors, Controls, Material Handling and Processing); III. Agricultural Structures (Plans, Loads, Construction Materials, Layout and Design and Metal Working); IV. Soil and Water Conservation(Surveying, Mapping, Conservation Structures and Drainage).

AGR 2192 Principles of Crop Protection
Course Description/Content
This course discusses basic knowledge about protection of plants from pest infestation and disease
infection: importance, biomorphology, and ecology of plant pests; importance and concept of plant
disease; classification of plant disease; symptom and the damage caused by plant pathogens;
parasitism and disease development; the causal agents of plants disease; plant defense against
infection plant disease; plant disease epidemy and the factors involved; principles of plant and disease
management; and integrated pest management concept.
Practicum: Observation of general insect morphological characteristics; insect metamorphosis; insect
mouthparts; symptom of damage by insect pests; observation of important orders and families of
insects, mites, slugs, and snails, and rodents; insect collection; observation of disease symptom and
plant damage as well as causal organism of plant disease.
Course Objective
After completing the course, the students will be able to identify pest and disease problems and
develop their management on the field.

AGR 3211 Farm Designs, Survey and Land Use
Course Description
This practical guide is designed for students of agriculture who are in 300 level and need to
know about land survey and farmstead planning. As student of agriculture, land plays an important
role in agriculture as there can be no agricultural production without the use of the land.
Course Objectives
By going through this practical students will have a hand-on some of the equipment used and know
the concept of what land survey and farmstead planning is all about. Students will learn about the
tools equipment use and learn about some of the procedures employ.

9.3 Synopsis of Concentration Courses

9.3.1 Third/Fourth Year (Agricultural Economics)

AEE 4391 Agricultural Cooperatives and Association
Course Description
Basic principles of cooperatives include types of organizations, legal aspects, governance,
membership relations, debt and equity financing, organizational and inter cooperative problems and
distribution of earnings.

Course Objectives
Course Learning Outcomes: By the end of the course, students will be able to do the following:
Understand the role and characteristics of cooperation, collective action, and cooperatives;
Exhibit knowledge of the cooperative model as it exists locally, nationally, and internationally;
Compare and contrast the cooperative model with other types of business entities; and Apply
understanding of cooperative finance and governance to the management of cooperatives

Course Content
Meaning and History of Agricultural Cooperatives, Principles of Agricultural Cooperatives, Types of
Cooperatives, Organization and Management of Cooperatives in Agricultural Development in
Cameroon; women in Agricultural Cooperatives. Basic principles of cooperatives include types of
organizations, legal aspects, governance, membership relations, debt and equity financing,
organizational and inter cooperative problems and distribution of earnings.

AGR 4381 Agricultural and Food Marketing
Course Description
It emphasizes both individual and collaborative learning through the use of individual and
group work, and seeks to stimulate each student's understanding of the entire marketing system for
agricultural and food products from household consumption back to production and agricultural

inputs.
Course Objectives
By the end of the course, as a student, you will be able to:
Describe in detail the Cameroon. agricultural and food marketing system—its participants, characteristics, functions, interdependencies, and major marketing trends; Explain in detail the interactions of various components of agricultural and food marketing systems, how these systems are structured, forms of coordination within systems, and how the performance of a given system and its components can be evaluated; and State the practical application of class material and economic theory, be able to analyze and assess issues and current events unfolding in actual agricultural and food markets.
Course Content
Key elements in the definition of marketing. The nature of agricultural products and effect on marketing. Nature and scope of agricultural marketing, nature of agricultural products and production, and their effects on marketing. Marketing functions, costs and margin. Marketing channels for major Cameroonian agricultural products. Nature of competition in agricultural marketing. Marketing efficiency. Agricultural product prices. Agricultural price policy for development. Storage practices and problems. Transportation of products and associated problems. Investigation of market integration in selected commodity markets. Problems of agricultural marketing in Cameroon and the role of government in agricultural marketing pattern of distribution of agricultural products in Cameroon. Agricultural price analysis. Demand for agricultural products in Cameroon and its effect on farm income. Meaning and scope of Cooperative and agribusiness. Evolution and economic importance of Cooperatives and agribusiness. Special features and study approaches to agribusiness and cooperatives. Case studies. Advanced empirical issues in cooperative and agribusiness Interrelationship between cooperative and agribusiness.

AGEC 3812 Agribusiness Management
Course Objective
After completing the course, students will be well equipped with the basic concepts of Agribusiness Management and WTO.
Course Content
Definition, concepts, Important features and scope of Agribusiness Management, Elements and Functions of management; Forms of business organizations; Agribusiness financial management; Agri Marketing; Marketing
channels, functionaries and margins. Role of agri. marketing in economic development; Agricultural marketing problems. WTO, history, objectives and functions; Structure, organization and dispute settlement mechanism; Agreements under WTO; Introduction to general Agreement on Tariffs and Trade (GATT); Agreement on Agriculture (AoA); Market Access, Domestic Support, Export competition; Sanitary and Phytosanitary measures (SPS); Trade Related Intellectual Property Rights (TRIPs); Trade Related Investment Measures (TRIMs).

AGEC 3352 Principles of Microeconomics
Course Objective
After completing the course, students will be able to understand economic issues pertaining to households and firms
Course Content
Introduction, theories of demand and supply; elasticity, types, measurement and its applications; market equilibrium. Theory of consumer behavior & various approaches. Theory of producer behavior; cost,
revenue and profit functions. Market structure; perfect competition, market imperfections (monopolistic competition, pure monopoly and oligopoly). Economics of resource markets; determination of wages, rent, interest and profit.

AGEC 3452 Principles of Macroeconomics

Course Objective
After completing the course, students are supposed to have fundamental knowledge of economic issues at aggregate level.
Course Content
Basic concepts: National income and its accounting, Consumption and saving functions, Theories of Investment. Classical and Keynesian theories of income and employment. Inflationary and deflationary gaps. The Keynesian theory and the developing countries, Multiplier and acceleration principles, Business cycle theories, Inflation, its types and causes, consequences and remedies. Money and its functions, Central banks, functions, Monetary policy, its objectives and tools, Impact of Monetary policy upon consumption, investment, and government expenditure, Fiscal policy, objectives and tools, Public expenditures, taxes and national debt. Budget deficit and its consequences, Deficit financing.

AGEC 3511 Agricultural Finance Management
Course Objective
This course would help the students to develop and understanding of financial issues in agricultural sector.
Course Content
Nature and scope of agricultural finance; Capital budgeting, Credit worthiness, Agricultural credit markets; formal and informal sources of agricultural credit, Supervised Agricultural Credit, Agricultural credit policies and their problems, Role of central bank and other financial institute in agricultural financing, Risk analysis and management; insurance in agricultural sector, Micro credit and role of NGO's in agricultural lending and development.

AGEC 3611 Introduction to Natural Resource Management
Course Objective
This course will enable the students to develop understanding on issues of natural resources and sustainability in agriculture.
Course Content
Concepts of natural resources; Issues related to soil, water and environment; resource scarcity, prices, demand and supply of natural resources; Market equilibrium, economic efficiency; inter-temporal efficiency; Property rights; The economics of pollution; Natural resource exploitation; Economic approaches to conservation of natural resources; Benefit cost analysis.

AGEC 3711 Basic Econometrics
Course Objective
After completing the course, students will be in a position to apply the economic tools and techniques in the field of agricultural economics.
Course Content
Definition, scope and importance of econometrics; Basic concepts, Properties of statistical estimators; Inferences, and hypothesis testing; Regression analysis, OLS estimation of simple and multiple Regression,
Dummy variables; Specification bias and tests; Multicollinearity; Heteroscedasticity, Autocorrelation

AGR 4341 Introduction to Operations Research

Course Description
This course will introduce you to deterministic and stochastic models in operations research. You will learn to formulate, analyze, and solve mathematical models that represent real-world problems. ...

Course Objectives

By the end of the course the students should be able to: define what is meant by operations research, and account for which phases are normally part of a study applying operations research; describe the

assumptions on which linear programming (LP) is built; formulate LP models on the basis of verbal problem descriptions; solve LP problems graphically (for two variables), by using spreadsheets, and by hand using the simplex method, both algebraic and in tabular form; perform sensitivity analysis on the basis of optimal simplex tableaus, and describe the economic information that can be drawn from the analysis; formulate integer programming models and solve problems formulated using such models by using branch-and-bound or spreadsheets; formulate non-linear programming models and identify classes of non-linear programming models based on properties of the objective function and the constraint set; solve some types of non-linear problems using the method of Lagrangean multipliers, the KKT conditions, or spreadsheets; formulate and solve a number of network models

Course content

The course deals with the use of mathematical models for planning of corporate and governmental activities. Most of the planning problems will consist of an economic objective which we want to maximize under scarce resources. Operations Research consists of: - limiting and defining the current problem, - formulating a mathematical model of the problem, - calculating an optimal solution of the model, -and finally interpreting and implementing the found solution. This course deals with both deterministic and stochastic problems, and they will be analyzed based on the following models and methods: Linear and nonlinear programming, integer programming, network models, simple queuing theory and simulation. We will use spreadsheets to find numerical solutions for some of the analyzed problems.

AGEC 3641 Agricultural Policy
Course Objective
After completing the course, students will be in a position to understand the economic thought behind agricultural policies in Pakistan's perspective
Course Content
Introduction, definition of Policy, Agricultural Policy, policy goals, Layering of policy goals, Policy instruments, policy formulation, tradeoffs between goals, Land Reforms, land tenure system, Agricultural pricing policies, input-Output pricing policies, Policy of Agricultural Marketing; agro-based industries; Agri-Taxation and subsidies, Agri. Credit and finance policies, trade policies for agricultural commodities, Farm mechanization, Agri. extension, research and educational policies, Irrigation policies of Cameroon, Institutional reforms. Rural development policies; Past policies and their evaluations.

AGEC 3352 Economics of Agro-based Industries
Course Content
Role of Industries for economic development, policies and growth of Agro-based industries; performance of small & large scale industries, i.e. ginning and textile, sugar, vegetable ghee/edible oil, tobacco, fruits and
vegetables processing, beverages, wheat flour and rice mills, feed mills, etc. Efficiency, productivity and capacity utilization; Overview of Cameroon industrial policies, Quantitative & Qualitative restrictions, tariff, protection tax concessions and export subsidies, Role of public and private sectors in rural industrialization; problems of agro based industries.

AGEC 3362 Principles of Development Economics
Course Objective
After completing the course, students will be able to have knowledge about the development issues in general and developing countries in particular.
Course Content
The concepts of economic development and economic growth; characteristics of developing economies; importance and challenges of the development process. Theories of economic growth and development. Education, technological change and Economic development; Growth, Poverty and Income distribution. Economics of population and development; Importance of trade for

development; Theories of trade and development. Globalization and its implications for development, Debt burden of developing countries. Fundamental issues and development experiences in Cameroon; NGOs and Development

AGR 4352 Introduction to Microeconomics

Course Description

Introduction to Microeconomics is an introductory undergraduate course that teaches the fundamentals of microeconomics. This course introduces microeconomic concepts and analysis, supply and demand analysis, theories of the firm and individual behavior, competition and monopoly, and welfare economics. Students will also be introduced to the use of microeconomic applications to address problems in current economic policy.

Course Objectives

The objective of microeconomic theory is to analyse how individual decision-makers, both consumers and producers, behave in a variety of economic environments

Course Content

Introduction to Course and Economics; Economic Problems; Circular Flow; The Basics of Supply and Demand ; Supply and Demand: Elasticities; Consumer Behavior; Costs of Production; Pure Competition ; Monopoly; Introduction to Resource Markets; Wage Determination; etc

AGR 4372 Introduction to Macroeconomics

Course Description

Focuses on the economy as a whole (the ? macroeconomy?). Begins with the meaning and measurement of important macroeconomic data (on unemployment, inflation, and production), then turns to the behavior of the overall economy.
Course Objective

The macroeconomic policy objectives are the following: (i) **Full employment**, (ii) Price stability, (iii) Economic growth, (iv) Balance of paym ents equilibrium and exchange rate stability, and (v) Social objectives.

Course Content

Introduction to Macroeconomics, Economic Policy and the Course; Income Accounting; Unemployment and Inflation; Aggregate Demand & Supply; Classical and Keynesian Models; Equilibrium in the Keynesian Model; Fiscal Policy; Growth; Money & Banking; Multiple Expansion of Money; Federal Reserve and Monetary Policy; and Economic Stability and Policy.

AGEC 4472 Intermediate Farm Management

Course Description

This introduces students to the essentials of farm management. After the successful completion of this course, students will be introduced to more advanced aspect of farm management. Principles of farm management are presented in three modules; Module1 discussed the meaning, principles and functions of farm management.

.Course Objectives

In addition to the overall aim, this course is set to achieve some objectives.
After going through this course, you should be able to: Define farm management; Explain the principles and functions of farm management; List the special characteristic of agriculture that affect farm management decisions and proffer solutions to them; Describe some of the common concepts and tools used in farm management; Determine depreciation charge for any farm asset; Explain the meaning, list the characteristics and determine the importance of farm input resources-land, labour, capital and entrepreneur.

Course Content

The Meaning, Principles and Functions of Farm Management; The Common Concepts and Tools in Farm Management; Inputs of Farm Management; and Forms of Business Ownership.

9.3.2 Agronomy

Course Synopsis

AGRO 3621 Soil Fertility and Nutrient Management (Horticulture)
Course Description/Content
Introduction to soil fertility and productivity- factors affecting. Essential plant nutrient elements functions, deficiency systems, transformations and availability. Acid, calcareous and salt affected soils – characteristics and management. Soil organic matter, Importance of C:N ratio and pH in plant nutrition, soil buffering capacity. Integrated plant nutrient management. Soil fertility evaluation methods, critical limits of plant nutrient elements and hunger signs. NPK fertilizers: composition and application methodology, luxury consumption, nutrient interactions, deficiency symptoms, visual diagnosis. Plant nutrient toxicity symptoms and remedies measures. Soil test crop response and targeted yield concept. Biofertilizer. Nutrient use efficiency and management. Secondary and micronutrient fertilizer. Fertilizer control order. Manures and fertilizers classification and manufacturing process. Nutrient based subsidy and customised fertilizers. Properties and fate of major and micronutrient in soils. Fertilizer use efficiency and management.

AGRO 4371 Forage Crop Science
Description of Course:
This course focuses on major aspects of forage crop production and biology, for example, cultural practices, adaptation, sustainable agriculture use, seed production, harvest, livestock utilization, and storage of forages. The course especially emphasizes characteristics of important grasses and legumes.
Course Objectives and Outcomes:
At the end of the course students will be expected to understand the role of forages in sustainable food production; know the most commonly grown forages and recognize their suitability in terms of climate, soil, and livestock use; learn how forage management relates to forage production and nutritive value; realize how forages are evaluated for their value to livestock; Be able to utilize the above information to solve real problems facing livestock producers.
Course Content
Forages and Grasslands; Role of Forages in Agriculture; Forages in Relation to Animal Agriculture. Importance and Economics ; Structure and Morphology: Grasses and Morphology: Legumes; Physiology of Forage Plants; establishment of Forages; Fertility and Nutrient Management; Insect, Disease and Weed Control; Forage Improvement and Seed Production; Forage Quality; Forage Utilization; Animal Disorders in Relation to Forage. Forage Storage: Hay ; Forage Storage: Silage; Grazing Management Systems; Grazing Management Methods.

AGR 4462 Weeds & Weeds Management
Course description:
This course will emphasize the history of herbicide development; weed biology and ecology; weed control methods; herbicide-soil interactions; absorption, translocation, and metabolism of herbicides. The various herbicide families, their mode of action, toxicity, and persistence will be discussed

Course Objectives

By the end of this course, you should be able to: Synthesize knowledge, facts and information from different sources, pertaining to weed biology and management and be able to explain how they are interrelated; demonstrated through successful completion of assignments and exams; Critically assess the value of different weed management strategies; demonstrated through successful completion of assignments, exams and lab exercises; Identify 80 of Ontario's most common weeds and understand their key characteristics; demonstrated though successful completion of weed identification quiz; Identify herbicide injury through analysis of symptomology and selectivity' and Synthesize and understand facts explaining an aspect of herbicide mode of action.

Course Content

Topics to be covered in lecture include: Introduction to weeds and their biology; problems due to weeds; biological characteristics of weeds; Life cycles of weeds; seed dormancy; germination; dispersal in space and time; Vegetative reproduction; strategies for invasion; the role of weeds in succession; Competition and allelopathy, managing competition; A holistic approach to weed management; Cultural control; Biological Control; Physical and mechanical control; Herbicide formulation and application; Herbicides and soil; Herbicide uptake and movement; Herbicide metabolism and selectivity; Herbicide target sites, how do herbicides kill weeks; Photosynthesis inhibitors; Pigment synthesis inhibitors; Amino acid synthesis inhibitors; Auxin mimics; Fatty acid synthesis inhibitors; Cellulose synthesis and tubulin assembly inhibitors; Herbicide resistant crops; Herbicide resistant weeds; Future of weed management; Integrated Pest Management

AGR 4452 Integrated Pest Management

Course Description

You will begin by learning the principles of weed and disease control and the morphology and life cycles of insects, followed by comprehensive control methods, including beneficial insects. Prevention, monitoring, diagnosing, decision-making, strategy formulation and implementation will all be addressed.

Course Objectives

Upon successful completion of this course, you will be able to: Distinguish between a plant disease caused by fungi; bacteria and viruses; Discuss the effect of diseases on plant growth and development; Explain the biology and ecology of the common insects and weeds that negatively impact plants; Utilize basic management strategies to control weed, insect and disease infestations; Explain the theory, concept and purpose of Integrated Pest Management (IPM); Explain monitoring techniques and how to proactively manage pests; Apply a diagnostic process to identify the primary cause of a plant problem; Formulate and defend a control measure strategy for a specific pest scenario

Course Content

Introduction to Integrated Pest Management; Plant Pathology; Biotic Diseases; Abiotic Diseases; Entomology; Insect Pests; Weed Biology; Common Weeds; Monitoring Techniques and Action Thresholds; Diagnosis; Control Measures; Putting Integrated Pest Management to Work.

AGR 4442 Pesticides and Toxicology
Course Description
This course will include discussions about topics essential to current and future insect control efforts, such as historical use and misuse, descriptive chemistry of synthetic, "natural", botanical, and

microbial insecticidal molecules; salient features of their molecular structures explaining their metabolism and mode .

Course Objectives

Knowledge of the structural diversity of compounds designed to kill insect disease vectors and competitors for human food, fiber, and shelter; Understanding the mode of biochemical action of the different classes of compounds and how insects defend themselves against such compounds by molecular modifications of the target sites and by metabolism; Understanding the use of insecticidal compounds in IPM control strategies and how insecticide efficacy is influenced by compounds used to control weeds and pathogenic fungi; To learn the molecular structures that enable their modes of action and detoxification mechanisms, the commercial naming strategies of insecticides and the industrial strategies for discovering and devising new compounds and to appreciate their value, usefulness, limitations, and risks; This course will enable insect control professionals to make informed decisions that optimize use in specific, local situations in harmony with the abilities of insects to rapidly evolve local populations.

Course Content

This course will include discussions about topics essential to current and future insect control efforts, such as historical use and misuse, descriptive chemistry of synthetic, "natural", botanical, and microbial insecticidal molecules; salient features of their molecular structures explaining their metabolism and mode of action; the interaction between insecticides, other pesticides and commercial synergists; evolution of insecticide resistance; role of insecticides in IPM programs; environmental effects; the need for developing and using insecticides in efforts to minimize insect-vectored virus epidemics or livestock epizootics.

AGR 4432 Bio-ecology of Plant Pathogens

Course description:
Explores biology of plant pathogenic fungi, oomycetes, nematodes, bacteria, and viruses, with emphasis on identifying: 1) key traits of each pathogen class, and 2) common strategies used by these microbes. ... Plant disease clinic, field trips, lectures and lab. This course provides fundamental information on agricultural crop growth needed for understanding course content of upper level courses within the major. The major focus areas will include general crop growth and function, environmental and plant interactions in agriculture, Pests of agricultural crops, and breeding and genetics of agriculturally important crops. Upon successful completion of the course students should have a better understanding of the following topics: structural components of cells and plants; growth of tissue systems; plant interactions with their environment; physiological processes in plant growth; basic components of plant genetics; and the impact of human selection, genetic engineering, and climate modifications on plant development and food production.

Course Objectives
The objectives of this course are to: expose the students to various insect orders and their classification; teach students relevance of insect ecology in their population ; explain various insect population growths and their usefulness in population prediction ; help the students understand factors determining insect abundance; increase students knowledge of how insects communicate and behave in their effective environment
Course Content
Introduction and Course Overview; General knowledge of insect; insect Classification and phylogeny; importance of classification ; insect orders; Characteristic features for insect identification; insect of agricultural importance; insect of medical importance; Insect Ecology - Insect Population Dynamics; population characteristics; insect regulation and abundance ; population prediction and monitoring; discrete population growth; overlapping population growth. Ecosystem and agro-ecosystem -effective

environment. K-strategist insects. R-strategist insects. Insect behaviour and insect communication . Innate behavior. Learned behavior. Communication by sound. Communication by chemicals

AGR 4381 Genetics and Plant Breeding
Course Description
Plant breeding, application of genetic principles to produce plants that are more useful to humans. This is accomplished by selecting plants found to be economically or aesthetically desirable, first by controlling the mating of selected individuals, and then by selecting certain individuals among the progeny.
Course Objective
The objective is to instigate in students a broader knowledge and understanding of the *principles* and methodologies used in *plant genetics* such that they can cope in the profession.
Course Content
Classification of plants. Aims and objectives of Plant Breeding; Modes of reproduction, Sexual, Asexual, Apomixis and their classification; Significance in plant breeding; Modes of pollination, genetic consequences. Variation – heritable and non-heritable, Methods of breeding. Hybridization, Aims and objectives, types of hybridization; Incompatibility and male sterility and their utilization in crop improvement; Population improvement. Methods of breeding for vegetatively propagated crops; Clonal selection. Mutation breeding. Mendel's laws of inheritance and exceptions to the laws; Types of gene action, Multiple alleles, Pleiotropism, Penetrance and expressivity; Quantitative traits, Qualitative traits and differences between them; Multiple factor hypothesis; Cytoplasmic inheritance; Mutation and it's characteristic features; Methods of inducing mutations and C *l* B technique; Mechanisms of sex determination; Gene expression and differential gene activation; operon concept and Fine structure of Gene; DNA and RNA and their structure, function and types; Transcription, Translation, Genetic code and outline of protein synthesis; Crossing over and factors affecting it; Mechanism of crossing over and Cytological proof of crossing over; Linkage, Types of linkage and estimation of linkage.

AGRO 3201 Organic Farming
Course Objective
Upon completion of course, students should be able to conserve the environment and natural resources, reestablishing ecological balance and encourage sustainable agriculture.
Course Content.
Principles of organic farming. Use of cover crops; green manures; animal manures and crop rotation to fertilize soil. Use of biological control, crop rotation to manage weeds and other techniques for diseases and pest control.

AGRO 3241 Irrigation & Water Management
Course Objective
Upon completion of course, students will be able to calculate irrigation amount and determine when and how much to irrigate in a particular farm and crop.
Course Content
Importance of water in crop production. Soil moisture constant. Estimation of potential evapotranspiration and consumptive use. Water requirement for crop and factors affecting it. Approaches of irrigation scheduling. Systems and methods of irrigation. Quantity and quality of irrigation. Measurement of irrigation water. Elementary idea on farm drainage.

AGRO 3451 Principles & Methods of Soil & Water Conservation
Course Content
Definition, importance and history of soil conservation in agriculture. Physical properties of soil and their determination. Definition of Soil survey and land use capability classification. Measurement of distance, direction and elevation of survey. Definition, types, mechanism and causes of erosion. Factors affecting soil erosion. Agronomical practices for soil and water conservation. Engineering practices such as bunding, terracing, temporary and permanent

structures for gully control. Grassed waterways, water harvesting, shifting cultivation. Definition, objectives and uses of Remote Sensing.

AGRO 3462 Vegetable Crop Production
Course Content
Importance and scope of vegetable production. Classification of vegetables. Types of vegetable gardens. Cultivation and seed production of major vegetables like Potato, Brinjal, chillies, tomato, Cauliflower, Cabbage, Onion, Watermelon, Okra, Carrot and Pea.
Practical - Nursery raising of vegetable crops. Production of seeds in vegetable available at the time of course. Cost of cultivation studies in Potato, Tomato, Cauliflower and Okra. Production oriented training in cultivation of vegetable crops. Layout of kitchen garden.
Preparation of practical record

AGR 4401 Soil and Plant Nutrition
Course Description
The focus of this course is the influence of mineral nutrients to the health of plants. The course will examine the factors that determine the availability of mineral nutrients in soil, their uptake and use by plants. The diagnosis of soil nutrient availability and plant nutrient stress will also be examined. The interaction of mineral nutrients with biotic and abiotic stresses and the role of plant mineral nutrition in human health will also be discussed.

Course Objectives

Acquire knowledge and understanding of the chemical processes in soils that influence mineral nutrient availability; Develop an understanding of how mineral nutrients are taken up by plants, transported and assimilated by plants.; Develop an understanding of how mineral nutrients interact with important abiotic and biotic stresses; Understand the role of mineral nutrients in the quality of the harvested product.; Develop an understanding of how the nutrient status of plants is diagnosed by soil and plant analysis and the strengths and weaknesses of different methods; Acquire knowledge of the importance of fertiliser formulation to soil nutrient availability; Develop skills in sampling soil and plant tissues for routine analysis and diagnosis of nutrient status; Develop skills in interpreting the results of soil and plant analyses; Develop a critical approach to data analysis and interpretation; Promote the ability to work co-operatively as a member of a group;

Course Content
Soil testing: Principles of soil sampling and soil chemical testing to assess nutrient status of soils Behaviour of fertilizers in soils: Macro- and micronutrient fertilizers, their reactions in soils and principles of fertilizer application; Soil organic matter and soil fertility: the role of organic matter in soil fertility, managing soil organic matter, greenhouse issues and biochar use; Nutrient movement through soil and uptake by plants: How nutrients move to the root surface and the environmental influences on movement; the uptake of nutrients by roots and by leaves; Assimilation of nutrients (Macronutrients): The functions and metabolism of macronutrients and the consequences for plant growth and composition. This will be based on case studies on N and P; Assimilation of nutrients (Micronutrients): The functions and metabolism of micronutrients and the consequences for plant growth and composition. This will be based on case studies on Zn and Mn; Diagnosis of nutrient stress: The basis of plant tissue analysis; derivation of critical levels of nutrients; the strengths and weaknesses of tissue analysis; sampling issues; Nutrient balances and correction of deficiencies; nutrient use efficiency: Calculation of nutrient balances and their applications to nutrient management; alternative approaches to nutrient management; defining nutrient use efficiency, current levels of efficiency and the factors that influence nutrient use efficiency; Breeding for nutrient stress and nutrient use efficiency: Exploiting genetic variation in tolerance to nutrient stress to improve plant nutrient status and efficient use of fertiliser. Genetic control of important nutritional characteristics of plants; Plant nutrients and biotic and abiotic stress: The physiological bases of the interaction between

plant nutrient status and the ability to tolerate important abiotic and biotic stresses and how this can be exploited to manage stress in plants.

Plant nutrition, product quality and human health: The role of plant nutrition in determining the end-use quality of plant products. The role of biofortification in improving human health
Organic and recycled nutrient use: The similarities and differences of nutrient availability in organic systems; the role of water and nutrient recycling in meeting future needs

AGR 4411 Post Harvest Management & Technology
Course Description
This course provides an examination and discussion of physiological and biochemical processes unique to postharvest development and deterioration. Principles and practices of storing fruits, vegetables, and florists' and nursery stocks as well as marketing pathways for horticultural crops will be considered

Course Objective

At the end of this course, students should be able to: Have a broad knowledge about fruits, vegetables and flowers and the physiological characteristics of their development into an edible or commercially usable product; Know the physiological and biochemical changes that occur after harvest, and how such changes lead to the deterioration of the produce; Understand the strategies involved in the utilization of various technologies for the preservation of shelf life and quality; Know the impact of global trade as a consumer driven process, and its implications on the transportation and shipping of various horticultural products; Evaluate the importance of Canadian horticultural produce in global food security.

Course Content

Physiology/Biochemistry - Biological basis for postharvest practices, emphasizing biotic and abiotic factors (e.g., maturity, temperature, humidity, gaseous atmosphere, ethylene, gene action and regulation, etc.) which affect metabolism, senescence, stress-induced physiological disorders and quality of harvested horticultural products.

Postharvest Technology - Principles, application and limitation of methods and special techniques such as "common" and controlled atmosphere storage, pre-cooling, and high humidity storage; some modern instrumentation for assessing quality such as for volatile analysis, packing line technology; novel ethylene antagonists (e.g. 1-MCP), phospholipase D inhibition technology etc., to extend shelf-life of horticultural products.

9.3.3 ANIMAL SCIENCES (3rd/4th Year)

Courses Synopsis

AGR 4601 Animal Breeding and Genetics
Course Content
Classification of animals. Aims and objectives of animal Breeding; Variation – heritable and non-heritable, Methods of breeding. Artificial insemination. Mendel's laws of inheritance and exceptions to the laws; Types of gene action, Multiple alleles, Pleiotropism, Penetrance and expressivity; Quantitative traits, Qualitative traits and differences between them; Multiple factor hypothesis; Mutation and it's characteristic features; Methods of inducing mutations and C l B technique; Mechanisms of sex determination; Gene expression and differential gene activation; operon concept and Fine structure of Gene; DNA and RNA and their structure, function and types; Transcription, Translation, Genetic code and outline of protein synthesis; Crossing over and factors affecting it; Mechanism of crossing over and Cytological proof of crossing over; Linkage, Types of linkage and

estimation of linkage; Hardy-Weinberg equilibrium; Changes in gene and genotype frequencies; Genetic disorders and gene therapy.

ANSC 3501 Farming systems & Sustainable Development
Course Content
Definition, types and methods of farming. Definition, scope and advantage of sustainable agriculture. Modern agriculture in relation to sustainable agriculture. Sustainable agriculture in relation to tillage fertilizers, irrigation, weed management and plant protection measures.
Important cropping systems for sustainable agriculture.
Practical - Prepare important rotations for sustainable agriculture. Fertilizer and irrigation management for sustainable agriculture. Preparation of different models of farming systems. Preparation of cropping scheme under different Agro-climatic conditions of U.P Preparation of practical record.

ANSC 3511 Livestock Animal Production & Management
General:-Importance of farm's livestock and poultry in agriculture and Cameroon
economy. Relationships of plants with animal husbandry. Farm's livestock biodiversity (important Species & Breeds) in India and their physical characteristics. Livestock farming systems in Cameroon. Management skills- animals, land, labour and business.
Cattle and buffalo production:- Reproduction and breeding management :- Aims and objectives, male and female reproductive system, reproduction under hormonal control and development of sperm & ova. Infertility problems-causes and their possible solution. Methods and systems of livestock reproduction & breeding. Care and management of down calvers, milch cows, calves & heifers and stud bulls. Maintenance of different livestock records. Housing requirement for dairy animals.
Sheep, Goat, Pig and Poultry Production**:-** General aspects of reproduction, breeding, feeding and care & management in brief.

ANSC 3531 Animal Health & Disease Management
Course Content
Meaning of health and disease, classification of diseases. Pathogenesis and immune system. The antigens, antibiotics, antiseptics, disinfectants, and their role in disease control. The principles of spread and control of infectious diseases, knowledge of various technical terms are used when discussing infectious diseases. Elementary knowledge of prevention and control of following common diseases of livestock and poultry :- Bovine anthrax, black quarter, hemorrhagic septicaemia, Brucellosis, mastitis, foot and mouth disease, Johne's disease and disease of new born calf, worm infestation, milk fever and some other metabolic disorder. Enterotoxaemia in sheep and goat. swine fever and hog cholera in pig. Ranikhet, avian pox, Marek's disease, Gambaro disease, chronic respiratory disease, infectious coryza and fowl cholera in poultry.

AGR 4612 Non Ruminant Animal Production
Course Description

The course consists of three Parts and covers basic concept in non- ruminant animal management of Poultry, Rabbits and pigs. In this course students will study the management of breeding stocks, growing and young animals of Poultry, Rabbits and Pigs. Also study their housing, equipment and feeding principles. Production and management practices, livestock economics as well as health management of stock, processing and marketing of poultry, pigs and rabbits will be discussed. Students are exposed to diseases affecting livestock species, fish, their causative agents and preventive guide lines. They are further introduced to general biosecurity and farm sanitation methods.

AGR 4621 Ruminant and Dairy Animal Production
Course Description

This course is concerned with the husbandry and management of ruminant animals. This entails knowing the different local and some of the exotic breeds of cattle, sheep and goats in the tropics and their management principles.

Course Objective

Expose the knowledge and understanding with skill acquisition in the rearing of cattle, sheep and goats which are the common ruminants in Cameroon. The course teaches about the various breeds.

Course Content

Management of breeding animals. The management of the weaners or the weaned animals to maturity and other production purposes in terms of their feeds and feeding, health care and housing based on the system of production.

AGR 4632 Analytical Method in Animal Nutrition

Representative sampling and methods of sample preparation; proximate analysis for the determination

of dry matter, organic matter, ash, minerals, crude fat and crude fibre.

AGR 4642 Biochemistry of Animal Nutrition

Methods of biochemistry; Oxidation-reduction systems and biochemistry energetic. Energy-rich

compounds. The nature of enzymes, vitamins and coenzymes. The intermediary metabolism of

carbohydrates, fats and protein synthesis and the role of nucleic acids.

AGR 4691 Integrated Livestock Farming System
Course Objective
To familiarize on various aspects viz., scope and limitations of integrated livestock farming system, recent approach and economic feasibility of different integration models for sustainable production
Course Content
Scope and limitation of integrated farming systems - Sustainability of integrated Livestock Farming Systems and their economic importance. Integration of fish, arable farming and different livestock enterprises vis-à- vis gobal gas plant, FYM, solar and wind energy utilization, cattle, buffalo sheep, goat, pig, poultry, rabbit, silk worm, bee keeping etc. New approach for changing farming systems in present energy crises. Project formulation and evaluation of various livestock enterprises.

Practical
Various livestock farming units and their economic analysis – Evaluation of different farming systems and their economic importance ± Preparing feasibility report for various farming projects.

AGR 4661 Livestock Business Management
Course Objective
To acquaint students with knowledge in principles, planning, technical approach and preparing financial statement in Livestock Business Management and preparing projects for financing.
Course Content
Management principles - Planning - Techniques, strategic planning, organization structure, co-ordination and controlling techniques ± Approaches to management. SWOT analysis, financial accounting - Accounting records – Balance sheet, fund flow statement - Cost and analysis for managerial decisions ± Budgeting and control. Tools of financial analysis, working capital financing -

Long term financial management - Investment analysis - Capital markets - Corporate risk management - Venture capital. Marketing - Objectives, strategies - Selecting and managing marketing channels - Pricing strategies - Sales promotion - Legislation relating licensing - Company law.
Practical
Preparation of financial statements, depreciation accounting methods, trend and variance analysis, cost-volume profit analysis – Financial planning and forecasting - Estimation of working capital requirement - Break even analysis - Visit to livestock business firms and banks -
Preparing projects for financing.

AGR 4652 Applied Ethology
Course Objective
To make acquainted students on advanced concepts of farm animal behaviour with regard to environmental influence, group formation, social behaviour and behavioural adaptations under domestication.
Course Content
Recent advances and development in applied ethology, role of ethology in animal science, philosophies and ethics in ethology. Ethology in Agriculture and veterinary education, Behavioural origins and its physiology, Neuro sensory features. Thermo regulation, communicative behaviour, emotions, man animal interaction, motivation, behavioural chemistry, innate and learned aspects, Quotidian behaviour. Behavioural developments-Kinetic behaviour of the foetus and neonate, neonatal sensory developments, Imprinting, changes in group formation, bonding and play. Behaviour of maintenance-reactivity, ingestive, exploratory, kinetic, body care and territoriality. Dynamics of reproductive behaviour-nursing and maternal care. Behavioural disorders-Vices, their etiology, prevention and cure. Management of behavior.

10.0 POST GRADUATE PROGRAMMES in AGRICULTURAL ECONOMICS

10.1 Career prospects
Training opportunities are available as bankers, public servants, businessmen and women, industrialists, self employed individuals in various related fields such as agriculture, home economics, community development, insurance and other fields, to improve their knowledge for enhanced performance.

10.2 Post Graduate Diploma Programmes
The department of Agricultural Economics runs Post Graduate Diploma programmes in the following areas
  i)   Postgraduate Diploma in Farm Management and Extension
  ii) Postgraduate Diploma in Agricultural Risk Management and Insurance
  iii) Postgraduate Diploma in Agricultural Cooperatives

10.3 Philosophy
The philosophy of the postgraduate diploma programmes is to provide postgraduate training in various fields of agricultural economics for gruaduate in agricultural economics. It is also to provide non agricultural degree professionals wishing to convert to agriculture for admission into masters degree programmes in Agricultural Economics

10.4 Aims and Objectives
The postgraduate diploma programmes are aimed at:
  i)   Producing persons with advanced knowledge and skills in a particular field of agricultural economics
  ii) Exposing non agriculture professionals but in related fields to knowledge, skills and practice of farm management.

iii) Provide training in specific aspects of agricultural economics and agricultural management issues.

10.5 Admission Requirements

Candidates seeking admission for postgraduate diploma programmes in the department must have any of the following qualifications from recognized institutions:

i) Candidates must have atleast a minimum of 2 papers in A/L with passes in Chemistry, Biology or agricultural science, English language, mathematics or physics or Economics or Geography in O/L

ii) Minimum of pass degree at Bachelors level in Agriculture

Duration of postgraduate Diploma Programme

The full time postgraduate diploma programme in the department shall run for a minimum duration of two (02) semesters and maximum of four (04) semesters.

10.6 Requirements for Graduation

The programme consist of course work, project work and seminars of special topics. To be awarded the postgraduate Diploma, a candidate must fulfill the following conditions:

i) Passed a minimum of 45, 42 and 36 credit units respectively for PGD in Farm management and Extension; PGD in Agricultural Risk management and Insurance and PGD in Agricultural Cooperatives as follows

	Farm management & Extension	Agric Risk management & Insurance	Agricultural Cooperatives
Core Course	39	36	30
Project	6	6	6
Total	45	42	36

ii) Carried out a research project relevant in the area of specialization and submitted an acceptable project report

List of Courses for PGD in Farm management and Extension

Course code	Course Title	Credit Units	Examination	Semester
PGD 6011	Basic Farm Management	3		1
PGD 6022	Agricultural Development, Planning & Administration	3		2
PGD 6031	Agricultural Project Analysis	3		1
PGD 6042	Rural sociology	3		2
PGD 6051	Agricultural Extension Education	3		1
PGD 6062	Women & Youth Development Programmes	3		2
PGD 6071	Agricultural marketing & Cooperatives	3		1
PGD 6082	Agricultural Finance, Accounting & Records	3		2
PGD 6091	Statistical methods in Social Research	3		1
PGD 6102	Rural development and Leadership	3		2
PGD 6111	Extension Programme Planning, Administration & Evaluation	3		1
PGD 6122	Extension Teaching & Communication	3		2
PGD 6132	Project	6		2
	Total	45		

List of Courses for PDG in Agricultural Risk Management & Insurance

Course code	Course Title	Credit Units	Examination	Semester
PGD 6011	Basic Farm Management	3		1
PGD 6032	Agricultural Project Analysis	3		2
PGD 6141	Advanced Book keeping & Auditing	3		1

PGD 6152	Risk Management and Insurance	3		2
PGD 6161	Structure of Insurance in Cameroon	3		1
PGD 6172	Principles of Insurance	3		2
PGD 6181	Marketing Management	3		1
PDG 6192	Agricultural Finance, Accounting & Records	3		2
PGD 6201	Statistical Methods in Social Research	3		1
PGD 6212	Commercial & Cooperative Law	3		2
PGD 6221	Farm Investigation, Monitoring & Evaluation	3		1
PGD 6231	Financial Management	3		1
PDG 6251	Insurance Administration	3		1
PGD 6132	Project	6		2
		42		

List of Courses for PGD in Agricultural Cooperatives

Course Code	Course Title	Credit Unit	Examination	Semester
PGD 6021	Agricultural development, Planning & Administration	3		1
PGD 6032	Agricultural Project Analysis	3		2
PGD 6141	Advanced Book keeping & Accounting	3		1
PGD 6262	Forms, Structures & methods of Cooperatives	3		2
PGD 6272	Planning & Controlling Cooperative Businesses	3		2
PGD 6291	Communication & Personnel Management in Cooperatives	3		1
PGD 6202	Statistical methods in Social Research	3		2
PGD 6301	Comparative Cooperative Systems	3		1
PGD 6312	Commercial and Cooperative Law	3		2
PGD 6321	Cooperative Business Organisation	3		1
PGD 6132	Project	6		2
	Total	36		

10.7 Synopsis of Courses

PGD 6011 Basic Farm management
Cost and production analysis of farm operations. Investment analysis, risk and uncertainty, problems of farm management in developing countries

PGD 6181Agricultural Marketing Management
Economic and social functions of cooperatives. Office organization and management, procurement, processing and marketing of agricultural products merchandising, management appraisal

PGD 6021 Agricultural Development, Planning and Administration
Institutional framework, nature of traditional agricultural policy and programmes as they relates to agricultural modernization

PGD 6082 Agricultural Finance, Accounting and Records
Kinds and users of agricultural finance. Demand and supply of loans. Farm record analysis. Problems of records and accounting in Cameroonian farms

PGD 6132 Agricultural Project Analysis
An examination of the role of project in agricultural planning. The project office as a management and decision making unit. Stages in project management. Dimension of project management, planning, implementation and monitoring and evaluation. Criteria for and problems in project evaluation, shadow pricing and externalities, sensitivity analysis, project appraisal and planning in practice and special reference to Cameroon. Alternative approaches to project appraisal and planning in practice with special reference to Cameroon.

PGD 6202 Statistical Methods in Social Research
Classification, types and methods of collection of data in social sciences. Meanining and uses of frequency distribution, measures of central tendency, standard deviation, trends and moving as will also be introduced. Areas under a normal curve and methods of hypothesis testing

PGD 6141 Advanced Book keeping, Accounts and Auditing
Single and double entry book keeping, opening and closing accounts. Normal land mixed accounts. Valuation and depreciation of assets. Income and expense account statement. Net worth statements (Balance sheet).

PGD 6301 Comparative Cooperative Systems
Cooperatives in capitalist, socialist and developing cpuntries. Institutional and regional cooperative organizations

PGD 6262 Forms, structure and methods of Cooperatives
Agricultural producer cooperatives. Consumer cooperatives and thrift and credit cooperatives, and marketing cooperatives. Different cooperative structures, vertical and horizontal integration.

PGD 6312 Commercial and Cooperative Law
Cameroon cooperative laws and regulations. Cooperative bye laws. Statutory powers of the registrar and ministers of cooperatives. Rights and obligations of members.

PGD 6272 Planning and Controlling the Cooperative Business
Introduction, estimating sales. Estimating the cost of running, preparing monthly estimates, follow up the estimates. The number of employee, measuring staff efficient planning the working time. Allocation of tasks, measurement and induction, staff development, staff rules, check out exercises.

PGD 6321 Cooperative Business Organisations
Economic and social functions of cooperatives. Office organization and management. Procurement, processing, and marketing of agricultural products. Merchandized management appraisal.

PGD 6152 Risk Management and Insurance
Study the various types of risks and possible alternative approaches to handling such risks through insurance and other methods. Definition and nature of risk, classification, identification and measurement of risk, risk treatment alternative. The risk management process in general in relation to risk in other disciplines such as statistics, economics, law, financial management etc. definition of general nature of insurance annuities, social insurance etc marketing, staffing of the actuarial and writing claims, accounts investment, publicity, statistical and secretarial departments, staff trainingand personnel development.

PGD 6221 Farm Investigation, Monitoring and Evaluation

Farm survey, sampling and designing of instruments, selection and training of data collectors, interviewing, tabulation and analysis of data. Techniques in monitoring and evaluation, management information systems.

PGD 6161 Structure of Insurance in Cameroon
Historical development of Insurance business in Cameroon. The foreign controlled insurance companies, the central government and the insurance public problems of the indigenous insurers. The insurance intermediaries and the insuring public in Cameroon. Relation of the socioeconomic structure of a country to the growth of insurance companies. In association in Cameroon , their functions and regulations of investment, insurance seminars, government participation in the insurance industry.

PGD 6231 Financial Management
Study the principles of financial management and its employment in the maximization of the shareholders worth.; basic valuation concepts with reference to shares and debentures. Management and control of capital. Capital budgeting; long term financing decisions; financial management of mergers, bankruptcy and reorganization and portfolio theory.

PGD 6172 Principle of Insurance
Risk and insurance, need for insurance. The insurance market. Insurance policy as a local contract. Doctrine of insurance, interest, indemnity, subrogation, contribution, proximate representation and concealment insurance pricing, underwriters principles, loss and claims settlement. Government regulation of insurance.

PGD 6042 Rural Sociology
Meaning of rural sociology, terms used in sociology, Importance of rural sociology to development. Principles or theories of sociology. Settlement patterns and village organization. Rural living conditions. Types of rural economies. Rural infrastructures. Rural social institutions. Communication patterns in rural societies. Strategies to development areas.

PGD 6102 Rural Development and Rural Leadership
Concepts, principles and approaches to rural development. Rural development projects planning, organization, implementation and evaluation. Principles of administration for community /rural development. Leadership in programmes of change and rural development . selection and training of local leaders in extension and rural development programmes. Problems of rural leadership case studies.

PGD 6051 Agricultural Extension Education
Extension education process, history, philosophy and principle extension as a profession-role of change agent . extension system in Cameroon and other countries. Principles of learning and factors affecting. Characteristics of learning and factors affecting learning. Extension administration . evaluation of extension programmes. Case studies.

PGD 6301 Cooperative Management
Course Description
Course Objectives
The objective of the course is to provide the conceptual and practical understanding of cooperative management. The course will be helpful to provide the knowledge of functions, rules & regulations and the benefits of the cooperative management.

PGD 6111 Extension Programme Planning, Administration and Evaluation
The planning process, and principles of planning. How to choose local leaders, clientele involvement in planning. Basic principles and task of administration. The administrative process of evaluation.

PGD 6062 Women and Youth in Rural Development Programmes
Dynamics of rural development. Role of women in social, economic and agricultural programmes. Philosophy of women development and extension programmes. Programmes for women. Women organizations. Problems of participation of women in development programmes. Role of youths in economic and social development. Philosophy and objectives of youth development and extension programmes. Youth associations/clubs.

PGD 6122 Extension Teaching and Communication
Principles of teaching. Effective teaching in extension. Methods of teaching. Motivation and inhibition. Characteristics of adult and youth. Elements of communication. Designing models for teaching and communicating specific technologies to clients.

11.0 MASTER OF SCIENCE (MSc) DEGREE IN AGRICULTURAL ECONOMICS & AGRIBUSINESS

11.1 Philosophy
The philosophy of the masters of science in Agricultural economics and Agribusiness is to develop high level manpower to pursue careers in academics, research and business.

11.2 Aims and Objectives
This degree is aimed at:
  i)   Exposing students to advanced courses in relevant areas in agricultural economics, agribusiness, agriculture, science and other disciplines.
  ii)   Equipping students with research skills through the conduct of supervised research, seminar presentation and thesis preparation.
  iii) Producing academically competent and professionally efficient graduates who are able to manage and direct the nations agricultural economy.
  iv)   Providing courses needed for accelerated and improved communication of agricultural knowledge, skills and values to the majority of farmers and home makers.
  v)   Conducting research into the recurring problems and needs of the Cameroonian agricultural society in order to find short, medium and long terms solution.

11.3 Admission Requirement
Candidates seeking admission for the master of Science in agricultural economic and Agribusiness must have any of the following qualifications from recognized institutions
  i)   Candidates must have at least four (04) ordinary level papers with passes in Mathematics, Chemistry or physics or Economics
  ii)   Bachelors degree in Agriculture or related discipline with a minimum of second class lower division from a recognized University or Tertiary Institution
  iii) PGD in agricultural Economics

11.4 Duration of masters of Science Degree in agricultural economics and Agribusiness
  i)   A full time MSc degree programme shall run for a minimum of four (04) semesters
  ii)   A part time Msc shall run for a minimum of six (06) and maximum Eight (08) semesters.

11.5 Requirement for Graduation
The programme consists of course work, project work and seminars or special topics. To be awarded the MSc degree, a candidate must have fulfilled the following conditions
  i)   Passed a minimum of 72 credit units as below

Course	Credit units
Core courses	54
Seminar	6
Thesis	12
Total	72

ii) Carried out a research relevant to the area of specialization and submitted an acceptable thesis.

11.6 Areas of Specialization for MSc Degree in Agricultural Economics & Agribusiness

Areas of specialization for the above degree include

i) Farm Management and Production Economics
ii) Agricultural Policy and Development Planning
iii) Agricultural Business and Financial Management\
iv) Agricultural Marketing & International agriculture
v) Research in Environmental Economics

List of Courses for MSc in Agricultural Economics & Agribusiness

Course Code	Course Description	Credit Unit	Examination	Semester
7011	Microeconomic Theory	6		1
7022	Statistical Theory & Sampling Techniques	6		2
7031	Production Economics	6		1
7042	Econometrics	6		2
7051	Economic Analysis of Agricultural Projects	6		1
7061	Agricultural Marketing	6		1
7072	Macroeconomic Theory	6		2
7081	Research Methodology	6		1
7092	Agricultural Policy	6		2
7101	Seminar	6		1&2
7132	Project	12		2
	Total	72		
Electives				
7111	Agricultural Business Management	6		1
7122	Agricultural Finance & Management	6		2
7141	Household Economics	6		2
7152	Mathematical Economics	6		1
7161	Advanced Farm Management	6		2
7172	Farm Decision Theory	6		1
7181	Operations Research in Agricultural Economics	6		2
7191	Development Economics	6		1

11.7 **Courses Synopsis**

AGEC 7022 Statistics & Sampling Theory with Applications

Course description:

In this course we will discuss methods that will facilitate the design, collection and assessment of data from sample surveys. After introducing basic sampling terminology and questionnaire design, we will focus on probability sampling from finite populations, and on computing the sampling distribution of sample estimators. We will then move onto specific sampling designs such as: simple random sampling, stratified sampling, and cluster sampling. For each sampling design, we will estimate standard quantities such as totals, means, proportions, and ratios, along with their corresponding variances, and how to do sample size calculations. We will cover most of Chapters 1-10 of the textbook.

AGEC 7061 Introduction to Agricultural Marketing

Course Description

The primary purpose of this course is to help student develop analytical tools about agricultural marketing. The course covers the principles of agricultural marketing including consumers demand and supply. The course will also provide an overview of the role of agriculture in Cameroon and some world economies. Students in this course may complete a market analysis to show that they understand how managers firms, wholesalers, retailers transporters, packagers and storage, etc. function in the agricultural marketing system.

Course Objective

At the end of this course the students will be able to define agricultural marketing; identify the problems of agricultural marketing and find solutions to solve the problems; explain the principles of demand and supply; understand the relationship in the agricultural marketing system; and complete a market analysis to understand the functions of all of the actors within a marketing food distribution channel.

Course Content

The meaning of agricultural marketing; What demand is?; What supply is?; The agricultural food distribution marketing channel/ system; Role/function of the actors within the agricultural marketing system; Price and Price finding/who determines the price of a commodity?

AGEC 7092 Agricultural Policy

Course Objective

The main objectives of the course are to: analyses of the measures, economic mechanisms and required implementation of the National and Common Agricultural Policy; Interpreting the implementation mechanism of each agricultural policy measure; Description and analysis of the regulatory framework of the CAP, with a focus on the operation of the food market, through the exploitation of agricultural policy tools and mechanisms; Interpretation and evaluation of all alternative policies in the field of agriculture etc

Course Content

Basic characteristics of the agricultural sector; Agricultural Policy-Agricultural Product Policy; Interventionism in the Agricultural sector; Agricultural Economic Development; Agricultural Development Programmes; EU Mechanisms in Agricultural Policy; Common Market Organization (CMO); The Common Agricultural Policy on basic Agricultural Products; International trade mechanisms for agricultural products; Legislation; Impact of Agricultural Policy measure

AGEC 7093 Agricultural and Food Policy

Course Description:

A critical analysis of agricultural income, marketing, adjustment and trade problems and policies in the developed countries, with particular emphasis on Canadian agricultural policies.

Course Content

Course Objectives

At the end of the course, students should be able to: Clearly understand and articulate the role and function of government policy in agriculture within developing countries and in particular Cameroon; Critically outline the economic impact of types of government policies and their market, welfare and distributional impacts; Use supply-demand analysis to understand the market and welfare impacts of various government policies; Outline the role of lobby and interest groups in the government decision-making process within developing countries and in particular Cameroon; Use supply-demand analysis to understand the market and welfare impacts of various government policies on agricultural trade.

AGEC 7152 Mathematical Economics

Course Description:

The approach in the course will be mainly functional. We will learn how to apply mathematical tools to economic problems. This course is designed for students who plan to complete their undergraduate degrees or to prepare for their Master's and work as economists. This is an economics course, not a mathematics course. Students will be expected to understand and apply economic reasoning to the tools that you learn. You will also be expected to interpret your answers according to the economics underlying the question.

AGEC 7011 Microeconomic Theory

Microeconomic Theory is made up five modules of twenty units spread across fifteen lectures weeks.

Course Content

This course is basically an intermediate course on the Micro-economics aspect of economics theory.

This course builds on the knowledge gained in ECO 201. The focus here is on the use of quantitative methods in analyzing advanced macro-economics. Topics include: the theory of demand; the theory of production; cost theory, general equilibrium theory and welfare economics with particular reference to Cameroon. Microeconomic theory is quite abstract in nature, hence is one of the most challenging courses students. With this in mind this course material is to help overcome this difficulty by explaining microeconomic theory from a learn-by-doing procedure. However, you should read other current textbooks to supplement to this.

Course Objectives

At the end of the course period, the students are expected to be able to: Differentiate between the changes in quantity demanded and change in demand; explain the relationship among total revenue, marginal revenue and price elasticity with the use of graph; explain how firms transforms resources allocated (input) into product (output) and understand the circular flow of supply and demand between households and firm; explain cost concepts and calculate minimum cost that will enable a producer to produce optimally and Why the study of welfare economics is of essence to policy formulation in a country.

AGEC 7072 Macroeconomic Theory:

Course Description:

This course provides an introduction to the modern theory and practice of macroeconomics. It covers a variety of the central questions in macroeconomics including: What are the determinants of long-run economic growth? Why do economies regularly experience booms and recessions? Why is there unemployment? What determines the value of money in an economy? The course focuses particular attention on how macroeconomic policy (monetary and fiscal) affects outcomes in these dimensions, and on using the tools of the field to evaluate alternative policy responses to current events.

AGEC 7191 Development Economics

Course Description:

In a world composed of similar people, why is it that we live in relative comfort while about 1.4 billion people live on less than $1 a day? And, more importantly, what can be done about it? This course will use all the skills you have developed as an economist to try and answer these questions.

Course Content

The Neo-classical Model and Convergence of Income; Coordination and Persistent Poverty - Credit, Inequality in the Divergence of Incomes; The Psychology of Poverty; Health and Nutrition; The Role of Institutions in Development; Political Economy and Corruption; Property Rights and Investment Incentives; International Aid and Economic Growth; Microfinance; Credit, Saving and Insurance; Land Redistribution; Role of Media and Policy in Development; Social Networks and Social Capital; Role Regulation in Development; Intrahousehold Allocations and Gender and Technology Adoption and Learning

AGEC 7122 Agricultural Business Management and Finance

Course Description

This course is designed to provide essential skills needed in agricultural business management and finance.

Course Objectives

The aim of this course is to explain how to effectively and efficiently manage Agricultural business and finance in order to achieve the desired objectives. At the end of this course, you should be able to: define Agricultural business, finance, credit, marketing, planning, farm records and accounts; explain the components and various sectors of Agricultural management and management decisions; identify the types of Agricultural business management and organizations and list their characteristics, advantages and disadvantages; define production and planning; list and explain the types of production and planning, advantages and guiding principles of production planning; explain the economics of Agricultural processing and marketing; define marketing management and explain functions and problems of agricultural management; define Agricultural finance and farm credit;

explain the problems of Agricultural finance; list the criteria and sources of agricultural credit and determine the importance of keeping farm records and accounts.

AGEC 7031 Agricultural Production Economics
Course Description
Agricultural Production Economics is a one semester two (2) credit units course designed for 300 level students. The course is designed for the undergraduate students in the school of Agricultural Sciences. The course will expose you to an understanding of many concepts in Agricultural Production Economics. The knowledge gained in this course will assist you to advise farmers and policy makers on the most profitable level of farm production.
Course Content
Agricultural Production Economics consist of five major components arranged in modules: Nature of Agricultural Production Economics; Theory of Production Economics; Factor-Product Relationship; Factor-Factor and Product-Product Relationship and Production Costs

Course Objective
On successful completion of the course, you should be able to: define agricultural economics and agricultural production economics; give the various types of production function; identify time periods in production process; calculate the output and profit maximization under one variable input; explain the basic concepts involved in factor-factor relationship; calculate profit maximization under factor-factor relationship; describe the concept of product-product relationship; identify the various types of relationships between two products; define farm cost and identify the various types of farm cost; explain the various concepts of farm cost functions and explain the relationship between production function and cost functions

Agricultural Cooperatives
Course Description**:**
This course is designed to introduce students to the cooperative business model and to encourage them to think critically about why co-ops emerge, the ways in which they differ from other forms of enterprise, and how the model can be used to address current social and economic issues. The course will be participatory and will include individual and group assignments. This course is taught using a community-based learning (CBL) approach.

AGEC 7181 Operations Research
Course Description**:**
Operations research helps in solving problems in different environments that needs decisions. The module cover topics that include: linear programming, Transportation, Assignment, and CPM/ MSPT techniques. Analytic techniques and computer packages will be used to solve problems facing business managers in decision environments.
Course Objectives**:**
This module aims to introduce students to use quantitive methods and techniques for effective decisions–making; model formulation and applications that are used in solving business decision problems.
Course Content
• Introduction to Operations Research (OR); Introduction to Foundation mathematics and statistics; Linear Programming (LP), LP and allocation of resources, LP definition, Linearity requirement; Maximization Then Minimization problems; Graphical LP Minimization solution, Introduction, Simplex method definition, formulating the Simplex model; Linear Programming – Simplex Method for Maximizing; Simplex maximizing example for similar limitations, Mixed limitations; Example containing mixed constraints, Minimization example for similar limitations; Sensitivity Analysis: Changes in Objective Function, Changes in RHS, The Transportation Model; Basic Assumptions

Microeconomics
Course description
Microeconomics is the first subject of the training cycle in Economic Theory. Its importance and, at

the same time, complexity arises from the fact that it is the first time the student becomes familiar with current economic models. Over the course the student will learn to formalize economic phenomena and gain an understanding of their workings. The course covers the basic economic models of consumer theory, production theory, and partial equilibrium.

Course Content

Consumer Choice and Demand; The choice. The formal problem of maximization of preferences and derivation of the demand function; Revealed preference and Slutsky equation. Weak and strong; The Firm and the Supply Function; Supply and Demand**.**

AGEC 7131 Household Economics

Course Description

This course treats arguably the single most important institution in American society: the family. It is the source of most domestic consumption expenditure as well as most of the labor supplied to the economy. More fundamentally, it, in its many forms, is the locus of child rearing, the process by which the next generation of citizens and economic actors is created. We will employ microeconomic theory and other advanced tools to the study of the economic situation of the contemporary family.

Agricultural Risk Management

Concept and meaning of agricultural risk; Variate and non-covarite risk; Risk Management for farmers: Types of risks-price risk, yield risk, climate and weather risk, asset risk, health risk, etc. Impact of climate change and weather aberrations on crop yield and socio-economic status with special reference to arid regions; Strategies for agricultural risk management; Designing, products and programmes for combating risk, Estimation of losses. Risk avoidance and mitigation; Agricultural insurance, compensation, legislative and regulatory mechanism.

Agribusiness Financial Management

Course Objective

To impart trainings to the students regarding various aspects of financial management for agribusiness.

Course Contents

Importance, need and scope of financial management; classification and credit need in changing agriculture scenario; finance functions, investment financing; balance sheet, income statement, cash flow statement for agribusiness; Financial planning and control – assessment of financial requirement of a agribusiness unit; leverage – concept of leverage, financial and operating leverage; factor affecting capital structure, features of an optimal capital structure.

Working capital management – concept and components of working capital, need for working capital in agribusiness, management of cash and accounts receivables, and inventory for agribusiness; Capital budgeting - steps and concept of capital budgeting, appraisal criteria – payback period, average rate of return, net present value, benefit cost ratio and internal rate of return; Agri-business financing system in Cameroon - functioning of cooperative credit institutions, commercial banks, regional rural banks, Agro-Industries Corporation, etc in agribusiness financing.

Management of Agribusiness Cooperatives

Course Objective

To provide the students an understanding about the agribusiness cooperative organizations and their management.

Course Contents

Cooperative administration- a global perspective, ecology of cooperative administration, cooperative sector and economic development; Cooperative management- nature, functions and purpose of cooperatives – procurement, storage, processing, marketing, process of cooperative formation, role of leadership in cooperative management; The state and cooperative movement, effects of cooperative law in management, long range planning for cooperative expansion, policy making; Human resource management, placement and role of board of directors in cooperative management; Overview of agribusiness cooperative – credit cooperatives, cooperative marketing, dairy cooperative; financing agribusiness cooperative

AGEC 7061 Agricultural Marketing Management

Course Objective

The objective of this course is to give the students an understanding of concept, various policies, strategies and decisions relating to marketing that can be developed by agribusiness firms.

Course Contents

Meaning and scope, agricultural marketing and economic development; Agricultural market structure – meaning, components and dynamics of market structure; marketing strategy – meaning & significance, formulation of marketing strategy; agribusiness marketing environment, design of marketing mix, market segmentation and targeting, determinants of consumer's behavior; Product management - product management process and decisions, new product development – significance and classification of new product, stages and estimation of demand of new product; product life cycle; Pricing policies and practice for agribusiness - determinants of price, objectives of pricing policies and pricing methods; Promotional management - advertising planning and execution; sales promotion; grading and standardization; Distribution management - storage and warehousing and transportation management for agricultural products; marketing agencies/intermediaries – roles and functions; distribution channels involved in agribusiness.

AGEC 7232 Research Methodology

Course Objective

The objective of this course is to develop an understanding of research methodology. The focus will be on process and techniques of research.

Course Contents

Meaning, Course Objective, types, and process of research; research methodology in management-exploratory, descriptive, experimental, diagnostic, Problem formulation, setting of Course Objective, formulation of hypotheses; Scales of measurement - nominal, ordinal, interval, ratio, Likert scale and other scales; Primary and secondary data, sources of data, instruments of data collection, data editing, classification, coding, validation, tabulation, presentation, analysis; Concept of Sampling, Probability and non-probability sampling techniques including Simple Random Sampling, Stratified Sampling, Multi-stage Sampling, Systematic Sampling, Purposive Sampling, Quota sampling, judgment sampling, and convenience sampling, sample size determination, sampling and non-sampling errors. Role and uses of quantitative techniques in business decision making, Use of Equations, Use of Determinants and Matrices in business decisions, Frequency Distribution, Measures of Central Tendency, Measures of Variation, Skewness and Kurtosis, Simple, partial, and multiple correlation, rank correlation, simple and multiple regression, Discriminant and dummy variable analysis. Index Numbers, Hypothesis testing, ANOVA, Factor analysis, cluster analysis, conjoint analysis, multi-dimensional analysis etc, Report writing: Types of report, essentials and contents of good report writing

AGEC 7241 Financial Management

Course Objective

The course aims to make students proficient in concepts and techniques of financial management. Focus will be on developing understanding of the application of Financial and investment decisions.

Course Contents

Introduction to Financial Management, Its meaning and functions, Interface of financial management with other functional areas of a business. Financial Statements and Analysis - Proforma Balance Sheet and Income Statements, ratio, time series, common size and Du-Pont analysis; Capital Structure, Determinants of size and composition of Capital Structure, Capital Structure Theories; Long term financing and Cost of Capital; Working Capital Management, Determinants of Size and Composition of Working Capital, Cash and receivables management, Working Capital Management Theories, Financing of Working Capital.

Financial planning and Forecasting, Financial planning for mergers & acquisition, Capital Budgeting, Undiscounted and Discounted cash flow methods of Investment Appraisal; Hybrid finance and lease finance.

Business Financing System in India, Money and Capital Markets, Regional and All - Cameroon Financial Institutions; venture capital financing and its stages, micro finance and International financial management

AGEC 7342 Operations Research
Course Objective
The objective of this course is to acquaint the learner with the applications of some important Operations Research techniques. Focus will be on understanding the use of these techniques in solving business problems.
Course Contents
Linear Programming: Objective, Assumptions, Formulation of Linear Programming Problem, Graphic Method, Simplex method, Transportation and Assignment Problems. Inventory control Models: Costs Involved in Inventory Management, Types of Inventory, Economic Order Quantity (EOQ) Model, Continuous Review (Q) System, Periodic Review (P) System, Hybrid System, Simulation. Waiting Line Models: Waiting Line Problem, Characteristics of a Waiting-Line System, Single- Channel Model, Multiple-Channel Model, Constant-Service Time Model, Finite Population Model, Sequencing and Replacement models.
Decision making under Risk and uncertainties, Decision problem, Maximax Criterion, Maximin criterion, Minimax Regret Criterion, Laplace Criterion, Pay off Tables, Decision Trees, Expected Value of perfect Information.
Game Theory - Two -Person Zero-Sum Game, Simulation, Network analysis – PERT & CPM.

AGEC 7251 Marketing Management
Course Objective
The objective of this course is to develop an understanding of the field of marketing. The focus will be on imparting knowledge of the basic concepts, tools, and functions of marketing.
Course Contents
The Concept of Marketing Management; Marketing Environment; Marketing Mix, Strategic Marketing, Market Segmentation, Targeting, and Positioning; Buyer Behavior, Marketing Information System, Marketing Organization and Control; Marketing potential and forecasting, Classification of Products; Product Life Cycle; New Product Development; Product Line and Product Mix; Branding, Packaging and labeling; Factors affecting prices; Pricing Policies and Strategies; Pricing Methods; Types of Distribution Channels; Functions of Channel Members; Channel Management Decisions; Promotion Mix; Introduction to Advertising, Personal Selling, Sales Promotion, Publicity and Public Relations and Direct Marketing, Managing integrated marketing promotion, Customer Relationship Management.

SAINT MONICA HIGHER INSTITUTE

ENGINEERING Academic Catalog

(Programs, Policies Manual, & Student Handbook)

Table of Contents

SCIENCE AND TECHNOLOGY (SST)

The School of science and Technology offers programs which enable students to directly use principles acquired to enhance the society. The programs are geared towards making the students, not only apply existing principles, but also to be innovative.

GOALS AND OBJECTIVES

The main objectives of the School of Science and Technology are:
1. Establish a School of Science and Technology of the first rank in Cameroon.
2. Instill in its students the confidence and competence required to meet the challenges associated with careers in science and Technology.
3. Produce competitive engineers who have negotiated a well-balanced curriculum based on regional and national accreditation guidelines.

The School of Science and Technology awards the Bachelor of Engineering degrees
In: Civil and Architectural Engineering, Computer and Electrical Engineering, Industrial Engineering, Mechanical Engineering, Software Engineering, Computer Network and Telecommunication Systems Engineering and Geology & Mining Engineering; Bachelor of Science degrees in: Agriculture, Environmental Science, and Sustainable development; Master of Science Degrees in: Agriculture, Geology and mining, Geospatial information science, Environmental Science and sustainable development.

Department of technology

Civil and Architectural Engineering (BEng)
Computer and Electrical Engineering (BEng)
Industrial Engineering (BEng)
Mechanical Engineering (BEng)
Software Engineering, (BEng)
Computer Network and Telecommunication Systems Engineering (BEng)

Department of Science

Agriculture (BS and MS)
Geology and Mining (BS and MS)
Environmental Science (BS and MS)
Sustainable development (BS and MS)

PART ONE: UNDERGRADUATE PROGRAMS

Generally, every undergraduate student requires at least 180 credits to earn a bachelor's degree in SST. Each program is divided in to three categories of courses – for the sake of emphasis; this applies to all the programs in the school.

- General Education Courses
- Core Courses
- Concentration Courses
- Practical Courses

GENERAL EDUCATION COURSES

All SMHI undergraduate students are expected to take the General Education Courses (General University Requirements) irrespective of their Schools or majors. As an American-style liberal arts and sciences university, all our graduates must earn at least 48 credits in the form General Education Courses. In order to meet the General Education requirements for graduation, these 40 credits must come from four principal areas – Arts, languages, Humanities, Social Sciences and Sciences. These General Education credits can either be earned on campus or transferred from other institutions or programs. For instance, SMHI will award 8 credits for any course passed at the GCE A-Level, considering that the A-Level is the equivalence of Advanced Placement courses.

The General Education Courses will be taken during the first two years of undergraduate studies at SMHI (Freshmen/women and Sophomore Years). Students bringing in about 30 or more credits should be able to complete the General Education requirements within one year. Those who don't complete these General Education requirements within the first year will be required to take compulsory summer sessions so as to complete the remaining credits.

Objective of General Education Courses

Experience has shown that people deal with work related challenges that may not necessarily emanate from their educational areas of specialty or concentration. Hence, the purpose of General Education Courses in SMHI is to open students to a variety of work related issues in the fields of Arts, Humanities, Social Sciences and Sciences, that may enable students to handle some problems that may arise from areas beyond students' areas of concentration and specialty. Therefore, general courses are like a light that enables the students to conveniently succeed in their careers.

The following constitute the 8 General Education Courses

Course Number	Course Title	Credits
SPT100	Sports & Physical Education	2
ENG101	Use of English I	3
FRE101	Functional French I	3
ENG102	Use of English II	3
FRE102	Functional French II	3
CVE101	Civics and Ethics	3
MAT210	College Algebra	3
SET201	Introduction to Science And Technology	3
ICT211	Introduction to Computer Information System	3
ENT400	Business & Entrepreneurship	3
TOTAL CREDITS		**23**

Course Descriptions

SPT100: Sports & And Physical Education
This is a unique course designed to encourage physical fitness and creativity in students. The course is divided into two parts, the first dealing with sports and the second with creative arts. In sports, students work individually and cooperatively in various theoretical and practical aspects of sports. It provides students of varying abilities with experiences that facilitate physical, social, intellectual, cultural, spiritual and emotional growth. Meanwhile, creative arts addresses the art-forms of visual arts, creative writing, music, drama and dance.

FRE101: Introduction to French
This course is designed for students with very little or no prior knowledge of French. The course provides a lively introduction to basic oral expression, listening comprehension, and elementary reading and writing. The audio-lingual approach, using practical vocabulary drawn from realistic situations aimed at good pronunciation and ease in response.

GEN 140: College Algebra
This course is a functional approach to algebra that incorporates the use of appropriate technology. Emphasis will be placed on the study of functions, and their graphs, inequalities, and linear, quadratic, piece-wise defined, rational, polynomial, exponential, and logarithmic functions. A graphical approach will be utilized throughout, with an emphasis on solving application problems.

SET201: Introduction to Science & Technology
The course aims at demystifying scientific concepts, exposing the latest developments in science and technology, and making the subject more interesting and understanding to students. It begins by defining science and technology, and their various sub-fields, and covers a relatively new academic field that has at its core the relationship between scientific knowledge, technological systems, and society. It reflects the latest advances in the field while continuing to provide students with a road map to the complex interdisciplinary terrain of science and technology studies. Students will be engaged in topics such as environmental concerns, evolution, vaccinations, GMOs, 3-D printing, human genome project, stem cell research, drug development, GPS, robotics, renewable energy, informatics and other advances in science and technology.

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ICT211: Introduction to Computer Information Systems
This course introduces students to the basic concepts and developments in information systems. Areas of study include computer technology, information system concepts, information systems development, and the use of technology in organizations. Also included is the general nature of computer hardware, software and systems: Hands-on applications include introduction to word processing, spreadsheet, database management, and presentation software, cloud computing, web browsing and e-mail.

ENG101: Use of English I
This course emphasizes the study of grammar and composition. It introduces and explores word origins and various parts of speech to prepare students for critical reading and writing. This course also introduces students to practical applications for writing, such as business letters and memos. Equally, the course provides an analytical overview of grammar, punctuation, and sentence structure to help students improve writing skills, including writing efficiently and effectively. This course also introduces students to practical applications for writing, such as cover letters and resumes. It guides students through the steps for writing essays, from prewriting to final draft, and discusses various types of essays.

ENT400: Business & Entrepreneurship
The purpose of this course is to help students to develop the cognitive skills they need to understand the principles and mechanics that regulate everyday business life, to prepare them to deal effectively with the challenges of contemporary life, including issues in the business-society relationship, its history, world events, economic issues, and future expectations. It also examines the factors that lead towards entrepreneurial success, and the skills and behaviors necessary to be a successful entrepreneur. The course will cover design, creativity and entrepreneurship, the characteristics of and types of entrepreneurs, pathways to entrepreneurs and

requirements for success. At the end of the course, the student will be expected to develop a business plan on a business idea in the student's area of studies.

GEN 420: Fundamentals to Research Methods & Statistical Analysis
This course is designed to provide foundation knowledge of research methods commonly used. The course will prepare the student to understand material and issues associated with but not limited to the logic of the scientific method, research designs, as well as the use of statistical packages for descriptive and inferential statistics. This course will cover research processes employing quantitative and qualitative methods. Topics include ethical considerations, observational and survey research techniques, graphing, central tendency and variability, correlation and linear regression, hypothesis testing etc. Students participate in data collection, data analysis and interpretation by means of the microcomputer Statistical Package for the Social Sciences (SPSS) and in the writing of APA-style research reports.

Department of Engineering and Technology
BACHELOR OF Engineering (BEng)
Programs Objectives
- Bridge the already existing engineering gap in Cameroon by providing quality skilled and innovative engineers.
- Train engineers to be all round perfect so as to solve the designing problem in our society which were previously solved by expatriates.
- Support excellence in engineering research and evidence-based practice through collaboration, consultation, and partnerships with faculty, students, and other practicing professionals.

Career Prospects
- Working as engineers in the power, construction, oil, automotive and telecommunication companies as well as in the government. More so, all corporations, establishments, small and large businesses require IT specialist.
- Becoming a contractor
- Creating start-ups

Program Structure
To be awarded a Bachelor of Engineering Degree, a student must complete the prescribe courses and earn at least 195 credits, with at least **188** coming from core/concentration courses.

Core Courses

MAT201	Engineering Mathematics I
MAT202	Engineering Mathematics II
PHY202	Engineering Physics
SWE202	Programming I - Algorithm
MEE303	Thermodynamics
MEE203	Applied Mechanics I – Statics
MEE204	Applied Mechanics II - Dynamics
SWE301	Programming II - programming in (C, C++)
MEE301	Strength of Material
ENG301	Engineering Research Writing

Course Description

MAT201-Engineering Mathematics I

This course broaden's the ability of students in solving engineering equations and design related problems through the application of mathematical equations such as: integration, complex number, differentiation etc.

The second part of this course covers the role of statistics in engineering, probability, discrete random variables and probability distributions, continuous random variables and probability distributions, joint probability distributions, random sampling and data description, point estimation of parameters, statistical intervals for a single sample, and tests of hypotheses for a single sample.

MAT202 Engineering Mathematics II

Introduction to a broad spectrum of numerical methods for the analysis of typical mathematics, physics, or engineering problems. Topics covered include: error analysis, interpolation and polynomial approximation, numerical differentiation and integration.

Prerequisite: ENG 210

PHY202: Engineering Physics

Course work includes studying forces and motion, and the properties of matter and heat. Topics will include motion in one, two, and three dimensions, mechanical equilibrium, momentum, energy, rotational motion and dynamics, periodic motion, and conservation laws.

MEE303: Thermodynamics

The course deals with properties of a simple pure compressible substance, equations of state, the first law of thermodynamics, internal energy, specific heats, enthalpy and the application of the first law to a system or a control volume. The study of the second law of thermodynamics is also discussed leading to the discovery of entropy as a property and its ramifications. Finally, thermodynamic cycles are discussed.

MEE301: Strength of Material

A good knowledge of engineering materials i.e their resistance, states are examined in this course. The ability of a material to resist bending and share under load, it ductility. This helps students to decide which type of material to be used, with respect to its resistance. This course examines the material properties of materials used in engineering. It enable students to decide the type of material to be used with respect to their property. It also gives a good knowledge on the improvement of material properties through the use of Oxidation reaction, electroplating etc.

SWE202: Programming I - Algorithm

This course introduces students to the analysis and design of computer algorithms. Upon completion of this course, students should be able to do the following: Analyze the asymptotic performance of algorithms; Demonstrate a familiarity with major algorithms and data structures; Apply important algorithmic design paradigms and methods of analysis; Synthesize efficient algorithms in common engineering design situations.

SWE301: Programming II – Programming in (C and C++)

This course focuses on improving the creativity of students in designing and writing of programs through the use of computer software's that can be used in improving engineering applications. The programs include C++ and C.

MEE203: Applied Mechanics I (Statics)

The state and position and type of forces acting on a structural elements are examined in this course. It enables the student to decide the load pattern, material type to be used in a particular structure or force systems. Through the knowledge gotten from topic like: Equilibrium of rigid bodies, Frames and trusses, Centroid of area, Area moments of inertia etc.

MEE204: Applied Mechanics II (Dynamics) This course teaches students how to apply Newtonian physics to relatively simple physical situations. It follows on from the Statics course, but considers systems that are not in equilibrium i.e. with velocity and acceleration. Some of the topics covered are pure kinematics (a mathematical description of motion only), while others are kinetic (determine motion in problems involving the concepts of force and energy).

Areas of Concentration

Mechanical Engineering (Bachelor of Engineering in Mechanical Engineering)
The aim of the bachelor of engineering in Mechanical engineering is to train students to be able to build engines and design mechanical systems. As a mechanical engineer, he/she will create, construct and control machines. Whether it's a vehicle, an aircraft engine or an assembly line, mechanical engineers know how to make things run.

Objectives:
The objectives of the SMHI Mechanical Engineering Program are to produce graduates who, within 36 months of studies, are able to:
- Be employed as a practicing engineer in fields such as design, research, development, testing, manufacturing, operations and service systems
- assume positions of leadership and responsibility within an organization
- progress through advanced degree or certificate programs in engineering, business, and other professionally related fields

Career Prospects:
The jobs related to holders of bachelor of Engineering in Mechanical Engineering include
- Mechanical Engineer. Most industries rely on a form of mechanical systems and mechanical engineering is thought to be one of the most diverse of all engineering disciplines. As such, they will find employment opportunities in the power, manufacturing, construction and Medical industry.
- Automotive engineer. Automotive engineers design, develop and manufacture vehicles such as cars, motorbikes, buses and trucks and their engineering systems. Thus in our society, they can work in assembly plants and in companies that operate heavy duty auto machinery.
- Maintenance Engineer. Maintenance engineers are responsible for the continuous running of equipment and machinery. They use computerized systems to oversee routine maintenance and organize repairs. They will be very useful in manufacturing industries.

Concentration Courses

MEE201	Engineering Drawing and CAD I
MEE202	Engineering Drawing and CAD II
MEE206	Material Science I
MEE 307	Material Science II
MEE305	Kinematics and Dynamics of Machinery
MEE302	Computer-Aided Design and Manufacturing
MEE304	Machine Element Design
MEE308	Materials and manufacturing processes
MEE306	Fluid Mechanics
MEE401	Aircraft Engines and gas turbines
MEE403	Wiring Automation
MEE405	Systems Dynamics and Control
MEE407	Heat and Mass Transfer
MEE402	Internal Combustion Engines

MEE404   Quality Technology

MEE420   Research Project

MEE418   Design Project

Practicum Courses (48 credits)

MEE 210   WorkShop Practice I

MEE 309   WorkShop Practice II

MEE 310   WorkShop Practice III – Mechanical design and analysis

MEE 409   WorkShop Practice IV - Hydraulics and Pneumatics

MEE 402   Internal combustion Engines and gas Turbines

MEE 406   Rotating Machinery

MEE 212   Internship I

MEE 312   Internship II

Program breakdown

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1st Year								
First Semester								
2	SPT100	Sports & Physical Education	2	UR	10	0	10	20
3	FRE101	Functional French I	3	UR	20	10	0	30
4	CVE100	Civics and Ethics	3	UR	20	10	0	30
5	LAW201	Labour Law	3	C	30	0	0	30
6	ENG101	Use of English I	3	UR	20	5	5	30
7	MAT201	Engineering Mathematics I	6	C	40	20	0	60
8	MEE201	Engineering Drawing and CAD I	4	C	10	0	30	60
9	CEE201	Fundamentals of Electrical Engineering	4	C	25	10	5	40
10	MEE203	Applied Mechanics I- Statics	6	C	40	20	0	60
		Semester Total	**34**		**195**	**65**	**50**	**330**
Second Semester								
10	SWE202	Programming I – Algorithm	4	C	20	0	20	40
11	FRE102	Functional French II	3	UR	20	10	0	30
12	ENG102	Use of English II	3	UR	20	5	5	30
13	MEE204	Applied Mechanics II- Dynamics	6	C	40	20	0	60
14	MEE206	Material Science I	4	C	30	10	0	40
15	MEE202	Engineering Drawing and CAD II	4	C	10	0	30	40
16	MEE210	Workshop Practice I	6	C	0	0	60	60
17	MAT202	Engineering Mathematics II	4	C	30	10	0	40
18	MEE212	Internship I	4	C	0	0	40	40
		Semester Total	**38**		**170**	**55**	**155**	**320**
		YEAR TOTAL(Y1)	**72**		**405**	**135**	**210**	**710**
2nd Year								
Third Semester								
1	MEE305	Kinematics and Dynamics of Machinery	4	C	30	10	0	40
2	MEE303	Thermodynamics	6	C	40	20	0	60
3	MEE301	Strength of Materials	6	C	40	20	0	60

S/N	Course Code	Course Title	CV	S	L	T	P	Total
4	MEE307	Materials Science II	4	C	30	10	0	40
5	SWE301	Programming II – programming in (C, C++)	4	C	20	0	20	40
6	MEE309	Workshop Practice II	6	C	0	0	60	60
7	ENG301	Engineering Research writing	4	C	30	0	10	40
		Semester Total	34		190	60	90	340
		Fourth Semester						
8	MEE302	CAD and Manufacturing	6	C	20	10	30	60
9	MEE304	Machine Element Design	4	C	10	0	30	40
10	MEE310	Workshop Practice III	6	C	0	0	60	60
11	MEE308	Materials and manufacturing processes	6	C	40	10	10	60
12	MEE306	Fluid Mechanics	6	C	40	20	0	60
13	MEE312	Internship 2	6	C	0	0	60	60
		Semester Total	34		110	40	190	340
		YEAR TOTAL	68		300	100	280	680
		3rd Year						
		Fifth Semester						
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	MEE401	Aircraft Engines and gas turbines	6	C	40	20	0	60
2	MEE403	Wiring Automation	6	C	40	20	0	60
3	MEE405	Systems Dynamics and Control	4	C	30	0	10	40
4	MEE407	Heat and Mass Transfer	6	C	40	20	0	60
5	MEE409	Workshop Practice IV	6	C	0	0	60	60
6	ENT400	Entrepreneurship	3	C	20	0	10	30
		Semester Total	31		170	30	80	310
		Sixth Semester						
6	MEE402	Internal Combustion Engines	6	C	40	20	0	60
7	ENT400	Entrepreneurship	3	UR	20	0	10	30
8	MEE410	Workshop Practice V	6	C	0	0	60	60
9	MEE404	Quality Technology	4	C	30	0	10	40
10	MEE420	Research Project	8	C	0	0	80	80
11	MEE406	Rotating Machinery	4	C	15	10	15	40
12	MEE418	Design Project	6	C	0	0	60	60
		Semester Total	31		105	20	175	310
		YEAR TOTAL(Y3)	68		295	110	185	590
		PROGRAM TOTAL	215		960	330	670	1960

Course Description:

MEE 201: Engineering Drawing and CAD I
Students are introduced to various methods of engineering graphics, including computer aided drafting (CAD) technology and freehand sketching. Through demonstration, lab exercises and site visits, students learn the basics of graphical presentation of ideas. Specific areas include dimensioning, views, sections, production standards and tolerancing.

MEE 202: Engineering Drawing and CAD II
Focus is put on CAD. Topics in computer-aided design include CAD systems, computer graphics, geometry and computer-aided design synthesis of vehicular systems.

MEE 206: Materials science I

Crystal structure and crystal geometry phase diagrams of alloy systems, heat treatments applied to metallic materials and plain-carbon steels. Mechanical properties of metals stress-strain in metals, tensile test, hardness and hardness testing, fatigue and fracture of metals, impact test, creep of metals and creep test. Strengthening and plastic deformation of metals. Mechanical properties of ceramics, glasses, polymers and composites. Corrosion of metals. Material selection based on mechanical properties.

MEE 307: Materials science II
Students get understanding on composite materials and on polymers. Topics covered will include: Definition, history, advantages, Materials for Reinforcements, Resins, etc. Practical involves the realization of molds, etc. Deeper study of the properties of polymer materials, verification, crystallizations, TTT Diagrams.

MEE 305: Kinematics and Dynamics of Machinery
Kinematic analysis and design of cams, gears, and linkages, velocity, acceleration and force analysis, kinematic synthesis, balancing, kinematic and force analysis by complex numbers, computer-aided analysis, and synthesis of linkages.

MEE 304: Machine Element Design
Mechanical Engineering: The design of machine elements for strength requirements in consideration of various methods of manufacture. Synthesis of mechanical systems to fulfill performance requirements, following the engineering design process. Static and fatigue failure prevention. Students form groups to work on a design project.

MEE 308: Materials and Manufacturing Processes
The course gives an overview of different methods for industrial materials manufacturing processes, and of methods for forming and welding of materials. Manufacturing methods in relation to type of bonding and microstructure. Group projects and seminars illustrates different technical and chemical aspects.

MEE 306: Fluid Mechanics
The material in this course will provide the student with a fundamental background in the statics and dynamics of fluids. The basic conservation laws of mass, momentum and energy are analyzed in control volume and differential form. The student will learn how to choose the right formulation, integral vs differential, for fluid flow problems. The student will also learn how to work with different frames of reference and use them to simplify problems. Real life applications of these fundamental concepts will be introduced, with an emphasis on critical analysis of the limitations of the model used in solving the problem. Interpretation of results from experiments and numerical simulation of fluid flows will also be emphasized.

MEE 302: Computer-Aided Design and Manufacturing
Participants will study the computer-aided design and manufacturing of mechanical systems. A mechanical system will be designed including preliminary design, analysis, detail design, numerical control programming, and documentation. Applications programs will be written and interfaced to the CAD/CAM database in the manufacturing of mechanical systems. All assignments will be carried out on a CAD/CAM system.

MEE 407: Heat and Mass Transfer
Transport properties, conservation equations, conduction heat transfer, forced and natural convective heat and momentum transfer in laminar and turbulent flows, thermal radiation, mass diffusion.

MEE 402: Internal Combustion Engines
Analysis and design of gasoline and diesel engines. Fundamental processes and their application in current technology. Thermodynamics: air standard and air-fuel cycles. Combustion: stoichiometry, fuels, chemical equilibrium, chemical kinetics, flame propagation, knock, pollutant formation and control. Flow processes: volumetric efficiency, intake and exhaust tuning, two-stroke scavenging, carburetion, fuel injection, super- and turbo-charging.

404: Quality Technology

This course is aim at equipping students to carryout different types of inspection on material pieces so as to determine cracks (defects) and to calculate failure loads and fatigue crack growth lives. The student should be able to Determine cracks and their dimensions on surfaces of materials, internal parts of of material by the use of visual inspection, penetrant testing, ultra sound, magnetic particle inspection, radiography Able to measure material properties in the presence of a crack, Calculate failure loads and fatigue crack growth lives.

MEE 4351: Wiring Automation
Study the technique of analysis of an automated project, and the principles of functioning and the development of automated systems, (electromechanical) and logic cables. The following topics are included: General notions on automation, general structure, types of automated systems, numeration and coding. Technology of components, actioners, pre-actioners, sensors, central treatment units, command parts, operative parts, etc. Analysis and combinatory command, variable and logical functions, tools of system descriptions, Implication cable, Karnaugh's table, Logigrams, Boolean algebra, Elementary and complementary logical operators, minimisation of command diagrams, Realisation constraints, Pneumatical realizations, Hydraulics and electrical, Analysis and sequential commands, description by GRAFCET, types of GRAFCET, structure.

MEE 401: Aircraft Engines and Gas Turbines
Performance and characteristics of aircraft engines and industrial gas turbines, as determined by thermodynamic, fluid mechanic, heat transfer, and solid mechanic behavior of components. Operational limitations and component matching. Stress and associated temperature limits and influence of blade cooling techniques on turbines.

ENG 420: Engineering Research Project
In this course the undergraduate honors research projects will be supervised by faculty members. This project should be sustaining and could be developed in a business venture. Each student will write an independent and innovative research work, which will be supervised by a faculty member. Each student will be expected to do an independent research work and write a project which will be supervised by a faculty member. It should be well noted that, at least 90% of this project will be done by the student involved and it must be unique and innovative.

MEE 418: Mechanical Engineering Design Project
A specific, complex engineering design problem is normally taken from problem definition to product realization and testing. Emphasis is placed on documenting and reporting technical work, idea generation and selection, application of design and analysis tools developed in previous courses, project management, selling technical ideas and working in teams.

MEE 210: Mechanical Engineering Lab 1
Through a series of experiments from a number of experiments students design, perform, analyze, and report on complex prototypical engineering systems as a group. Experimental investigation of engineering systems and phenomena of interest to mechanical engineers. Design and planning of experiments. Analysis of data and reporting of experimental results.

MEE 309: Mechanical Engineering Lab 2
Laboratory emphasizing the use of fundamental principles and instrumentation systems
for the analysis and evaluation of mechanical components within a system. activities such as: Introduction to ME laboratory II, Performance test of a centrifugal pump, Performance test of a gear pump, Performance test of an impulse turbine (Pelton wheel), Drag and pressure distribution on a cylinder, Transient heat conduction in bodies of finite length, Presentation/discussion of lab reports

MEE 409: Engineering Lab IV (Hydraulics and Pneumatics)
This lab offers students, practical experience in Hydraulic and Pneumatic systems. Covered topics include:
Pneumatic and hydraulic components: compressor, cooler, compressed-air containers, filters, valves, pumps,

piping system basic circuits in pneumatics and hydraulics, design and simulation of pneumatic and hydraulic circuits, servo pneumatics and servo hydraulics, basics of servo drives, assembling, measuring techniques.

MEE410: Engineering Laboratory V (Analysis, Technology and Mechanical fabrication)
Students should be able to carry out rectification of pieces on the machine, realize and assemble mechanical pieces, have theoretical and practical notions on welding. Activities in this lab include: Fabrication project, plane rectification, cylindrical rectification. Realize the joining of pieces together by welding through arc welding or through oxy acetylene welding method.

MEE212: Internship 1
Practical experience in mechanical engineering in mechanical engineering companies

MEE312: Internship 2
Practical experience in mechanical engineering in mechanical engineering companies

Civil and Architectural Engineering
The aim of the bachelor of engineering in Civil and Architectural engineering is to be able to meet the need of a growing demand for Civil and Architectural Engineers as communities and governments continue to expect well-engineered, effective and sustainable facilities. This program has two tracts, Civil Engineering and Architectural engineering. The two tracts have many common courses.

Objectives:
The objectives of the SMHI Civil and Architectural Engineering Program is to cover the planning, design, construction and management of essential community infrastructure, including:
- commercial and industrial buildings
- water supply and wastewater systems
- irrigation, drainage and flood protection systems
- bridges, roads and transport systems
- Port harbour and airport facilities.

Career Prospects:

Civil and Architectural engineering are the oldest technical professions providing the necessary infrastructure for societies. As a Civil and architectural Engineer, you can run your own practice or work for government authorities, private industry consulting firms or major construction companies.

Concentration Courses (82 credits)

CAE 3202	Construction Materials
CAE 3152	Soils mechanics and Geotechnical Engineering
CAE 2221	Architectural drawing I
CAE 3252	Structural Engineering I (concrete)
CAE 3101	Surveying/ Elective
CAE 4101	Structural Analysis I
CAE 4351	Structural Engineering II (steel, Timber and Masonry)
CAE 4301	Hydraulics and Hydrologic Systems/Elective

MEE 4101   Fluid mechanics

CAE 4251   Prestressed concrete /Elective

CAE 4402   Water and waste water treatment

CAE 3302   Transportation Engineering

CAE 4982   Research Project

CAE 4502   Design Project

Practicum Courses (48 credits)

CAE 2132   Civil and Architectural Engineering Lab 1

CAE 3131   soils and materials laboratory I

CAE 3232   soils and materials laboratory II

CAE 4131   Engineering laboratory I (concrete tests)

CAE 4232   Engineering laboratory II (tests on cement)

CAE 4332   Engineering laboratory III

CAE 2332   Internship I

CAE 3332   Internship II

Elective Courses

CAE 4251   Building Construction Estimating

CAE 2241   Introduction to Architectural Engineering Concepts

CAE 4201   Building design

CAE 4442   Urban Planning

CAE 2432   CAD Applications for buildings P

Program Breakdown (Civil Engineering)

S/N	Course Code	Course Title	CV	S	L	T	P	Total
**1ˢᵗ Year**
*First Semester*
1	SPT100	Sports & Physical Education	2	UR	10	0	10	20
2	FRE101	Functional French I	3	UR	20	10	0	30
3	CVE100	Civics and Ethics	3	UR	20	10	0	30
4	ENG101	Use of English I	3	UR	20	5	5	30
5	MAT201	Engineering Mathematics I	6	C	40	20	0	60
6	CAE201	Civil Engineering Drawing	6	C	20	0	40	60
7	CEE201	Fundamentals of Electrical Engineering	4	C	25	10	5	40
8	CAE203	Introduction to Architectural Engineering Concepts	4	E	40	0	0	40
9	MEE203	Applied Mechanics I- Statics	6	C	40	20	0	60
		Semester Total	38		225	65	80	370
*Second Semester*
10	SWE202	Programming I – Algorithm	4	C	20	0	20	40
11	FRE102	Functional French II	3	UR	20	10	0	30
12	ENG102	Use of English II	3	UR	20	5	5	30

S/N	Course Code	Course Title	CV	S	L	T	P	Total
13	MEE204	Applied Mechanics II- Dynamics	6	C	40	20	0	60
14	CAE210	Workshop Practice I	6	C	0	0	60	60
15	MEE206	Material Science I	4	C	30	10	0	40
16	MAT202	Engineering Mathematics II	4	C	30	10	0	40
17	CAE212	Internship I	4	C	0	0	40	40
		Semester Total	34		120	40	120	280
		YEAR TOTAL(Y1)	65		345	105	200	650

2nd Year

Third Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	MEE301	Strength of Materials	6	C	40	20	0	60
2	MEE303	Thermodynamics	6	C	40	20	0	60
3	MEE307	Materials Science II	4	C	30	10	0	40
4	SWE301	Programming II – Programming in (C, C++)	4	C	20	0	20	40
5	CAE301	Surveying	6	C	40	10	10	60
6	CAE309	Workshop Practice II (soils and materials laboratory I)	6	C	0	0	60	60
7	ENG301	Engineering Research writing	4	C	30	10	0	40
		Semester Total	36		200	70	90	360

Fourth Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
8	CAE 302	Soils mechanics and Geotechnical Engineering	6	C	40	10	10	60
9	CAE 306	Construction Materials	6	C	40	20	0	60
10	CAE 304	Structural Engineering I	6	C	40	20	0	60
11	CAE310	Workshop Practice III (soils and materials laboratory II)	6	C	0	0	60	60
12	CAE 308	Transportation Engineering	4	C	30	10	0	40
13	CAE 312	Internship 2	6	C	0	0	60	60
		Semester Total	34		150	60	130	340
		YEAR TOTAL(Y2)	70		350	130	220	700

3rd Year

Fifth Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	CAE401	Structural Analysis	6	C	40	20	0	60
2	ENT400	Entrepreneurship	3	UR	20	0	10	30
3	CAE403	Pre-stressed concrete	4	C	30	10	0	40
4	CAE405	Building design	4	E	20	0	20	40
5	CAE407	Building Construction Estimating	4	E	30	10	0	40
6	CAE409	Workshop Practice IV (cement tests)	6	C	0	0	60	60
7	CAE411	Structural Engineering (steel, Timber and Masonry)	6	C	40	20	0	60
8	CAE413	Hydraulics and Hydrologic Systems	6	C	40	20	0	60
		Semester Total	39		200	80	80	360

Sixth Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
9	CAE404	Urban Planning	4	E	30	0	10	40
10	CAE406	Water and waste water treatment	4	C	30	10	0	40
11	CAE410	Engineering laboratory V (concrete test)	6	C	0	0	60	60
12	CAE420	Research Project	8	C	0	0	80	80
13	CAE418	Design Project	6	C	0	0	60	60
		Semester Total	31		80	10	220	310

YEAR TOTAL(Y3)	70		280	90	300	670	
PROGRAM TOTAL	205		975	325	720	2020	

Program Breakdown (Architecture Engineering)

1st Year								
First Semester								
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	SPT100	Sports & Physical Education	2	UR	10	0	10	20
2	FRE101	Functional French I	3	UR	20	10	0	30
3	CVE100	Civics and Ethics	3	UR	20	10	0	30
4	ENG101	Use of English I	3	UR	20	5	5	30
5	MAT201	Engineering Mathematics I	6	C	40	20	0	60
6	CAE205	Architectural Engineering Drawing	6	C	20	0	40	60
7	CEE201	Fundamentals of Electrical Engineering	4	C	25	10	5	40
8	CAE203	Introduction to Architectural Engineering Concepts	4	C	40	0	0	40
9	MEE203	Applied Mechanics I- Statics	6	C	40	20	0	60
			37		135	75	60	370
Second Semester								
`10	FRE102	Functional French II	3	UR	20	10	0	30
11	ENG102	Use of English II	3	UR	20	10	0	30
12	SWE202	Programming I – Algorithm	4	C	20	0	20	40
13	MEE204	Applied Mechanics II- Dynamics	6	C	40	20	0	60
14	CAE206	CAD Applications for buildings	4	C	15	0	25	40
15	CAE210	Civil and Architectural Engineering Lab I	6	C	0	0	60	60
16	MEE206	Material Science I	4	C	30	10	0	40
17	MAT202	Engineering Mathematics II	4	C	30	10	0	40
18	CAE212	Internship I	4	C	0	0	40	40
	Semester Total		38		135	40	145	320
	YEAR TOTAL(Y1)		76		360	105	225	690
2nd Year								
Third Semester								
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	MEE301	Strength of Materials	6	C	40	20	0	60
2	MEE303	Thermodynamics	6	C	40	20	0	60
3	MEE307	Materials Science II	4	C	30	10	0	40
4	SWE301	Programming II – Programming in (C, C++)	4	C	20	0	20	40
5	CAE301	Surveying	6	C	40	10	10	60
6	CAE309	Workshop Practice II (soils and materials laboratory I)	6	C	0	0	60	60
7	ENG301	Engineering Research writing	4	C	30	10	0	40
	Semester Total		36		200	70	90	360
Fourth Semester								
8	CAE302	Soils mechanics and Geotechnical Engineering	6	C	40	10	10	60
9	CAE306	Construction Materials	6	C	40	20	0	60
10	CAE304	Structural Engineering I	6	E	40	20	0	60
11	CAE310	Workshop Practice III (soils and materials	6	C	0	0	60	60

S/N	Course Code	Course Title	CV	S	L	T	P	Total
		laboratory II)						
12	CAE308	Transportation Engineering	4	C	30	10	0	40
13	CAE312	Internship 2	6	C	0	0	60	60
		Semester Total	34		150	60	130	340
		YEAR TOTAL(Y2)	70		350	130	220	700
		3rd Year						
		Fifth Semester						
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	CAE401	Structural Analysis	6	E	40	20	0	60
	ENT400	Entrepreneurship	3	UR	20	0	10	30
2	CAE403	Pre-stressed concrete	4	C	30	10	0	40
3	CAE405	Building design	4	C	20	0	20	40
4	CAE407	Building Construction Estimating	4	C	30	10	0	40
5	CAE409	Workshop Practice IV (cement tests)	6	C	0	0	60	60
6	CAE411	Structural Engineering (steel, Timber and Masonry)	6	C	40	20	0	60
7	CAE413	Hydraulics and Hydrologic Systems	6	C	40	20	0	60
		Semester Total	36		200	80	80	360
		Sixth Semester						
8	CAE404	Urban Planning	4	C	30	0	10	40
9	CAE406	Water and waste water treatment	4	C	30	10	0	40
10	CAE412	Workshop Practice V (concrete test)	6	C	0	0	60	60
11	CAE420	Research Project	8	C	0	0	80	80
12	CAE418	Design Project	6	C	0	0	60	60
		Semester Total	28		60	10	210	280
		YEAR TOTAL(Y3)	67		280	90	300	670
		PROGRAM TOTAL	213		990	325	745	2060

Course description

CAE306: Construction Materials:
This course focuses on the fundamental properties of construction materials (**Timbe**r: different types and species of structural timber, density-moisture relationship, strength in different directions, defects, influence of defects on permissible stress, preservation, dry and wet roots, codal provisions for design, plywood, **Bricks**: Types, standard classification, absorption, saturation factor, strength in masonry, influence of mortar strength on masonry strength, **Cement**: Components, different types, setting times, strength. **Cement mortar**: Ingredients, proportions, water demand, mortar for plastering and masonry concrete, importance of W/C Ratio, strength, ingredients including admixtures, workability, testing for strength, elasticity, non-destructive testing, mix design methods) especially those used in civil engineering projects. Fundamental concepts of materials science and engineering are introduced and applied to material`s commonly encountered in civil engineering construction, including Portland cement concrete, metals and alloys, ceramics, polymers and polymer composites, and other materials such as wood, asphalt concrete, and soils. However focus is on cements, properties of material-manufacture and properties of cement; properties of aggregates, fresh concrete, hardened concrete and methods of testing; durability of hardened concrete materials; structural behavior and movements of masonry; sustainability in civil engineering materials.

CAE302: Soils mechanics and Geotechnical Engineering
Properties of soils, classification and inter-relationship; compaction behavior, methods of compaction and their choice; permeability and seepage, flow nets, inverted filters; compressibility and consolidation, shearing

resistance, stresses and failure, soil testing in laboratory and in-situ. Stress path and applications, earth pressure theories, stress distribution in soil; soil exploration, samplers, load tests, penetration tests.

CAE205: Architectural drawing

Students will learn how to visualize and communicate three dimensional objects using a two dimensional medium. Students will develop a skill for using drawing instruments that include line weights, angular lines, French curves, circles (both template and compass), architectural scales and others. These skills will establish a basis upon which to learn computer-aided drafting. The topics in this course are: Drawing Instruments and Their Use; Multi-View Drawings; Isometric Views; Dimensioning; Plain Orthographic; Views Auxiliary; Views; Full Section Drawing; Architectural Elements; Architectural Floor Plans.

CAE304: Structural Engineering I (concrete)

Design of Reinforced Concrete Elements: Introduction to reinforced concrete structures, types of slabs, beams and columns: Limit state design philosophy: Stress-strain properties for concrete and reinforcement; Design for flexure including moment curvature, ductility and redistribution of bending moments: Empirical methods for checking serviceability (ie cracking and deflection). Design of shear reinforcement: Design of columns for axial load and bending moment. Introduction to safety, stability and Ribustness, practical design and the use of codes of practice.

CAE301: Surveying

This course introduces plane surveying techniques to civil engineering students enabling them to produce survey plans like the angles, distances, and trigonometry, Area computations, Closure, Coordinate systems (e.g., GPS, state plane), Curves (vertical and horizontal), Earthwork and volume computations, Leveling (e.g., differential, elevations, percent grades) and setout structures on construction sides.

CAE401: Structural Analysis

Analysis of statically determinate and indeterminate beams, trusses, and rigid frames; deflections by virtual-work, moment-area; influence lines; force methods; structural design loads, introduction to structural design, approximate methods.

CAE411 Structural Engineering II (Steel, Timber and masonry)

This course which is divided into three parts (steel, timber and masonry), is intended to cover the basic design of structural elements constructed of steel, masonry and timber. The course seeks to introduce the nature and inherent characteristics of masonry in relation to BS 5628 leading to nature and inherent characteristics of timber in relation to requirement of structural Eurocodes leading to a practical design and detailing of timber structural components. emphasis in this course is also put in the design of steel structures and an understanding of their structural behavior. Topics include: general objectives for design of steel structures; Eurocode 3; loads on steel building frames; floor and cladding systems for steel framed buildings; plane frame design: fabrication, joints, lateral bracing, collapse mechanisms and analysis. Element design - classification of steel sections; design and basis of capacity checks for struts and ties, trusses, restrained and unrestrained beams, columns and axial column with moments (tension/congression/local building/LTB); connection design: shear, shear and torsion connections.

CAE413: Hydraulics and Hydrologic Systems

Basic hydrology; Water cycle as related to air mass properties and movement, precipitation, evaporation, snowmelt, infiltration, stream flow, floods, and groundwater. Statistical hydrology, and hydrologic simulations-- including runoff prediction, stream flow and reservoir routing, impoundment operation studies, and urban hydrology., Basic hydraulics (e.g., Manning, equation, Bernoulli theorem, open-channel flow, pipe flow), Pumping systems (water and wastewater), Municipal water distribution systems, Reservoirs (e.g., dams, routing, spillways), Groundwater (e.g., flow, wells, drawdown).

CAE308: Transportation Engineering

This course will introduce the student to the fundamentals of transportation engineering – from planning and design to operations. The multimodal nature of transportation will be demonstrated by studying non-highway

modes. The relationship of transportation to other disciplines – even disciplines outside engineering – will become clear. Perhaps most important, the student will see how a transportation engineer can – and should – practice the profession in today's world.

CAE403: Prestressed concrete

The main objective of this course is to give students a good knowledge of the concept and theory of the use of prestressed concrete and the ability to analyze and design prestressed concrete structures. This course will focus on: Introduction to prestressed concrete, basic concept and application, advantages and types of prestressed concrete, post tensioning and pretensioning devices, properties of concrete used for prestressed concrete, prestressing steel, looses in prestressing, Analyses of members(beams, continuous beams, cantilever beams , composite beams and slabs) by stiffness method and also the flexibility method, design of members, calculation of resistance in members, prestressed compressed members.

CAE406: Water and waste water engineering

This course is divided into two parts. One part looks at the types of process that are used to purify water to a standard acceptable for distribution. The subject material is taught so as to give a fundamental understanding of the physical, chemical and biological mechanisms involved in these operations. These include: coagulation and precipitation, sedimentation, filtration and disinfection. Water quality standards relevant to water use are reviewed, along with the rationale for the adoption of such standards from the perspective of protection of public health. The other part of the module looks at the sources and types of wastewater that are generated by an industrialized society. These are considered from the viewpoint of how treatment is carried out so as to prevent environmental damage upon discharge. The taught element of the course covers the various unit operations concerned with the preliminary, primary and secondary treatment of municipal wastewaters: treatment of industrial wastewaters is also briefly mentioned as similar technologies are used, and any differences from municipal wastewater are highlighted. The treatment of the bio-solids generated as a result of wastewater treatment is critically analyzed in relation to the final disposal options.

CAE420: Civil & Architectural Engineering Research Project.

Students will present a practical and physical project in civil and environmental engineering. This design should be sustaining and could be developed in a business venture. Each student will write an independent and innovative research work, which will be supervised by a faculty member. Each student will be expected to do an independent research work and write a project which will be supervised by a faculty member. It should be well noted that, at least 90% of this project will be done by the student involved and it must be unique and innovative.

CAE418: Civil & Architectural Engineering Design Project.

Students will present a practical and physical project in petroleum engineering. This design should be sustaining and could be developed in a business venture.

CAE210: Civil and Architectural Engineering Lab 1

Through a series of three experiments from a number of experiments students design, perform, analyze, and report on complex prototypical engineering systems as a group. Experimental investigation of engineering systems and phenomena of interest to civil and architectural engineers. Design and planning of experiments. Analysis of data and reporting of experimental results.

CAE309: soils and materials laboratory I

Analyze construction materials to see that products perform as designed. Soils, aggregates, rock, Portland cement concrete, mortar, grouts, masonry products, and asphalt concrete etc.

CAE310: soils and materials laboratory II

This is a continuation of CAE 313. Analyze construction materials to see that products perform as designed. Soils, aggregates, rock, Portland cement concrete, mortar, grouts, masonry products, and asphalt concrete etc.

CAE 409: Engineering laboratory IV (concrete tests)

This lab is done to let the student get a better view on concrete by carrying out test on wet and hard concrete. For wet concrete: Slump Test – Workability; Compacting Factor and Vee- Bee Test. For hard concrete destructive and non-destructive tests are carried out.

CAE410: Engineering laboratory V (Cement Test)

This lab is design for the students to have a better understanding of construction material like cement by conduting both laboratory and field testing.

CAE212: Civil & Architectural Engineering Internship 1

Field visits to engineering companies will be carried out to expose students to practice all/some of the civil and Architectural engineering skills learned.

CAE312: Civil & Architectural Engineering Internship 2

Field visits to engineering companies will be carried out to expose students to practice all/some of the civil and Architectural engineering skills learned.

CAE407: Building Construction Estimating

Construction estimating and cost engineering fundamentals; quantity take off; pricing, bid preparation; estimating, cost accounting by computer.

CAE405: Building Design

This course is design to give Students the theoretical and practical skills that will enable them to work effectively as architectural draftspersons, CAD Technician or Building Information Modeler in the residential sector as well as the industrial and commercial building sectors. It prepares Students for specialization in residential projects, including new buildings, heritage restorations and additions or renovations or commercial and industrial projects, such as factories, motels, offices, restaurants, retail or service outlets and ware-houses. The course should provide students with skills in graphics and building construction theory required to prepare sketches and working drawings by manual and CAD techniques.

CAE404: Urban Planning

This course explores what keen urban observer and author Lewis Mumford's described as "the promise of planning." The course explores: why we plan, how we plan and the tools planners use to shape neighborhoods, cities and regions. In so doing, land use, transportation, economic analysis, housing, the role of government in planning, community-based plans, citizen-led planning and how contemporary planning can be shaped by poverty, race, and social class are examined. Often, planning involves group decision making and consensus building, and thus a secondary purpose for the course is to successfully complete a group project. A research, working in teams and through the experience of peer review will prepare each student with some of the rigors demanded of a collaborative project.

CAE203: Introduction to Architectural Engineering Concepts

The course focuses on providing an overview of the Architectural Engineering discipline and the role of an Architectural Engineer in facilitating the development and operation of an efficient built environment. Various building functions, their components and the integration of building systems in the design, construction and operation stages are introduced. Simple understanding of the building environmental requirements and the impact of socio-economic factors on the building development is initiated in this course. The latest trends in the building industry and the incorporation of modern technology and building materials in design and construction are discussed. The need for Architectural Engineer as an essential member of a building development and operation team is also highlighted.

CAE206: CAD Applications for buildings

This course deals with the basic principle of using a CAD system in the architectural or design/build industry. Topics include: layers, dimensioning, x-referencing, creating blocks and templates, plotting and three dimensional designs.

Computer and Electrical Engineering

The aim of bachelor of engineering in Electrical and Computer Engineering is to provide the study of hardware, software, communications, and the interactions between them. Its curriculum focuses on the theories, principles, and practices of traditional electrical engineering and mathematics and applies them to the design of computers and computer-based devices. Electrical and Computer Engineering students study the design of digital hardware systems including communications systems, computers, and devices that contain computers. They study software development, focusing on software for digital devices and their interfaces with users and other devices. The program emphasizes a balanced approach between hardware and software, both built on an engineering and mathematics foundation. Currently, a dominant area within Electrical and Computer engineering is embedded systems, the development of devices that have software and hardware embedded within. For example, devices such as cell phones, digital audio players, digital video recorders, alarm systems, x-ray machines, and laser surgical tools all require integration of hardware and embedded software and all are the result of computer engineering. The undergraduate program is structured to establish analytical thinking and design skills in areas such as computer architecture, digital logic design, circuits analysis, computer communication networks, digital computer control, integrated circuit engineering, digital signal processing and embedded systems.

Objectives:
The objectives of the SMHI Computer and Electrical Engineering Program is to enable students:
- Apply knowledge of mathematics, science, and engineering to solve problems.
- Analyze and interpret data.
- Design a component, a system, or a process to meet desired needs within realistic constraints.
- Function on a team and be able to communicate orally and in writing to accomplish a common goal.
- Identify, formulate, and solve engineering problems.
- Use professional ethics in making engineering decisions.
- Identify the impact of engineering solutions in a global, and economic environment.
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Career Prospects:
Electrical engineers, computer engineers, and software engineers are some of *most in-demand professionals* in Cameroon and around the world. They work in industries such as health, renewable energy, security, gaming, and telecommunications. All of career paths in electrical or computer engineering provide opportunities to work with teams of engineers and make a huge difference in the lives of people worldwide.

Concentration Courses (88 credits)
CEE202	Circuit Theory
CEE307	Digital Logic and Computer Structures
CEE301	Electrical Design and Drafting I
CEE302	Electrical Design and Drafting II
CEE304	Microprocessors and Microcontrollers
CEE411	Electrical Machines
ICT203	Computer Architecture
CEE405	Signal Processing
CEE308	Power Electronics
CEE403	Power systems and machines
CEE314	Introduction to Automatic control systems
CEE404	Numerical and Analogue feedback control system
CEE401	Electrical Power System
CEE420	Research Project

CEE418   Design Project

CEE402   CEE 4332: Fundamentals of communications systems

Practicum Courses (46 credits)

CEE210   Computer and Electrical Engineering Lab 1

CEE309   Computer & Electrical Engineering Laboratory II

CEE310   Computer and electrical laboratory III

CEE409   Computer & Electrical Engineering Laboratory IV – Microcontroller laboratory

CEE410   Electrical Laboratory

CEE212   Internship I

CEE312   Internship II

Program Breakdown

S/N	Course Code	Course Title	CV	S	L	T	P	Total
		1st Year						
		First Semester						
1	ENG101	Use of English I	3	UR	20	0	10	30
2	FRE101	Functional French I	3	UR	10	0	20	30
3	CVE100	Civics and Ethics	3	UR	20	5	5	40
5	SPT100	Sports & Physical Education	2	UR	10	0	10	20
7	MAT201	Engineering Mathematics I	6	C	40	20	0	60
8	ICT203	Computer Architecture	6	C	40	0	20	60
		Semester Total	23		170	25	35	230
		Second Semester						
9	ENG102	Use of English II	3	UR	20	0	10	30
10	FRE102	Functional French II	3	UR	10	0	20	30
11	ICT204	Discrete Mathematics	6	C	40	20	0	20
12	CEE202	Circuit Theory	6	C	40	20	0	60
13	SWE202	Programming I – Algorithm	4	C	20	0	20	40
14	CEE 2132	Workshop Practice I	6	C	0	0	60	60
15	MAT202	Engineering Mathematics II	4	C	30	0	10	40
16	CEE212	Internship I	4	C	0	0	40	40
		Semester Total	36		150	40	140	330
		YEAR TOTAL(Y1)	59		340	70	180	590
		2nd Year						
		Third Semester						
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	CEE301	Electrical Design and Drafting I	4	C	30	10	0	40
2	MEE303	Thermodynamics	4	C	30	10	0	40
3	CEE305	Analogue Electronics	4	C	30	10	0	40
4	CEE307	Digital Logic and Computer Structures	4	C	40	10	10	60
5	SWE301	Programming II – Programming in (C, C++)	4	C	20	0	20	40
6	CEE309	Workshop Practice II	6	C	0	0	60	60

7	MEE203	Applied Mechanics I - Statics	6	C	40	20	0	60
8	ENG301	Engineering Research writing	4	E	30	10	0	40
		Semester Total	**36**		**180**	**60**	**80**	**320**
		Fourth Semester						
9	CEE306	Digital Electronics	4	C	30	5	5	40
10	CEE302	Electrical Design and Drafting II	4	C	30	10	0	40
11	CEE304	Microprocessors and Microcontrollers	6	C	40	10	10	60
12	CEE308	Power Electronics	4	C	30	10	0	40
13	MEE204	Applied Mechanics II	6	C	40	20	0	60
14	CEE310	Workshop Practice III	6	C	0	0	60	60
15	CEE312	Internship 2	6	C	0	0	60	60
16	CEE314	Introduction to automatic Control systems	4	C	30	0	10	60
		Semester Total	**40**		**180**	**60**	**140**	**380**
		YEAR TOTAL(Y2)	**76**		**360**	**120**	**220**	**700**

3rd Year

		Firth Semester						
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	CEE401	Electrical Power System	4	C	30	10	0	40
2	ENT400	Entrepreneurship	3	UR	20	0	10	30
3	CEE403	Power systems and machines	4	C	30	10	0	40
4	CEE405	Signal Processing	4	C	30	10	0	40
6	CEE407	Embeded System Design	6	C	40	0	20	60
7	CEE 410	Workshop Practice IV - Micro-controllers and micro-processors	6	C	0	0	60	60
8	CEE411	Electrical Machines	4	C	30	10	0	40
		Semester Total	**31**		**200**	**40**	**100**	**340**
		Sixth Semester						
9	CEE 402	Fundamentals of Communication systems	4	C	30	0	10	60
10	CNT310	Electric and magnetic fields theory	6	C	40	0	20	60
11	CEE404	Numerical and Analogue feedback control system	6	C	40	10	10	60
12	CEE406	Discrete time linear systems	6	C	40	20	0	60
13	CEE410	Workshop Practice V	6	C	0	0	60	60
14	CEE420	Research Project	8	C	0	0	80	80
15	CEE418	Design Project	6	C	0	0	60	60
		Semester Total	**39**		**130**	**30**	**180**	**350**
		YEAR TOTAL(Y3)	**70**		**330**	**70**	**270**	**670**
		PROGRAM TOTAL	**205**		**1040**	**260**	**700**	**2000**

CEE202: Circuit Theory

This course will enable the student use basic laws and theorems to analyze and make synthesis of the components in an AC and DC circuit. It will also enable them to use methods and tools required to analyze, modelise and make synthesis of the behaviour of components found in electrotechnics system. They will be able to use the basic principles involved in three phase system. To understand the domain of analyses of RC, RL, RLC circuit with dc and ad source. The course also examines issues relating to Transients, Filters. Two port networks: characteristics and modeling of impedance, admittance, hybrid parameters and transmission network.

CEE307: Digital Logic and Computer Structures

Binary number system and arithmetic, computer codes, Boolean algebra, logic gates, K-map minimization,

sequential circuits, memory devices, state diagram and table, computer architecture, memory, Arithmetic Logic Unit, and control unit

CEE301: Electric Design and Drafting I
To demonstrate the understanding to design and draft different electrical installations and distribution networks. The course considers topics such as Basic Notion on Drafting procedures, Consumer distribution, Consumer's Circuit, Selection of Cable and Feeder, Circuit Protection, Control Devices, Wiring Systems, Electrical Lamps and Illumination.

CEE302: Electrical Design and Drafting II
The course enables students to demonstrate the understanding to design and draft electrical and communication systems, control circuit in building and assess external power requirement.

CEE304: Microprocessors and Microcontrollers
This course will enable the student to understand and demonstrate knowledge of microprocessor fundamentals, followed by application-revelant information such as ; salient feature, internal architecture, instruction set, pin configuration, and popular bits brand. Enable student understand and demonstrate knowledge of fundamentals and application related aspects, with particular reference to its comparison with a microprocessor, the general internal architecture, pin configuration, the different families and popular bits brands.

CEE411: Electrical Machines
This course is divided into three parts. Firstly, to study the fundamental principles of electrical machines and the characteristics of transformers and dc machines. On completion of this part, the student should be able possess an introduction to machine Principles, Transformers, Analysis of real transformer, the auto Transformer, DC Generators.
Secondly, to study the fundamental principles of ac machines, the characteristics and the performance of induction motors. On completion of this part, the student should be able to: Study the fundamental Principles of machines. Study the theory, operation and characteristics of induction motor. Thirdly. to demonstrate the understanding of construction, operation and performance of synchronous generators and synchronous motor

ICT203: Computer Architecture
Performance analysis and evaluation; limitations of scalar pipelines; superpipelined, superscalar and VLIW processing; parallelism in programs; memory and I/O systems; out-of-order execution; branch prediction; register and memory data flow techniques; Tomasulo's algorithm; COTS hardware accelerators, CUDA, GPU programming architecture.

CEE405: Signal Processing
This course provides a solid theoretical foundation for the analysis and processing of experimental data, and real-time experimental control methods. Topics covered include Discrete time (DT) signals; DT Linear Shift Invariant (LSI) systems; Fourier transforms; Fourier analysis for discrete time systems: DT Fourier series, DT Fourier transform, discrete Fourier transform, spectral leakage, frequency resolution, non-parametric spectral estimation. Digital filtering principles; Digital filter design; Statistical signal processing fundamentals; Practical signal processing skills in MATLAB; Applications example of digital signal processing: digital radio techniques, image compression.

CEE308: Power Electronics
Introduction to power electronics and power electrical component, power rating and heat sinking components, Power semi-conductor devices, the concept of rectification, conversion, inversion and cyclo-conversion, filters. The role of power electronics and the main domains of application. Study and protection of Power semiconductor

switches (power diode, power transistor, power thyristor, diac, triac, etc…) and implementation technique. Study of AC –X converters. Study of DC-X converters.

CEE305: Analog electronics
This course develops a basic understanding of the fundamentals and principles of analog circuits and electronic devices. It covers the key electrical variables and the application of fundamental circuit laws and theorems to DC/AC resistive circuits; the analysis of RLC circuits including resonance; the principles, construction, analysis and modelling of basic semi-conductor devices; and experimental work involving diodes, transistor amplifiers and op-amps. It includes a communication and professional skills development component.

CEE306: Digital Electronics
This course covers combinational and sequential logic circuits. Topics include number systems, Boolean algebra, logic families, medium scale integration (MSI) and large scale integration (LSI) circuits, analog to digital (AD) and digital to analog (DA) conversion, and other related topics. Upon completion, students should be able to construct, analyze, verify, and troubleshoot digital circuits using appropriate techniques and test equipment.

CEE406: Discrete time linear system
This course looks at Discrete-Time Signals and Systems Transformations of Discrete-Time Signals, Characteristics of Discrete-Time Signals, Common Discrete-Time Signals, Discrete-Time Systems, Discrete-Time Linear Time-Invariant Systems, Properties of Discrete-Time LTI Systems, Difference-Equation Models Terms in the Natural Response System, Response for Complex-Exponential Inputs, The z-Transform, LTI System Applications Fourier Transforms of Discrete-Time Signals, Properties of the DTFT Transform of Periodic Sequences, Discrete Fourier Transform (DFT) Fast Fourier Transform Applications of the DFT

CEE401: Electrical Power System
Students are expected to demonstrate the understanding of the principle of generation of electrical energy, and operation of power station. The student should also demonstrate the transmission and distribution of electrical energy. On completion of this course, the student should be able to understand the principles and methods of generation, transmission and distribution of electrical energy.

CEE407: Embedded System design
In this course, the fundamentals of embedded system hardware and firmware design will be explored. Issues such as embedded processor selection, hardware/firmware partitioning, glue logic, circuit design, circuit layout, circuit debugging, development tools, firmware architecture, firmware design, and firmware debugging will be discussed. The Intel 8051, a very popular microcontroller, will be studied. The architecture and instruction set of the microcontroller will be discussed, and a wire wrapped microcontroller board will be built and debugged by each student.

CEE420: Research Project in Computer and Electrical Engineering
In this course the undergraduate honors research projects will be supervised by faculty members. This project should be sustaining and could be developed in a business venture. Each student will write an independent and innovative research work, which will be supervised by a faculty member. Each student will be expected to do an independent research work and write a project which will be supervised by a faculty member. It should be well noted that, at least 90% of this project will be done by the student involved and it must be unique and innovative.

CEE418: Design Project
In this course a practical problem in an area of Computer and Electrical engineering is examined by the student and a concrete demonstration is made.

CEE210: Computer and Electrical Engineering Lab I
Introduction to basic measurement equipment and techniques; use of circuit simulation tools; comparison to empirical performance of simple circuits using discrete devices and circuits; simple subsystem circuit design; introduction to automated data acquisition; and laboratory technical communication.

CEE309: Computer and Electrical Engineering Laboratory II.

Prerequisites: CEE 213. Complex electronic circuit subsystem design, improving measurement system performance, impact of circuit parasitic, signal integrity, electromagnetic interference, thermal analysis, printed circuit board layout, and technical communication.

CEE314: Introduction to automatic Control systems

The course deals with: Fundamentals of control systems. Analysis and design of control systems using physical system models. State variables, steady state error, time and frequency responses, control system stability. Root locus analysis and controller design PI, PD, PID, lead lag compensator. Nyquist stability criterion.

CEE402: Fundamentals of communications systems

The course Introduces communication systems, sampling theorem, modulation theory, multiplexing, random processes for communication systems, baseband digital signaling, and related topics.

CEE310: Computer and Electrical Engineering Laboratory III -

CEE409: Computer & Electrical Engineering Laboratory IV – Microcontroller laboratory

CEE 410: Computer and Electrical Laboratory V

CEE212: Computer and Electrical Engineering Internship 1

Field visits to engineering companies will be carried out to expose students to practice all/some of the Computer and Electrical engineering skills learned.

CEE312: Computer and Electrical Engineering Internship 2

Field visits to engineering companies will be carried out to expose students to practice all/some of the Computer and Electrical engineering skills learned.

Software Engineering

This program, which is one of the ICT programs, has a slightly different set of core courses. Only four of the Engineering core courses are taken by students in this program and Telecom and Network Systems students (ENG 210, ENG 220, ENG 310, ENG 320, ENG 225 and ENG 410) which are described above.

The aim of bachelor of Engineering in Software Engineering is to bridge the gap between the huge demand of companies, which are massively adopting the world standards of going digital, and supply of software engineers. Software Engineering is about developing and managing complex software systems. It's based on mathematics and program design and involves extensive skills in coding, testing, analysis and project management. It's the degree for people who aspire to a career as a software developer

Objectives:

The Objectives of Software Engineering program at SMHI is to enable students:
- achieve comprehensive insight into engineering aspects of computer science
- study the current programming languages at an intensive level
- understand the methodology of software systems engineering using analysis and specification methods such as UML, XML, structured and soft systems methodologies
- learn to design and build systems and software using specialist engineering tools
- work within modern development environments that include Windows, Linux, mobile and cloud computing.

Career Prospects:

The need for highly skilled software engineers is growing as everyday life becomes more dependent on computers and computer systems. There exist almost uncountable opportunities for qualified graduates in Software engineering.

You could gain employment as a software developer, tester, software architect or designer. There are also team leaders, project manager and executive-level positions in software development projects.

Core Courses (44 credits)

MAT201	Engineering Mathematics I
MAT202	Engineering Mathematics 2
SWE302	Programming (C, C++)
ICT204	Discrete Mathematics
ICT201	Fundamentals of Information Technology
ICT203	Computer Architecture
ICT301	Information Systems
ICT401	Network Security
ICT303	Data base management system
ICT302	Information and coding theory

Program Breakdown

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1st Year								
First Semester								
1	SPT100	Sports & Physical Education	2	C	10	0	10	20
2	CVE100	Civics and Ethics	3	C	10	0	20	30
3	FRE101	Functional French I	3	C	20	5	5	30
4	ENG102	Use of English I	3	C	20	5	5	30
5	MAT201	Engineering Mathematics I	6	C	40	20	0	60
	ENG201	Engineering Physics	4	C	30	10	0	40
6	ICT201	Fundamentals of Information Technology	4	C	30	0	10	40
7	ICT203	Computer Architecture	6	C	40	0	20	60
		Semester Total	31		170	30	70	270
Second Semester								
8	ICT204	Discrete Mathematics	6	C	40	20	0	60
9	FRE102	Functional French I	3	C	20	5	5	30
10	ENG102	Use of English I	3	C	20	5	5	30
11	SWE204	Web Technologies	6	C	40	0	20	60
12	SWE206	Computer Programming I	4	C	30	0	10	40
13	MAT202	Engineering Mathematics II	4	C	30	0	10	40
14	ICT206	Operating Systems	4	C	20	0	20	40
15	SWE202	Programming I – Algorithm	4	E	20	0	20	40
16	SWE212	Internship I	4	C	0	0	40	40
		Semester Total	38		210	30	120	360
		YEAR TOTAL(Y1)	69		380	60	190	630
2nd Year								
Third Semester								
S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	SWE303	Introduction to Unix	4	C	30	5	5	40
2	SWE 307	Computer programming II	6	C	40	10	10	60

3	SWE301	Programming II - Programming in (C, C++)	4	E	20	0	20	40
4	SWE305	Object Oriented Programming	6	C	40	10	10	60
5	ICT301	Information Systems	6	E	40	0	20	60
6	ICT303	Data base management system	6	C	40	10	10	60
7	ENG301	Engineering Research writing	4	C	30	10	0	40
		Semester Total	36		240	45	75	360
		Fourth Semester						
8	ICT302	Information and coding theory	4	C	30	10	0	40
9	CEE306	Digital Electronics	4	C	30	5	5	40
10	SWE302	Systems Programming	6	C	40	20	0	60
11	SWE304	Software Entrepreneurial Project 1	4	C	0	0	40	40
12	SWE306	Advanced Data Structures and Algorithms	6	C	40	10	10	60
13	SWE308	Advanced Database management system	6	C	40	10	10	60
14	SWE312	Internship 2	6	C	0	0	60	60
		Semester Total	36		180	55	125	360
		YEAR TOTAL(Y2)	72		420	100	200	720

3rd Year

Fifth Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	SWE 401	Software Engineering	4	C	30	10	0	40
2								
3	SWE403	Mobile Device programming	6	C	40	20	0	60
4	SWE405	Microprocessor and Embedded Programming	6	C	40	0	20	60
5	SWE407	Software Engineering Practice	6	C	10	0	50	60
6	ICT401	Network Security	6	C	40	10	10	60
7	SWE409	Software Entrepreneurial project 2	6	C	0	0	60	60
		Semester Total	34		160	40	140	340
		Sixth Semester						
8	SWE402	Programming Language and Paradigm	4	C	30	10	0	40
9	ENT400	Entrepreneurship	3	UR	20	0	10	30
10	CNT310	Transmission of information	4	C	30	5	5	40
11	SWE404	Compiler design	4	C	30	0	10	40
12	SWE420	Research Project	8	C	0	0	80	80
13	SWE418	Design Project	6	C	0	0	60	60
		Semester Total	29		110	15	165	290
		YEAR TOTAL(Y3)	63		270	55	305	630
		PROGRAM TOTAL	204		1070	215	695	1980

ICT204: Discrete Mathematics

This course introduces the study of finite systems as an increasingly important concept in the computer age and a founding pillar in information technology. The digital computer is basically a finite structure, and many of its properties can be understood and interpreted within the frame work of Finite Mathematical Systems. The course covers formal mathematical objects like Sets, Graphs, Matrices, recurrence relations and examines how these objects arise in computer science- related problems.

ICT201: Fundamentals of Information Technology

This course introduces students to the technologies that are fundamental in the gathering, processing, representation and storage of information. Based on the fact that students have been interacting with some of these technologies in their everyday activities, the course paints a formal picture of the concepts of Data,

Information, Hardware (Input and Output), Software and Networks. Practical aspects will be on modern information representation technologies (HTML).

ICT203: Computer Architecture

This course introduces the micro components that are interconnected for the functioning of a computer system. Very little emphasis is placed on the physics and electronics involved. The course covers the functioning of logic gates and combinational circuits and how they are used to implement Boolean functions which can be analyzed with truth tables and K-maps. Introductory notions in sequential circuits, timing diagrams and the design of registers and state diagrams are equally covered. Additional topics may include in a descriptive manner, the interconnections between combinational circuits (ALU, controllers, etc) sequential circuits (Registers, RAM, ROM, etc), Buses (data, address and control) and peripheral devices in a computer system. It equally introduces assembly programming using basic commands only

ICT301: Information Systems

This course introduces the concepts of information systems as used in businesses and covers areas like definition, classification, components of a computer-based Information Systems, the place and role of Information Systems in various management structures and at various levels of management as well as analysis of IS. Introduction to database concepts are equally covered. Students will practice working with ISs and be able to perform simple create, read, update and delete operations on computer-based information systems.

Furthermore, this course teaches students how to design, construct, test, and debug databases using an Integrated Development Environment (IDE). Emphasis is on the design of databases that meet the needs of its users as well as the methodology used.

ICT401: Network Security

The course covers theory and practice of computer security, focusing in particular on the security aspects of the web and Internet. It surveys cryptographic tools used to provide security, such as shared key encryption (DES, 3DES, RC-4/5/6, etc.); public key encryption, key exchange, and digital signature (Diffie-Hellmann, RSA, DSS, etc.). It then reviews how these tools are utilized in the internet protocols and applications such as SSL/TLS, IPSEC, Kerberos, PGP, S/MIME, SET, and others (including wireless). System security issues, such as viruses, intrusion, and firewalls, will also be covered.

ICT303: Data base management system

Database Management Systems will concentrate on the principles, design, implementation and applications of database management systems. The aim is to let students: understand the different issues involved in the design and implementation of a database system; To study the physical and logical database designs, database modeling, relational, hierarchical, and network models; To understand and use data manipulation language to query, update, and manage a database; To develop an understanding of essential DBMS concepts such as: database security,
integrity, concurrency, distributed database, and intelligent database, Client/Server
(Database Server), Data Warehousing; To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

ICT302: Information and coding theory

This is intended to be a straightforward and accessible course on information theory. Information theory is the mathematical theory that deals with the fundamental aspects of communication systems. As such, its primary goal is not to deliver practical solutions to communications problems, but rather to answer the question whether encoding and decoding schemes exist or not for a given combination of a source model and a channel model. The two main outcomes of single-user information theory are that any source requires a minimum description rate to represent its output faithfully (source coding theorem) and that any channel is characterized by a

maximum transmission rate above which the probability of error cannot be made arbitrarily small (channel coding theorem). The purpose of this course is to develop the fundamental ideas of information theory and to indicate where and how the theory can be applied.

Concentration Courses

SWE206	Computer programming 1
SWE303	Introduction to Unix
SWE305	Object Oriented Programming
SWE204	*Web Technologies*
SWE302	Systems Programming
SWE401	Software Engineering
SWE403	Mobile Device Programming
SWE402	Programing Language and Paradigm
SWE407	Software Engineering Practice
SWE404	Compiler design
SWE420	Research Project
SWE418	Design Project

Practicum Courses

ICT206	Operating Systems
SWE307	Computer programming II
SWE308	Advanced Database management system
SWE304	Entrepreneurial project 1
SWE409	Entrepreneurial project 1
SWE212	Internship I
SWE312	Internship II

SWE 206: Computer programming 1

This course introduces students to the area of computer programming, taking into consideration the fact that this might be the first course on computer programming that the student is encountering in his / her educational career. Emphasis shall be placed on algorithmic thinking, algorithm representation and introduction to a specific programming language.

SWE303: Introduction to Unix

This course covers UNIX file and operating system. It equally covers an understanding of multi-user and multitasking concepts. Editors, X-windows, Awk, email, Internet commands, shell commands and shell scriptsare also treated in this course. Projects, which provide practical experience, are completed as part of the homework requirements.

SWE305: Object Oriented Programming

This course introduces students to the object oriented programming paradigm and concepts such as classes, objects, methods, interfaces, packages, inheritance, encapsulation, and polymorphism. Emphasis is on the application of these concepts to practical problems. A prerequisite for this course will be a D+ in the Computer programming II course.

SWE204: Web Technologies

This course covers the technologies that are involved in the representation of information on the web. Technologies such as Hyper Text Mark-up Language (HTML), Cascade Style Sheet (CSS), JavaScript for client-side scripting and a server-side scripting programming language such as PHP will be covered from a practical perspective.

SWE302: Systems Programming

This course trains students on the issues involved in developing system-dependent applications. Topics such as file manipulations, working with vendor and third party programmers' libraries (static and dynamic), programming for specific hardware, device driver and network programming are treated within this course. The course is project based.

SWE401: Software Engineering

This course provides an academic backing to software engineering concepts which students would have exploited during the work experience course. The course delves into questions like: Why do so many software projects fail? What are the leading software development technical and management practices? What can be done to extract maximum value from technical reviews? Etc. It covers the traditional phases of software engineering such as: specification, requirement, design, implementation, verification and validation, documentation and packaging.

SWE403: Mobile Device Programming

The course aims at giving students the tools to design and develop mobile apps, and publishes them online mobile application stores. It provides an introduction to mobile phone and tablet development in general, and a good understanding of the Android, the iOS or the windows platform in particular; and also the concept of hybrid apps. The diverse resource constrained hardware environments, the large number of software platforms, and quickly changing APIs are among the features that make mobile development challenging and rewarding. Therefore, topics such as file manipulations, interaction with programmable features of a mobile device, working with vendor and third party programmers' libraries (static and dynamic) and interfacing with mobile device are treated within this course. The course is project based.

SWE402: Programing Language and Paradigm

Programming language design issues and programming paradigms. Binding and scoping, parameter passing, lambda abstraction, data abstraction, type checking. Functional and logic programming.

SWE407: Software Engineering Parctice

Software engineering practice in industry, related to the design and commissioning of large software systems. Ethical, social, economic, safety and legal issues. Metrics, project management, costing, marketing, control, standards, CASE tools and bugs. The course involves a large team project.

SWE404: Compiling Design

Computer Science (Sci): The structure of a compiler. Lexical analysis. Parsing techniques. Syntax directed translation. Run-time implementation of various programming language constructs. Introduction to code generation for an idealized machine. Students will implement parts of a compiler.

SWE420: Software engineering Research Project

In this course the undergraduate honors research projects will be supervised by faculty members. This project should be sustaining and could be developed in a business venture. Each student will write an independent and innovative research work, which will be supervised by a faculty member. Each student will be expected to do an

independent research work and write a project which will be supervised by a faculty member. It should be well noted that, at least 90% of this project will be done by the student involved and it must be unique and innovative.

SWE418: Software Engineering Design Project
Application for independent study approved by the instructor and the ICT Coordinator. Independent study or research under the direction of a full-time faculty member.

ICT206: Operating Systems
This course covers the various generations of operating systems software as well as future trends in operating systems. It equally covers the boot process of a computer and the how the operating system executes its functions after boot-up. Students will practice how to install and exploit different operating systems (Disk partitioning and management of Software installations; System backup and recovery; Systems upgrade). This course is treated as a practical course.

SWE307: Computer programming II
This course is a follow up of the computer programming I course. It deepens the student's knowledge in computer programming through rigorous exercises / mini projects and covers topics like data types, data structures, programmer-defined data types, pointer, dynamic data structures and memory management from a programming perspective. A prerequisite for this course will be a D+ in computer programming I.

SWE308: Advanced Database management system
Advanced Database Management Systems course deals with the usage as well as concepts of design and architecture of databases. In covering the concepts, theorems, algorithms and proofs relevant to different aspects (design, architecture and implementation) are covered. The general approach is go through design, architecture (storage and indexes), core features (transactions, concurrency), and specialized database usage (data-mining, data-warehousing, distributed databases). The practical work done in the course goes through usage of some advanced SQL features and the implementation of some algorithms and coding of internals of an actual database system.

SWE306: Advanced Data Structures and Algorithms
This course provides a rigorous view into data structures and algorithms as used in computer programming. Though practical exercises, the course explores traditional and contemporary problems in data structures and algorithms, performance analysis as well as algorithm optimizations. Topics include search tree construction, tree balancing techniques, algorithms from graph theory and computational geometry, string matching algorithms, skip lists and hash tables, and techniques for parallel algorithms.

SWE304 & SWE 407: Entrepreneurial project 1 & 2
The students will conceive and launch a software product or service using the principles of "Lean Startup". The entrepreneurship project includes the development of a prototype and a business plan for a startup. Entrepreneurship projects are typically completed in teams of 2-4 students. This course will cover two semesters.

SWE212: Software Engineering Internship 1
Field visits to software companies will be carried out to expose students to practice all/some of the Software engineering skills learned.

SWE312: Software Engineering Internship 2
Field visits to software companies will be carried out to expose students to practice all/some of the Software engineering skills learned.

SWE405: Microprocessor and Embedded Programming
Students are supposed to demonstrate knowledge and understanding of the fundamental principles embedded systems design, explain the process and apply it; demonstrate knowledge and understanding of the microcontroller technology both for hardware and software; design embedded systems based on

microcontrollers; demonstrate knowledge and understanding of Hardware/Software codesign techniques for microcontroller based embedded systems, apply techniques in design problems; program microcontrollers in C using Integrated Development Environments and using debugging techniques; know and classify microcontrollers peripherals; know, understand and explain low-power technology and Interrupt mechanisms; Design and implement a complete embedded system as a project. Topics may include: Introduction to Embedded Systems; Microcontroller architectures; MSP430 Instruction set, Addressing modes; Interrupt signals and routines; Interface circuits; Analog and Digital Peripherals programming: Digital I/Os, Timers, ADC and Communication , Peripherals, Low power modes of operation

Network and Telecom System Engineering

As the computers and computer systems increase, this program aims at being at the fore front to supply personnel who will be at the forefront of manning their communications specializing in design, implementation, integration and application of programmable and/or reconfigurable computers/devices or computer-based systems.

Objectives:

The objectives of this program is to enable students apply knowledge and skills so as to find better solutions to engineering challenges in design, construction and maintenance of software and hardware components of computing and computer-controlled devices, equipment and systems including those used in:

- communication networks and automation of electrical and electronic systems
- audio and visual information acquisition, processing and communications
- human-machine interaction, industrial or medical instrumentation and monitoring
- provision of security for computer systems and networks.

Thus the Network and Telecom system engineer, design, implement and maintain the digital communication networks that surround us. In this program, network engineering looks at technology, audio and visual communications over wired and wireless networks, optimizing network performance and network security.

Program Breakdown

S/N	Course Code	Course Title	CV	S	L	T	P	Total
		1ˢᵗ Year						
		First Semester						
1	ENG101	Use of English I	3	UR	10	0	10	20
2	FRE101	Functional French I	3	UR	10	0	20	30
3	SPT100	Introduction to French	3	UR	20	5	5	30
4	CVE100	English Grammar & Composition	2	UR	20	5	5	30
5	MAT201	Engineering Mathematics I	6	C	40	20	0	60
6	ICT201	Fundamentals of Information Technology	4	C	30	0	10	40
7	ICT203	Computer Architecture	6	C	40	0	20	60
		Semester Total	27		170	30	70	270
		Second Semester						
8	ICT 204	Discrete Mathematics	6	C	40	20	0	60
9	ENG102	Use of English II	3	UR	10	0	10	20
10	FRE102	Functional French II	3	UR	10	0	20	30
12	ENG201	Engineering Physics	4	C	30	10	0	40
13	CNT202	Computer Networks and Communication Technologies	4	C	30	10	0	40

S/N	Course Code	Course Title	CV	S	L	T	P	Total
14	MAT202	Engineering Mathematics II	4	C	30	0	10	40
15	ICT206	Operating Systems	4	C	20	0	20	
14	SWE202	Programming I – Algorithm	4	C	20	0	20	40
15	CNT212	Internship I	4	C	0	0	40	40
		Semester Total	36		210	40	110	360
		YEAR TOTAL(Y1)	63		380	70	180	630

2ⁿᵈ Year

Third Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	CNT301	Routing and Switching	6	C	40	0	20	60
2	SWE301	Programming II - Programming in (C, C++)	4	C	20	0	20	40
3	ICT303	Data base management system	6	C	40	10	10	60
4	CNT303	Telecommunication Systems I	6	C	40	0	20	60
5	ENG301	Engineering Research writing	4	E	30	10	0	40
6	ICT301	Information Systems	6	E	40	0	20	60
		Semester Total	32		210	20	90	320

Fourth Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
7	CNT302	Numerical Analysis	6	C	40	10	10	60
8	CNT304	Spectral Analysis of Signals	4	C	30	10	0	40
9	CNT306	Advanced Routing and Switching	6	C	40	10	10	60
10	ICT308	Information and coding theory	4	C	30	10	0	40
11	CNT314	Telecommunication Systems II	6	C	40	10	10	60
12	CNT310	Electric and magnetic fields theory	6	C	40	0	20	60
13	CNT 312	Internship 2	6	C	0	0	60	60
		Semester Total	38		220	50	110	380
		YEAR TOTAL(Y2)	70		430	70	200	700

3ʳᵈ Year

Fifth Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
1	CNT401	Transmission of information	6	C	40	10	10	60
	ENT400	Entrepreneurship	3	UR	20	0	10	30
2	CNT403	Mobile Networks	4	C	30	0	10	40
3	ICT401	Network Security	4	C	30	5	5	40
5	CNT409	Entrepreneurial Project	6	C	0	0	60	60
6	SWE401	Software Engineering	4	C	30	10	0	40
		Semester Total	27		170	25	105	300

Sixth Semester

S/N	Course Code	Course Title	CV	S	L	T	P	Total
7	CNT402	Administering Network Infrastructure	4	C	20	0	20	40
8	CNT404	Antennas and Propagation	4	C	30	5	5	40
10	CNT406	Access Network	6	C	40	0	20	60
11	CNT420	Research Project	8	C	0	0	80	80
12	CNT418	Design Project	6	C	0	0	60	60
		Semester Total	28		80	0	190	180
		YEAR TOTAL(Y3)	55		280	30	295	610
		PROGRAM TOTAL	188		1090	170	680	1940

Course Description:

CNT202: Computer Networks and Communication Technologies

This course covers the different layers of the OSI reference model and the TCP/IP model with emphasis on the role of each layer; describing transmission techniques, media and protocols associated to each layer as well as network topologies. Other topics such as Address classes and sub-netting will be introduced in this course. A prerequisite for this course will be a D+ in the introduction to information technology course.

CNT302: Numerical Analysis

This course covers some elementary numerical methods that are frequently used in computations. Topics such as errors and mistakes in computation, iterative solutions to equations, interpolation, Gaussian elimination, numerical integration and differentiation, etc.shall be covered in this course. A prerequisite for this course will be a D+ in the Mathematics II course

CNT303: Telecommunication Systems I

This course introduces students to the basic components of a telecommunication system covering topics such as Telecommunications networks and standards; Electrical signals, frequencies and modulation; analogue and digital transmissions; switch size and link capacity; queuing systems in telecommunications; digital networks and signaling techniques.

CNT314: Telecommunication Systems II

This course is a continuation of the Telecommunication systems I course. It covers topics such as local and long-distance networks; Enterprise networks; concepts in transmission transport; CCITT signaling system No. 7; Voice over IP in packet Switched networks as well as community antenna television (Cable TV). A prerequisite of this course will be a D+ in the Telecommunications Systems I course.

CNT310: Electric and magnetic fields theory

This course is design to teach students the effects of electric charges at rest and in motion. Both positive and negative charges produce force field which is called "electric field". Moving charges produce current, which gives rise to another force field called "magnetic field". The electromagnetic theory studies the behavior of the electric and magnetic fields.

CNT406: Access Networks

This course covers the fundamentals structure and role of access networks within a telecommunication system. Emphasis is on the feeder and distribution layers of access networks, the structure and role in a telecommunication system. The course equally covers the various technologies (Wired and Wireless) available for providing connectivity to telecommunication networks from a descriptive and configuration standpoint.

CNT403: Mobile Networks

This course provides an academic backing to mobile communications and wireless networks which students would have worked with during the work experience course. It presents the wireless and mobile network architectures, technologies and protocols. Topics covered include cellular and mobile IP concepts multiple-access methods, spread spectrum modulation, and different wireless network protocols such as WiFi, WiMAX and Bluetooth. It equally introduces the various wireless 1G, 2G, and 3G platforms, architecture, and protocols.

*** Internet of Things***

Students will gain an overview of key concepts and challenges related to digital transformation through an examination of the evolution of the Internet and how the interconnection of people, processes, data, and things is

transforming every industry.

CNT306: Advanced Routing and Switching
The aim of this module is to introduce you to the concepts of routing, using a global addressing system to facilitate routing and the function and implementation of the different routing protocols that may be operated across a network.

CNT420: Research Project in Computer Network and Telecommunication Systems
In this course the undergraduate honors research projects will be supervised by faculty members. This project should be sustaining and could be developed in a business venture. Each student will write an independent and innovative research work, which will be supervised by a faculty member. Each student will be expected to do an independent research work and write a project which will be supervised by a faculty member. It should be well noted that, at least 90% of this project will be done by the student involved and it must be unique and innovative.

CNT418: Design Project in Computer Network and Telecommunication Systems
Application for independent study approved by the instructor and the ICT Coordinator. Independent study or research under the direction of a full-time faculty member.

ICT206: Operating Systems
This course covers the various generations of operating systems software as well as future trends in operating systems. It equally covers the boot process of a computer and the how the operating system executes its functions after boot-up. Students will practice how to install and exploit different operating systems (Disk partitioning and management of Software installations; System backup and recovery; Systems upgrade). This course is treated as a practical course.

CNT304: Spectral Analysis of Signals
The course reviews classical and modern methods and algorithms for computer-based spectral analysis of signals. Also, it gives an overview of various applications in communications, systems engineering, radar, and biomedicine.

CNT401: Transmission of information
This course offers an introduction to the quantitative theory of information and its applications to reliable, efficient communication systems. Topics include mathematical definition and properties of information, source coding theorem, lossless compression of data, optimal lossless coding, noisy communication channels, channel coding theorem, the source channel separation theorem, multiple access channels, broadcast channels, Gaussian noise, and time-varying channels.

CNT301: Routing and Switching
This course introduces configuration routers and switches to build multiprotocol internetworks. OSI reference model, basic LAN and WAN design, dial access services, TCP/IP protocol suites, IP addressing, subnetting, static and dynamic routing, and WAN technologies such as HDLC, PPP, Frame Relay, ATM and ISDN.

CNT402: Administering Network Infrastructure
Network infrastructure administration concepts and methods including installing, configuring and troubleshooting remote access, remote access security, network protocols and monitoring.

CNT409: Entrepreneurial project in Computer Network and Telecom Systems

The student will undertake an individual project that will demonstrate his/her understanding of computer networks. S/he can select his/her own area of study, and then will identify and develop a realistic problem and, working independently and in a professional manner, organise, sustain and report on your project in a way which is both detailed and reflective.

CNT212: Computer Network and Telecommunication Systems Internship 1
Field visits to Network companies will be carried out to expose students to practice all/some of the CNTengineering skills learned.

CNT312: Computer Network and Telecommunication Systems Internship 2
Field visits to Network companies will be carried out to expose students to practice all/some of the

CNTengineering skills learned.

CNT404: Antennas and Propagation
Antennas and propagation effects play a crucial, even though often overlooked, role in RF systems. In practice, the design of a working system such as mobile phone networks, WiFi, RFID, Satellite communication and GPS requires a good understanding of these components. This course teaches the fundamentals of antenna and propagation and shows the application in practical examples. The course covers the theory of radiation, fundamental antenna parameters and concepts, wire antennas such as dipoles and loop antennas, antenna arrays, aperture antennas (e.g. horns), microstrip antennas, numerical analysis, communication & radar systems and propagation effects.