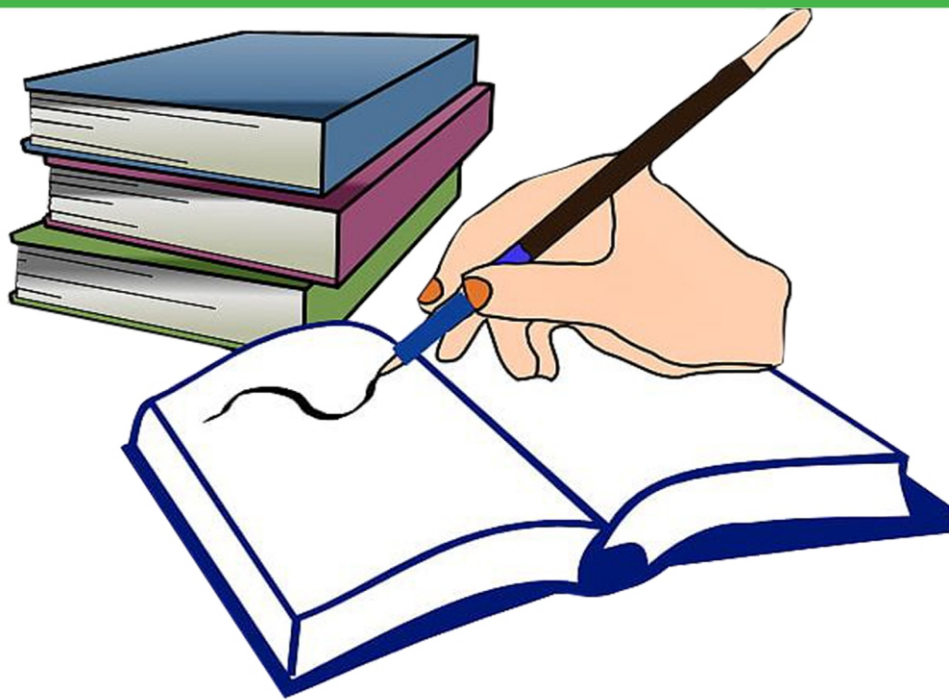


West African Centre for Water, Irrigation & Sustainable Agriculture (WACWISA)

University for Development Studies



**TEACHING & RESEARCH STUDENT GUIDELINES FOR
MASTERS AND DOCTOR OF PHILOSOPHY PROGRAMMES**

STUDENTS GUIDE/HANDBOOK

2019

WACWISA Students Guide-Handbook



PREFACE

This handbook provides guidelines for West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA) students. It is an addendum to the main University for Development Studies Graduate Students Handbook and the Junior Member Rules and Regulations. This handbook provides easy access to current information on the regulations governing WACWISA and graduate studies in the University for Development Studies; the entry requirements and programmes offered in the various Departments and Faculties/Schools for prospective graduate students that are under the coordination of WACWISA as well as the policy guidelines for WACWISA Scholarships. More detailed information can, however be found in Faculty/School and the Graduate School handbooks. Additionally, information regarding the conduct of examinations and the behaviour of students on and off campus is provided in the Graduate School handbook as well as the Junior Members Regulations and Sexual Harassment Policy of the University, which can be found on the University's website (www.uds.edu.gh).

During the 88th regular meeting of the University Council in 2019, approval was given for the establishment of the West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA) as a semi-autonomous Centre in the University. The Centre focuses on world-class training at the graduate level (Masters and PhD), tailor-made short courses and conduct of high impact research that addresses the development needs of the West Africa sub-region and the African Continent largely. WACWISA training of high-level manpower is in the following subject areas:

- - Irrigation Science and Engineering,
- - Integrated Water Resources and Environmental Management, and;
- - Sustainable Agricultural and Food Systems.

The Centre is envisioned to “be a leading world-class academic and research Centre specialized in irrigation, water resources and sustainable agriculture”. It will use a practically-oriented, student centred, research focused, problem-based learning and coaching as core pedagogy. Training methods is mainly competence and research-based modular system.

WACWISA will also undertake cutting-edge research through joint local and international research linkages, cross-border and trans-boundary research, graduate students research and post-doctoral fellowships. The post-doctoral positions will be the first of its kind in the University and this is expected to increase the research portfolio of the Centre and the University in general. WACWISA will also enhance research ties by creating a research sector platform between industry and academia.

Ing. Prof. Felix K. Abagale
(DIRECTOR)

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1.0 GENERAL INFORMATION

1.1 Introduction

This student handbook is designed as first-hand information for persons seeking to pursue or are currently pursuing Graduate studies under WACWISA at the University for Development Studies (UDS). It also serves as guide to supervisors and examiners of postgraduate programmes under WACWISA in UDS.

1.2 Contacts

1.2.1 Director

West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA)

University for Development Studies

Post Office Box TL 1882, Tamale-Ghana

Phone: +233(0)20 666 3484 or 0264869838

E-mail: director_wacwisa@uds.edu.gh or fabagale@uds.edu.gh

1.2.2 Deputy Director, WACWISA

University for Development Studies

Post Office Box TL 1882

Tamale-Ghana, Phone: +233(0)244-467142

E-mail: novagordanak@gmail.com

1.2.3 Academic Programmes Coordinator, WACWISA

University for Development Studies

Post Office Box TL 1882, Tamale-Ghana

Phone: +233(0)243-888 331

E-mail: sganiyu@uds.edu.gh

1.2.4 Research Coordinator, WACWISA

University for Development Studies

Post Office Box TL 1882, Tamale-Ghana

Phone: +233(0) 244547795

E-mail: slynsor@yahoo.com

1.2.5 Administrative Coordinator, WACWISA

University for Development Studies

Post Office Box TL 1882, Tamale-Ghana

Phone: +233(0) 244573657

E-mail: alanben@uds.edu.gh

Visit our Website: <http://wacwisa.uds.edu.gh/> or Main UDS Website: www.uds.edu.gh

2. BRIEF OVERVIEW OF WACWISA

2.1 Introduction

The West Africa Centre for Water, Irrigation and Sustainable Agriculture (WACWISA) is one of the World Bank African Centre of Excellence Impact (ACE Impact) projects established in January 2019 in the University for Development Studies, Ghana. The Centre focuses on training irrigation experts, agricultural water managers and agriculturalists capable of developing and managing new irrigation and drainage systems, as well as improving water and agricultural knowledge and technologies in the region. The Centre is envisioned as being “a leading world-class academic and research Centre specialized in irrigation, water resources and sustainable agriculture” aimed at training high level manpower in irrigation science and engineering, integrated water resources and environmental management and sustainable agricultural and food systems. The Centre's training programmes is practically-oriented, student centred, research focused, problem-based using coaching as core pedagogy. The curricula for MPhil and PhD programmes of the Centre have been designed with strong academic, research and practical background in the various disciplines with the aim to produce graduates who can fit into industry to meet national and international needs upon graduation.

2.2 Vision and Mission of WACWISA

The vision of WACWISA is “to be a leading world-class academic and research Centre specialized in irrigation, water resources and sustainable agriculture”.

Its mission is to “develop skills and knowledge of individuals to provide practical and sustainable solutions to the challenges of irrigation and agricultural development in the West African sub-region”.

2.3 Aims and Objectives

It aims to train the manpower in irrigation technology who will be capable of developing and managing new irrigation and drainage systems, as well as improving water and agricultural systems in the region. Specifically, it will:

- Build capacities at Masters and PhD levels focusing on Irrigation & Drainage Engineering, Integrated Water Resources and Environmental Management as well as Sustainable Agricultural and Food Systems;
- Undertake applied and advanced research contributing to new and emerging knowledge and technologies;
- Develop localized and sustainable irrigation and water resources technologies;
- Design and undertake skills gap training using tailor-made irrigation, and sustainable agricultural water management training programmes for industry;
- Support international quality teaching and learning and help produce technically capable graduates who can meet future challenges in irrigated and sustainable agriculture in the sub-region and internationally.

3. COORDINATION OF GRADUATE PROGRAMMES UNDER WACWISA

3.1 The Office of the Director of WACWISA

The Office of the Director of WACWISA has oversight implementation responsibilities for the overall co-ordination of programmes and routine activities of the Centre. He ensures that the programmes that are run under WACWISA follow strictly the laid down structures of the Graduate School of UDS. The Office of the Director of WACWISA therefore work hand-in-hand with the Office of the Dean of Graduate School of UDS to ensure that application and admission processes and academic wellbeing and progressions of students under the Centre are in tune with the mandate of the Graduate School. In addition, it has the oversight responsibility of monitoring and evaluation of programmes administered by Departments to promote and ensure quality.

3.2 Coordination of Graduate Programmes

The Academic Programme Coordinator of WACWISA facilitates selection of qualified candidates as well as oversees students' welfare. He/she also liaise with the Campus level Graduate programmes Coordinators of the various Faculties whose programmes are run under the Centre to ensure effective teaching, learning and supervision for on-time completion and graduation of candidates.

3.3 Academic and Research Supervisors/Advisors

WACWISA shall constitute academic and research advisors from both UDS and other collaborating institutions in Ghana and abroad who:

- Shall be selected on the basis of their specializations and research outputs in the student's area of research;
- Shall be responsible for guiding the student in the thesis development;
- Mentor students on the academic progression;
- Serve as internal examiners of the completed thesis;

3.4 Faculties and School offering Graduate Programmes under WACWISA

- Faculty of Agribusiness and Communication Sciences
- School of Engineering

4. GUIDELINES FOR FACULTY AND GRADUATE STUDENTS

4.1 Registration

- Registration of courses shall be done in full in the First, Second and Third Trimesters of each academic year. Courses may however be changed or added in consultation with academic supervisors or advisors.
- Students are to register for all previously trailed or unregistered courses offered in the preceding Trimester or academic year before adding any prescribed courses to obtain the minimum approved total credit units for the trimester.

4.2 Re-sit of Examinations

- Any failed course must be re-registered and the paper(s) retaken at the next opportunity as specified by the Department.

4.3 Interruption of Study Programme (Deferment of Programme)

A student who wishes to interrupt the study programme must apply in advance through the Department/Faculty/School Board to WACWISA's Academic Programme Coordinator who will then communicate to the Board of Graduate School stating the reason why he/she wants to defer/interrupt the study programme and permission duly granted before he/she leaves the University. Except for medical reasons, a student may not be allowed to interrupt or defer/break the study programme for more than two (2) continuous teaching Trimesters. A student who stays away for more than two (2) teaching trimesters is deemed to have withdrawn from the Centre's Programmes, hence, UDS and may need to re-apply for admission.

4.4 Grading System

Student performance in a course and dissertation/thesis shall be recorded in letter grades after due conversion from percentage score. Each course shall be graded out of 100 marks (including continuous assessment marks). For taught courses, final examination shall consist of 60% and continuous assessment 40% of the total marks. Examiners shall use the grading system presented in Table 1 to evaluate Dissertations/Theses.

Table 1: Grading System

| % Scores | Grade | Remarks |
|-----------------|----------------|----------------|
| 80 – 100 | A ⁺ | Excellent |
| 70 - 79 | A | Very good |
| 65 - 69 | B ⁺ | Good |
| 60 - 64 | B | Credit |
| Below 60 | F | Fail |

Note: The following letter grade may also be assigned

I – Incomplete

Z – For involvement in Examination malpractice

Minimum Pass Grade: A Student is required to obtain a minimum pass grade of B for each examination taken. Grading systems are subject to changes as determined by the Graduate Board and in view of current standards. The following information relates to the rules and procedures that apply to the admissions to research degrees by the Graduate School of UDS

5.0 THE DISSERTATION/THESIS

5.1 Dissertation/Thesis Proposal and Title

- i. By the end of the first year of study, all research students (MSc/MPhil/PhD) shall submit their research proposals to their respective Heads of Department for consideration by the Departmental Committee/WACWISA on Graduate programme(s)
- ii. At the beginning of the second year, the Head of Department/WACWISA shall submit to the Dean of Graduate School, the approved Theses titles, through the Faculty Graduate programme committee.
- iii. Any change of thesis title, must be communicated to the Board of the Graduate School.
- iv. All research students must acquaint themselves with the Research and Ethics Policy of the University.

5.2 Technical Requirement of the Dissertation/Thesis Report

The technical requirements of Dissertation/Thesis Report are according to the requirements and standards of Graduate School of UDS as follows:

- i. The Dissertation/Thesis shall be written in English and the presentation must be satisfactory. It must be suitable for publication.
- ii. The Dissertation/Thesis shall consist of the candidate's own account of his/her research. It may describe work done in conjunction with other person(s) provided that the candidate shall state clearly his/her contribution in the investigation certified by his/her supervisor(s).
- iii. Any already published work of the candidate may be included in the Dissertation/ Thesis, if such information is relevant to the subject matter of the thesis.
- iv. A candidate shall not be permitted to submit as his/her Dissertation/Thesis for which a degree has been conferred in this or any other university. But a candidate shall not be precluded from incorporating as a critique review only, that challenges the current work and adds new knowledge to the existing work which he/she has already submitted for a degree in this or in another university. Every candidate shall present a short abstract of his/her thesis comprising not more than 350 words giving a general account of its content, methodology and findings, which shall be bound with each copy of the thesis submitted to the Board of Graduate School.
- v. A project work submitted for MSc. degree or a thesis submitted for the MPhil/PhD degree must not exceed the number of words or pages, up to the List of References, prescribed by the Board of the Graduate School. Currently they are the following:

[Name of University]

[Name of Centre]

[Title of Thesis/Dissertation]

[Full Name of Candidate (without titles)]

[Dissertation/Thesis Submitted to the Department of Agronomy, Faculty of Agriculture, University for Development Studies in Partial Fulfilment of the Requirements for the Award of Master of Science Degree in Agronomy]

[Year]

For example, the outside cover of Ahmed Alhassan dissertation/thesis will look like this:

UNIVERSITY FOR DEVELOPMENT STUDIES

WEST AFRICAN CENTRE FOR WATER, IRRIGATION AND SUSTAINABLE AGRICULTURE

PERFORMANCE EVALUATION OF SPRINKLER IRRIGATION SYSTEMS UNDER IWAD AT
MAMPRUGU MUADURI DISTRICT

AHMED ALHASSAN

[DISSERTATION/THESIS SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL
ENGINEERING, SCHOOL OF ENGINEERING, UNIVERSITY FOR DEVELOPMENT STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF
SCIENCE DEGREE IN IRRIGATION AND DRAINAGE ENGINEERING]

MARCH 2019

Note that the 'BY and titles such as Mr., Mrs, Rev, etc. are NOT acceptable on the Outside Cover.

Inner Cover

The next page is the INSIDE COVER or the TITLE page. The page consists of SIX BLOCK OF WORDS. The first block is the UNIVERSITY FOR DEVELOPMENT STUDIES set off at the top and placed five single spaces from the top of the page and centred between the margins. This first block is followed by the name of the CENTRE; the third is the TITLE of the DISSERTATION/THESIS. The fourth block is the FULL NAME of the candidate, the last degree obtained and student identification number. The next block indicates the DEPARTMENT and the FACULTY of the UNIVERSITY to which the thesis/dissertation is submitted. The sixth block states the MONTH and the YEAR (on the horizontal line) that the report is submitted. The information specified in the bracket below must be provided in vertical order:

[Name of University]

[Name of Centre]

[Title of Thesis/Dissertation]

By

[Name of Candidate] [1st and/or 2nd degree]

[Student ID. No.]

[Dissertation/Thesis Submitted to the Department of Agricultural Engineering, School of Engineering,
University for Development Studies in Partial Fulfilment of the
Requirements for the Award of Master of Science Degree in Irrigation and Drainage Engineering]

[Month and Year]

For example, the inside cover of Ahmed Alhassan's dissertation will look like this:

| |
|--|
| <p style="text-align: center;">UNIVERSITY FOR DEVELOPMENT STUDIES</p> <p style="text-align: center;">WEST AFRICAN CENTRE FOR WATER, IRRIGATION AND SUSTAINABLE AGRICULTURE</p> <p style="text-align: center;">PERFORMANCE EVALUATION OF SPRINKLER IRRIGATION SYSTEMS UNDER IWAD AT MAMPRUGU MUADURI DISTRICT</p> <p style="text-align: center;">BY</p> <p style="text-align: center;">AHMED ALHASSAN (BSc. Agricultural Technology, MSc. Irrigation and Drainage Engineering) (UDS/MAG/006/08)</p> <p style="text-align: center;">[DISSERTATION/THESIS SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL ENGINEERING, SCHOOL OF ENGINEERING, UNIVERSITY FOR DEVELOPMENT STUDIES IN PARTIAL FULFILMENT OF TH REQUIREMENTS FOR THE AWARD OF MASTER OFSCIENCE DEGREE IN IRRIGATION AND DRAINAGE ENGINEERING]</p> <p style="text-align: center;">DECEMBER 2019</p> |
|--|

Note that the use of 'BY' should be used here. However, titles are still not acceptable.

Declaration Page

Student

I hereby declare that this dissertation/thesis is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere:

Candidate's Signature:..... Date:.....

Name (Print):

Supervisors'

I hereby declare that the preparation and presentation of the dissertation/thesis was supervised in accordance with the guidelines on supervision of dissertation/thesis laid down by the University for Development Studies.

Principal Supervisor's Signature:..... Date:.....

Name (Print):

Co-Supervisor's Signature (if any) Date:.....

Name (Print):

Head of Department Signature:..... Date:.....

Name (Print):

WACWISA Director Signature Date:.....

Name (Print):

Abstract

The abstract should contain a brief summary to tell the reader what the report is about and what the main conclusions are. It should not exceed three hundred and fifty (350) words. It should not be paragraphed. Note that an abstract should not, other than exceptional circumstances, contain symbols and many technical terms. It is numbered page two (in lower case Roman numerals) in the report.

Acknowledgement

This section provides the student with the opportunity to express his/her gratitude to those who directly assisted him/her to successfully complete his thesis/dissertation. These may be mentors, supervisors, organizations, officials, chiefs, colleagues, among others. The page must be placed immediately after the abstract page. It is highly unconventional to acknowledge God or Allah or any other supernatural powers in documents of this nature.

Dedication

This is not a requirement, although it may be allowed. It should be noted that the dedication page is not another acknowledgement page. It should contain at most two lines, consisting of just a few words. For example: To My Family or in memory of My Father.

Table of Contents

The Table of Contents (not just Contents) should be typed in BLOCK or UPPER CASE letters. All chapter headings should be in UPPER CASE letters and made bold: subheadings should appear in lower case. The corresponding pages of headings and subheadings of tables and figures should be indicated.

List of Tables/Figures

These should show the table or figure numbers, their captions (titles) and page numbers. Tables are supposed to be on the same page and not far away from the reference discussions.

Main Text

- In the text, the title should appear on top of the Table and should be made bold. The figure or plate (If they are maps or pictures) numbers should appear below the figure and equally be made bold.
- Paragraphing the first line of each paragraph should be one space. The text should be in justified format.
- The recommended standard bibliographic format for all theses and dissertations should be the APA (American Psychological Association) Style. However Faculties/departments may opt for other formats, provided that these are communicated to the Board of Graduate School.

5.4 Approval of the Thesis by the Supervisor(s)

- i. The thesis must demonstrate the candidate's competence in independent scientific research. It may be an academic thesis on a certain topic, or a collection of separate articles which may or may not have been published previously and which all relate to the topic of the thesis (especially for doctoral thesis) or as determined by the department.
- ii. The thesis must be approved by the supervisor(s), who ascertain(s) whether it is worthy to serve as evidence of the candidate's ability to do independent scientific work. If a candidate has more than one supervisor, they must all agree and notify the Graduate Board that they have approved the thesis through the signing of the declaration page of the dissertation/thesis.
- iii. In the event of disagreement between the supervisor and the candidate, both parties have the right to call on the Board of Graduate School to arbitrate. If this arbitration does not reconcile the parties within a month, the parties may approach the Academic Board, who will appoint a committee from among its members to consider the matter. This committee will bring out a judgment within two months, and the Academic Board will act on its advice.

5.5 Extension of Time for Submission of Dissertation/Thesis

- i. A candidate who is unable to submit his/her dissertation/thesis within the stipulated registration period for the programme may apply for one year extension through the candidate's supervisor(s). This application should be routed through the Head of Department and Graduate Programme Coordinators to the Dean of Graduate School and copied the Director of WACWISA. The Board of Graduate School may allow an extension of not more than one academic year. Such candidates will be required to pay the Academic Facility User fees for each year of extension granted.
- ii. A candidate, who fails to complete his /her programme after the extension period, shall be withdrawn from the programme. Such a candidate may however reapply for admission and pay full fees. If readmitted within two years after withdrawal, he/she will be credited with the courses already taken.

5.6 Submission of Thesis

Six bound copies shall be presented to the University using the following recommended colour code schemes as back covers in binding the Dissertations/ Theses:

| | | |
|-------------|--------|-------------------|
| MSc./MPhil. | Thesis | Brown colour |
| PhD | Thesis | Blue-Black colour |

Copies of Dissertations/theses that have been accepted for award of degree shall be distributed as follows:

- The original copy shall be deposited in the University Library,
- A copy shall be presented to the Department,
- A copy shall be presented to WACWISA
- A copy shall be given to Graduate School,

- A copy to the Supervisor, and
- A copy back to the candidate.

However, a student having more than one supervisor will be required to produce extra copies to their number.

- i. If the candidate fails the oral examination, he shall not be represented for a repeat examination until after six months of the first attempt.
- ii. A candidate shall only be qualified for the award of a Master's degree by research or Doctorate degree if he/she has passed all the prescribed courses, submitted a satisfactory thesis, passed his/her oral examination and has done the minimum number of semesters as stipulated for the programme.
- iii. The effective date of the award of the degree shall be the date of graduation (i.e. at the next congregation after the corrected thesis is certified by the Graduate School).

6.0 GRADUATE PROGRAMMES UNDER WACWISA

6.1 Accredited Programmes

The Department of Agricultural Engineering (DAE) of the School of Engineering, University for Development Studies awards the degree of:

- Master of Philosophy (MPhil) Irrigation and Drainage Engineering
- Doctor of Philosophy (PhD) Irrigation and Drainage Engineering

6.2 Programmes being Developed for Accreditation

The Department of Environment, Water and Waste Engineering (DEWWE) of the School of Engineering, University for Development Studies awards the degree of:

- Master of Philosophy (MPhil) Integrated Water Resources & Environmental Management
- Doctor of Philosophy (PhD) Integrated Water Resources & Environmental Management

The Department of Climate Change and Food Security of the Faculty of Agribusiness and Communication Sciences, University for Development Studies awards the degree of:

- Master of Philosophy (MPhil) Sustainable Agricultural and Food Systems
- Doctor of Philosophy (PhD) Sustainable Agricultural and Food Systems

6.3 Philosophy, Objectives and Outcomes of the Programmes

a) Philosophy of the Programmes

The curricula for MPhil. and PhD in Irrigation and Drainage Engineering programme have been designed with strong academic, research and practical background in engineering and specialized in irrigation and drainage engineering with the aim to produce graduates who can fit into industry to meet national and international needs upon graduation.

6.4 Programmes Objectives and Learning Outcomes

6.4.1 Programme Objectives

The objectives of the programmes include:

1. Capacity development of the manpower needed for the design, supervision, construction and management of irrigation and drainage systems in a sustainable manner in Ghana and the West Africa region.
2. Develop students' analytical, evaluative and advanced skills to be applied in problem solving as well as support policy formulation and development of growth and sustainability plans for the irrigation and drainage sector.
3. Build capacity of students for the conduct of cutting-edge and development-oriented research in irrigation and drainage areas in view of changing climates.

6.4.2 Programme Learning Outcomes

At the end of the training, graduates will be able to use the acquired knowledge, skills to:

- i) Design, supervision, construction and management of irrigation and drainage system.
- ii) Analyse, evaluate and applied in problem solving as well as support policy formulation and development of growth and sustainability plans for the sector.
- iii) Plan and conduct original and advanced research according to internationally recognized standards in the area irrigation and drainage.
- iv) Pursue careers in irrigation and drainage systems management.

7.0 Master of Philosophy (MPhil) Programmes

The Master of Philosophy (MPhil.) programme shall be 24 months (two academic years) of taught course work and a thesis. Students in this programme shall undertake compulsory core course modules in the first year (first and second trimesters and undertake an integrated group assignment in the third trimester). The first year shall be for a period of 12 months and the course work shall include classroom lectures/tutorials and field as well as laboratory practicals. A trimester usually covers a period of 16 weeks. Students shall present seminars during the period of study and submit a thesis which shall be researched within a period of 12 months during the study period. Amongst other requirements, for a Master of Philosophy programme, students are mandated to undertake a minimum of 41 credits of course work.

7.1 MPhil in Irrigation and Drainage Engineering (IDE)

7.1.1 Structure of Courses/Modules

Year One: Trimester One

| Course Code | Course Title | Units | | |
|--------------|--|-------|-----|-----------|
| | | L | T/P | Credits |
| IDE 501 | Advanced Water Resources Engineering | 2 | 3 | 3 |
| IDE 503 | Advanced Agricultural Drainage and Flood Control | 1 | 2 | 3 |
| IDE 505 | Advanced Soil Physics | 2 | 3 | 3 |
| IDE 507 | Agricultural Machinery and Land Development | 2 | 1 | 2 |
| IDE 509 | Pumps and Pumping Plants | 2 | 2 | 3 |
| IDE 511 | Irrigation Structures Construction and Civil Works | 2 | 2 | 3 |
| IDE 513 | Statistics and Research Methods | 2 | 1 | 2 |
| IDE 515 | Seminar I | 0 | 2 | 1 |
| Total | | | | 20 |

Year One: Trimester Two

| Course Code | Course Title | Units | | |
|--------------|---|-------|-----|-----------|
| | | L | T/P | Credits |
| IDE 502 | Irrigation Project Planning and Feasibility Studies | 2 | 1 | 2 |
| IDE 504 | Crop Water Requirements and Irrigation Scheduling | 2 | 1 | 2 |
| IDE 506 | Irrigation Facility Management, Monitoring and Evaluation | 2 | 1 | 2 |
| IDE 508 | GIS Modelling of Irrigation and Drainage Systems | 2 | 3 | 3 |
| IDE 512 | Agronomy of Irrigated Crops | 2 | 1 | 2 |
| IDE 514 | Design of Surface Irrigation Systems | 2 | 3 | 3 |
| IDE 516 | Design of Sprinkler and Drip Irrigation Systems | 2 | 3 | 3 |
| IDE 522 | Seminar II | 0 | 2 | 1 |
| Total | | | | 19 |

6.4.2 Programme Learning Outcomes

Year One: Trimester Three

| Course Code | Course Title | T | T/P | Credits |
|----------------------|---|---|----------|----------|
| IDE 599 | Integrated Assignment and Field Practical | - | 8 | 4 |
| Total Credits | | - | 8 | 4 |

Year Two: Student Research/Thesis

| Course Code | Course Title | Units | | |
|--------------|------------------------------|-------|-----|----------|
| | | L | T/P | Credits |
| IDE 699 | Student Research Work/Thesis | 0 | 18 | 6 |
| Total | | | | 6 |

7.1.2 Descriptions of Courses/Modules

Year One: Trimester One

IDE 501: Advanced Water Resources Engineering

At the end of the course, students shall develop skills which will allow them to be able to identify the importance of hydrologic cycle and water balance in water resources development, estimate runoff using CN number methods, rational method and analyse run off data for water systems design. Their knowledge level in the area of groundwater resources occurrence and development, design, construction and completion of water wells, as well as their ability to analyse borehole yields and yield related parameters will be enhanced.

IDE 503: Advanced Agricultural Drainage and Flood Control

The course is designed to prepare students to be able to identify the purpose and benefits of drainage, causes and effects of drainage problems on plants and soils as well as drainage requirements of crops. Students will also develop understanding of drainage system design and factors affecting drainage as well as be able to analyse hydraulics of drainage pipes, drain line performance, pipe drainage testing, mole drainage.

IDE 505: Advanced Soil Physics

Students following this course at the end will be able to develop skills and knowledge which will equip them to be able to identify the importance of hydrologic cycle and water balance in water resources development as well as be able to analyse equilibrium in force fields and theory of potentials. The objectives and principles of soil tillage, soil structure, moisture, temperature, aeration and the understanding of the composition and physical properties of soils. They should also be able to calculate flow of water in saturated soil.

IDE 507: Agricultural Machinery and Land Development

This course will build students capacity in the area of the identification of irrigated land development equipment and their functions, the objectives and principles of soil tillage, soil structure, moisture, temperature, aeration, destruction of weeds, changing tillage needs, straw incorporation and influence of mechanization. At the end, students will also develop understanding of the theories of soil strength and shear force, soil vulnerability and failure, Coulomb's and Micklethwaite and also will be able to perform force analysis of the tillage operations of implements and determine time-force characteristics.

IDE 509: Pumps and Pumping Plants

Pumps and pumping plants are very important in the irrigation industry and this course module will equip students with knowledge to be able to identify the types of irrigation pumps and their principles of operation as well as develop knowledge in the analysis of pump performance and computation, water flow measurement, testing and rating of pumps. An understanding of groundwater resources occurrence and development for pump installation, pump characteristics curves and their applications as well as be able to calculate total dynamic head or total pumping head needed for lifting water to agricultural production sites.

Year One: Trimester Two

IDE 511: Irrigation Structures Construction and Civil Works

The construction of sustainable water conservation and conveyance structures is very much important in irrigation development. The course will allow the identification of the types and use of construction materials, acquisition of knowledge on survey, design, construction works and principles of water conservation, water storage structures, conveyance and distribution structures. Students will also be able to use the CN number method, rational method for the estimation of runoff and as well analyse run off data for water systems design. Students will also develop deeper understanding and acquisition of knowledge on the typology of canal structures, hydraulic properties of canal structures, hydraulic calculations of the various canal structures, sectional drawings of the canal structures. Students shall at the end be able to design and supervise the construction and completion of water retention and conveyance structures.

IDE 513: Advanced Statistics and Research Methods

This course is design to equip students with knowledge and skills in the application of statistical methods to organise and analyse as well as interpret results in a wide application system. Students shall acquire knowledge on single and multiple factors experiments, understand the principles of design and analysis of experimental data as well as experimental designs. Students will also acquire knowledge in the area of the effect of estimation theory, testing of hypothesis, correlation and regression, randomized design, and multivariate analysis.

IDE 515: Seminar I

Students to present developed research proposals and field practical reports. This will build students capacity in the area of the development of skills in public speaking and presentations. It serves as a platform for the presentation of research accomplishments of scientists/students.

Year One: Trimester Two

IDE 502: Irrigation Project Planning and Feasibility Studies

The planning and conduct of feasibility studies is very necessary for the proper execution of irrigation projects. The course will therefore allow students to acquire knowledge on the organization and management of irrigation projects and as well as be able to conduct feasibility studies for irrigation projects. Course modules will allow students understand groundwater resources occurrence and development and the conduct of feasibility studies for the exploration of groundwater resources. It will also allow students to acquire knowledge and skills on project planning, financial analysis, scheme investment analysis and economic analysis. It will also allow students to study analytically irrigation systems layout drawings, designs and field operations.

IDE 504: Crop Water Requirements and Irrigation Scheduling

Understanding the water requirements and system functionality in terms of irrigation scheduling is very important for production use of irrigation water and also the achievement of optimum yield. The course modules will include the identification of factors affecting crop evapotranspiration, estimation of reference crop evapotranspiration using the FAO Penman-Monteith Equation and crop evapotranspiration or crop water requirements under standard conditions. Also, students will also develop skills and knowledge in the area of estimation of crop water and irrigation requirements using computer programmes e.g. FAO CROPWAT and AQUACROP Models. A deeper understanding of the use of tensiometers for irrigation scheduling, irrigation and scheduling based on crop water requirement calculations. They will also be able to analyse climatic data required for calculation of crop and irrigation water requirements.

IDE 506: Irrigation Facility Management, Monitoring and Evaluation

The development of irrigation projects is costly and involves huge investments so there is the need for training in the area of facility management as well as the monitoring and evaluation of their performance. The course modules will allow students to identify effects of drainage on the project area or environment, upstream and downstream. It will allow students to be able to analyse long-term salinity level and percolation, sodium hazard of irrigation water, reclamation of salt-affected soils.

Students will also be able to understand the management strategies of dam and dugout walls, spillways, canals, channels, night storage structures and as well be able to analyse problems associated with water delivery structures and losses associated with poor management of water delivery systems. The students will also be able to conduct monitoring and evaluation, use the logical framework, participatory monitoring and evaluation.

IDE 508: GIS Modelling of Irrigation and Drainage Systems

Students at the end of the course will be able to acquire knowledge on recent trends and applications of GIS on irrigation systems assessment. Modules will cover areas like fundamentals of hydraulic, hydrological and environmental processes, modelling and modelling tools and techniques, control techniques, decision support and information and communication technology. At the end of the course students should be able to collect field data using Global Position Systems (GPS), understand the integration of modelling tools and information systems. Also, the application of mathematical models and use of univariate and multivariate analyses to predict current and future water use and management systems will be explored. Students should also be able to process rainfall data and develop double mass curves, probable maximum precipitation, distribution graph, instantaneous unit graph, synthetic unit hydrograph and peak flow measurements using ArcGIS.

IDE 512: Agronomy of Irrigated Crops

At the end of the course, students shall acquire knowledge on good agronomic practices such as seed storage, seed treatment, germination and emergence, improved seedbed management, rotation, soil sterilization, seedbed preparation etc. They shall be able to identify fertilizers types and nutrient deficiency as well as characterise irrigated vegetables and fruits (seasonality, susceptibility to damage, perishability, diversity, harvesting, packing, grading and transportation). Students shall develop wider understanding of irrigation methods; soil-plant-water-atmosphere continuum; soil as water reservoir, soil physical properties and its water holding characteristics and also be able to analyse climatic data and use it to calculate crop and irrigation water requirements.

IDE 514: Design of Surface Irrigation Systems

Surface irrigation systems abound in most countries where irrigation is practised in Africa. It is therefore very important to train the needed manpower for the sector and in this course the modules will allow students to be able to design surface irrigation systems and its components which can function in the field. Knowledge on different water application methods under surface irrigation systems and criteria for the selection of the surface irrigation method. Students after the course should be able to characterise water delivery devices and water flow control devices used in surface irrigation systems and also develop skills and knowledge in the calculation of different types of efficiencies of surface irrigation systems. They should also be ready to conduct monitoring and performance evaluation of different surface irrigation systems designs.

IDE 516: Design of Sprinkler and Drip Irrigation Systems

Emerging irrigation technologies with the main aim of improving irrigation efficiency include sprinkler and drip irrigation systems. The course is therefore designed to allow students develop knowledge and skills which will allow them to be able to design sprinkler and drip irrigation systems and their components which can function in the field as well as monitor and evaluate the performance of different sprinkler and drip irrigation systems designs. Students should also be able to acquire knowledge on different water application methods under sprinkler and drip irrigation systems and criteria for the selection of systems. Knowledge and skills in the area will be developed to characterise water delivery devices and water flow control devices and also allow the calculation of different types of efficiencies of sprinkler and drip systems. Students should be able to analyse performance of different water lifting devices, pressure pipe systems as well as identify chemical injection equipment and their level of performance. Also, students will be able to characterise water delivery devices and water flow control devices following an understanding of how pressure and water flow control devices are used for pressurised irrigation systems designs.

IDE 522: Seminar II

Students undertake and present seminars on joint assignments to inculcate group work dynamics and as well sharpen their seminar and public presentation skills.

IDE 599: Integrated Field Assignment

Students will undertake a compulsory 10 weeks internship in an industrial setting. They will be supervised by both academic staff and industry partners and will be assigned a topical problem in the area of irrigation and drainage engineering. They will present a comprehensive report and also a seminar for assessment.

IDE 699: Student Research Project

Students to undertake independent, practical and problem-solving research work in the area of irrigation and drainage engineering leading to a dissertation/thesis.

The research project should have very clear objectives, the problem that requires the research solution, up-to-date literature relevant to the study, study hypotheses, appropriate and logical materials and methods relevant for data collection, processing, analysis and presentation. Presentation of the results based on the objectives and their discussions as well as drawing of significant conclusions and implications of the study findings.

7.2 MPhil in Integrated Water Resources and Environmental Management (IWREM)

7.2.1 Structure of Courses/Modules

Year One: Trimester One

| Course Code | Course Title | Units | | |
|--------------|--|-------|-----|-----------|
| | | L | T/P | Credits |
| IWRE 501 | Advanced Water Resources Management and Engineering | 2 | 3 | 3 |
| IWRE 503 | Ground and Surface Water Hydrology | 2 | 3 | 3 |
| IWRE 505 | Hydrogeology, Water Flow and Hydraulics | 2 | 3 | 3 |
| IWRE 507 | Water Resources Planning, Systems Analysis & Data Management | 2 | 3 | 3 |
| IWRE 509 | Watershed Conservation and Management | 2 | 3 | 3 |
| IWRE 511 | Water and Environmental Laws and Policies | 2 | 3 | 3 |
| IWRE 513 | Project Planning and Feasibility Studies | 2 | 1 | 2 |
| IWRE 515 | Water Quality and Environmental Processes & Laboratory | 2 | 1 | 2 |
| IWRE 517 | Seminar I | 0 | 2 | 1 |
| Total | | | | 23 |

Year One: Trimester Two

| Course Code | Course Title | Units | | |
|---|---|-------|-----|-----------|
| | | L | T/P | Credits |
| IWRE 502 | Geo-Informatics, GIS and Remote Sensing | 2 | 3 | 3 |
| IWRE 504 | Computational Intelligence for Hydrosystems | 2 | 3 | 3 |
| IWRE 506 | Environmental Water Quality Processes Management | 2 | 3 | 3 |
| IWRE 508 | Advanced Statistics and Research Methods | 2 | 3 | 3 |
| IWRE 510 | Gender, Climate Change and Water Resources Management | 2 | 3 | 3 |
| IWRE 512 | Water and Ecosystems | 2 | 1 | 2 |
| IWRE 514 | Geo-informatics, GIS and Remote Sensing Laboratory | 2 | 1 | 2 |
| IRWE 516 | Seminar II | 0 | 2 | 1 |
| Electives (Students to Choose One) | | | | |
| IWRE 518 | Flood Modelling and Drought Assessment | 2 | 3 | 3 |
| IWRE 520 | River Engineering and Management | 2 | 3 | 3 |
| IWRE 522 | Environmental Impact Assessments of Water Resources Development | 2 | 3 | 3 |
| Total | | | | 23 |

Year One: Trimester Three

| Course Code | Course Title | T | T/P | Credit |
|----------------------|---|---|----------|----------|
| IWRE 599 | Integrated Assignment and Field Practical | - | 4 | 4 |
| Total Credits | | - | 4 | 4 |

Year Two: Trimester One

| Course Code | Course Title | Units | | |
|--------------|-----------------------|-------|-----|----------|
| | | L | T/P | Credit |
| IWRE 699 | Student Research Work | 0 | 6 | 6 |
| Total | | | | 6 |

Year Two: Trimester Two

| Course Code | Course Title | Units | | |
|--------------|-----------------------|-------|-----|----------|
| | | L | T/P | Credit |
| IWRE 699 | Student Research Work | 0 | 6 | 6 |
| Total | | | | 6 |

7.2.2 Descriptions of Courses/Modules

Year One: First Trimester

IWRE 501: Advanced Water Resources Management and Engineering

During the course, students shall learn about the importance of hydrologic cycle and water balance in water resources development, understand groundwater resources occurrence and development and be able to understand the design, construction and completion of water wells. Students build their knowledge and will be able to estimate runoff using CN number methods, rational method and analyse run off data for water systems design and also be able to analyse borehole yields and yield related parameters.

IWRE 503: Ground and Surface Water Hydrology

At the end of the course, students shall be able to understand the hydrological cycle and the occurrence of surface water resources, analyze runoff occurrence and hydrographs of rivers and understand groundwater occurrence and the behaviour of aquifers.

IWRE 505: Hydrogeology, Water Flow and Hydraulics

This course allows students to develop knowledge and skills in understanding the basics of groundwater flow and sub-surface flow to drains, testing of aquifers and the method of analysing aquifer performance as well as develop understanding in the area of groundwater contamination, sampling of water for hydrochemical analysis and analytical procedures for assessment of contamination.

IWRE 507: Water Resources Planning, Systems Analysis and Data Management

This course develops the understanding of participating students on the concepts in water resource planning, programming of water resource utilization using basic and advanced optimization techniques and also carrying out systems analysis of water resources and data management.

IWRE 509: Watershed Conservation and Management

Watershed conservation and management is very important in the building of student capacity to be able to manage and protect the watershed from degradation. Students following this course module shall develop understanding as well as build their knowledge and skills for an integrated approach to watershed management, soil conservation as well as water harvesting and conservation. They shall also be able to use GIS as a decision support system for watershed management.

IWRE 511: Water and Environmental Laws, Policies and Institutions

Students on this course should be able to understand the difference between policy, law, bill, act, rules, notifications, etc and other concepts governing the water and environmental institutional sector. They shall also learn about the water governance system as well as the policies and legal frameworks of the sector and transboundary water issues as well as international law, treaties and protocols governing the sector.

IWRE 513: Project Planning and Feasibility Studies

The planning and conduct of feasibility studies is very necessary for the proper execution of water resources and environmental management projects. The course will therefore allow students to acquire knowledge on the organization and management of projects and as well as be able to conduct feasibility studies for projects. Course modules will allow students understand groundwater resources occurrence and development and the conduct of feasibility studies for the exploration of groundwater resources. It will also allow students to acquire knowledge and skills on project planning, financial analysis, scheme investment analysis and economic analysis.

IWRE 515: Water Quality and Environmental Processes & Laboratory

The ability to conduct quality and accurate laboratory analysis has a great impact on the results that are obtained. Students will therefore develop knowledge and skills which will allow them to undertake field and laboratory works in the analysis of several water quality parameters as well as the analytical procedures involved in the preparation and analysis of water samples.

IWRE 517: Seminar I

Students to present developed research proposals and field practical reports. This will build and sharpen students capacity in the area of the development of skills in public speaking and presentations. It serves as a platform for the presentation of research accomplishments of scientists/students.

Year One: Second Trimester

IWRE 502: Geo-Informatics, GIS and Remote Sensing

At the end of the course, students shall acquire knowledge on recent trends and applications of GIS in water resources and environmental systems assessment, fundamentals of hydraulic, hydrological and environmental processes, modelling and modelling tools and techniques, control techniques, decision support and information and communication technology. Students after the programme should be able to collect field data using Global Position Systems (GPS) and as well understand integration of modelling tools and information systems.

IWRE 504: Computational Intelligence for Hydrosystems

The use of digital information and tools as well as computer intelligence will introduce students to knowledge systems and use of advanced computing knowledge in water resources and environment management. They will also be able to use digital data management systems in water resources and environmental management, artificial intelligence systems in the modelling of water resources and the use of simulation models and software in water resources management.

IWRE 506: Environmental Water Quality Processes Management

Water quality is very important in promoting decision making in the area of process management. Students after this course will develop understanding for water quality based on its physical, chemical and biological properties and also the process of water recycling and reuse as well as water quality management.

IWRE 508: Advanced Statistics and Research Methods

This course is design to equip students with knowledge and skills in the application of statistical methods to organise and analyse as well as interpret results in a wide application system. Students shall acquire knowledge on single and multiple factors experiments, understand the principles of design and analysis of experimental data as well as experimental designs. Students will also acquire knowledge in the area of the effect of estimation theory, testing of hypothesis, correlation and regression, randomized design, and multivariate analysis.

IWRE 510: Gender, Climate Change and Water Resources Management

By the end of the course students following this course module shall develop understanding which seeks to improve gender relations and roles and how they affect and are affected by water management issues. It will also allow students to improve the understanding and awareness of gender concepts, appreciate the negative consequences of the perpetration of patriarchal societies and the importance of promoting gender equality and mainstreaming. Also, a deeper understanding of the importance of the complementary roles of all genders in promoting sustainable agricultural and food systems at local and global levels will be looked at. The course will also discuss the importance and appreciation of the degree to which positive local ethical and cultural behaviours are being substituted for negative foreign ones to the detriment of sustainable development, while local negative attitudes and behaviours are maintained.

IWRE 512: Geo-Informatics, GIS and Remote Sensing Laboratory

Students offering this course shall be exposed to the planning process and undertaking field and laboratory experiments based on skills development of students in the area of Ge-Informatics, GIS and Remote Sensing. The use of various GIS systems in assessment of flow direction, accumulation and watershed delineation will also be explored. Students should also be able to acquire, process and explore geospatial data for the purpose of map digitization and production of images.

IWRE 514: Water and Ecosystems

At the end of the course, students will be introduced to the principles of natural ecosystems, the social dimensions and approaches to water, the benefits to the society and the need for conservation of aquatic ecosystems.

IWRE 516 Seminar II

Students undertake and present seminars on joint assignments to inculcate group work dynamics and as well sharpen their seminar and public presentation skills.

Electives Course Modules

IWRE 518: Flood Modelling and Drought Assessment

At the end of the course, student's capacity shall be built to be able to estimate floods as well as develop management strategies for flood waters and as well undertake drought occurrence analysis, drought assessment, impacts as well as monitoring and management of floods.

IWRE 520: River Engineering and Management

This course will contribute to the knowledge of students through course modules which will allow the develop understanding of the functions of river systems, river hydraulics and mechanics. This will allow them to be able to undertake river system surveys and modelling leading to improved river management through river training works and regulation.

IWRE 522: Environmental Impact Assessment of Water Resources Development

The course shall expose students to the need, methodology, documentation and usefulness of environmental impact assessment in water resources development. They would also develop skills in undertaking Environmental Impact Assessments of Water Resources Projects and have appreciation of the importance of the environment and water resources development as well as the future challenges facing water resources management.

Year One: Trimester Three

IWRE 599: Integrated Assignment and Field Practical

Students will undertake a compulsory 10 weeks internship in an industrial setting. They will be supervised by both academic staff and industry partners and will be assigned a topical problem in the area of integrated water resources and environmental management. They will present a comprehensive report and also a seminar for assessment.

Year Two: Trimester One

IWRE 699: Student Research Project

Students to undertake independent, practical and problem-solving research work in the area of integrated water resources and environmental management leading to a thesis. The research project should have very clear objectives, the problem that requires the research solution, up-to-date literature relevant to the study, study hypotheses, appropriate and logical materials and methods relevant for data collection, processing, analysis and presentation. Presentation of the results based on the objectives and their discussions as well as drawing of significant conclusions and implications of the study findings. Students must present developed research proposals and field practical progress reports.

7.3 MPhil in Sustainable Agricultural and Food Systems (SAFS)

7.3.1 Structure of Courses/Modules

Year One: First Trimester

| Course Code | Course Title | Units | | |
|--|--|-------|-----|-----------|
| | | L | T/P | Credits |
| Core Courses | | | | |
| SAF 501 | Principles of Sustainable Agriculture and Food Systems | 2 | 3 | 3 |
| SAF 503 | Agricultural and Food Production Systems and Practices | 2 | 3 | 3 |
| SAF 505 | Agricultural Land, Soil and Water Resources Management | 2 | 3 | 3 |
| SAF 507 | Food Systems for Improved Food and Nutrition Security | 2 | 1 | 2 |
| SAF 509 | Operations Research Methods | 2 | 1 | 2 |
| SAF 511 | Seminar Presentation and Skills Development I | 2 | 1 | 2 |
| Elective Courses (choose any 2) | | | | |
| SAF 513 | Advanced Econometric Methods | 2 | 3 | 3 |
| SAF 515 | Climate Change and Agricultural and Food Systems | 2 | 3 | 3 |
| SAF 517 | Natural Resources Economics and Ecosystems Services | 2 | 3 | 3 |
| Total | | | | 21 |

Year One: Second Trimester

| Course Code | Course Title | Units | | |
|--|--|-------|-----|-----------|
| | | L | T/P | Credits |
| Core Courses | | | | |
| SAF 502 | Gender, Ethical and Cultural Dimensions in Agricultural and Food Systems | 2 | 3 | 3 |
| SAF 504 | Sustainable Agricultural Intensification | 2 | 3 | 3 |
| SAF 506 | Research and Analytical Methods | 2 | 3 | 3 |
| SAF 508 | The Politics of Agricultural and Food Systems Policies | 2 | 3 | 3 |
| SAF 510 | Seminar Presentation and Skills Development II | 2 | 1 | 2 |
| Elective Courses (choose any 2) | | | | |
| SAF 512 | Man, the Environment and Agrobiodiversity | 2 | 1 | 2 |
| SAF 514 | Food Losses and Waste | 2 | 1 | 2 |
| SAF 516 | Food Safety, Processing and Preservation | 2 | 1 | 2 |
| SAF 518 | Global and Domestic Food Systems Nexus | 2 | 1 | 2 |
| Total | | | | 18 |

Year One: Third Trimester

| Course Code | Course Title | Units | | |
|---------------|---|-------|---|---------|
| | | T | P | Credits |
| SAF 599 | Integrated Assignment and Field Practical | - | 4 | 4 |
| Total Credits | | - | 4 | 4 |

Year Two: Trimester One

| Course Code | Course Title | Units | | |
|--------------|-----------------------|-------|-----|----------|
| | | L | T/P | Credits |
| SAF 699 | Student Research Work | 0 | 6 | 6 |
| Total | | | | 6 |

Year One: First Trimester

| Course Code | Course Title | Units | | |
|--------------|-----------------------|-------|-----|----------|
| | | L | T/P | Credits |
| SAF 699 | Student Research Work | 0 | 6 | 6 |
| Total | | | | 6 |

7.3.2 Descriptions of Courses/Modules

Year One: First Trimester

SAF 501: Principles of Sustainable Agriculture and Food Systems

This course will give students a clear understanding of the differences between sustainable agriculture, sustainable agricultural systems and sustainable food systems. Students will be able to understand and appreciate agricultural, food, nutrition, climate and environmental issues from systems perspective. The course also gives an understanding of the interdisciplinary nature of sustainable agricultural and food systems such as the complex interactions between social and natural systems, scientific and non-scientific knowledge and the roles of politics and religion in system outcomes.

SAF 503: Agricultural and Food Production Systems and Practices

Students in this course will at the end be able to know the different types of agricultural and food production systems world-wide, in Africa and in Ghana. They should be able to analyze crop, livestock, forestry, fisheries and other production systems and practices in different agro-ecologies in Africa with emphasis on the West Africa sub-region and also be able to analyze the prospects for sustainability of the various systems through case studies.

SAF 505: Agricultural Land, Soil and Water Management

By the end of the course students shall have an opportunity to study and understand fundamental theories, concepts and tools relevant to the management of land, soil and water resources especially in relation to agriculture. It will also allow the development of an understanding and appreciation of the different sustainable land and soil management systems. Students will be able to study the different water management practices especially in Africa and prospects for sustainable water management in different parts of the continent and as well study different crop management practices especially in Africa and prospects for sustainable crop and farm management systems in the continent.

SAF 507: Food Systems for Improved Food and Nutrition Security

The course introduces students to an understanding and appreciation of the importance of food and nutrition security for all persons, the cost of malnutrition to nations and the social and environmental costs of prevailing food systems. It will increase the knowledge levels of students on the importance of local food systems and food sovereignty. Also, the course will contribute to sustainable food systems analysis (along value chains) and to appreciate the importance of sustainable food systems in providing high-quality, safe and sustainable diets for all persons.

SAF 509: Operations Research Methods (2 credits)

The course aims to deepen the importance of Operations Research (OR) methods in the analysis of agricultural and food systems. It will also lead to improved decision-making analyses using various OR methods. They will also gain knowledge which will make them well versed in computer simulations of agricultural and food systems.

SAF 511: Seminar I

Students to present developed research proposals and field practical reports. This course will build and sharpen students capacity in the area of the development of skills in public speaking and presentations. It serves as a platform for the presentation of research accomplishments of scientists/students.

SAF 513: Advanced Econometric Methods

Students in this programme option shall be able to build their skills thus making them have a good grasp of the rich analytical power of econometrics, be able to undertake data analysis using various econometric methods and able to interpret results from econometric analyses.

SAF 515: Climate Change and Variability Impact on Agricultural and Food Systems

The course module allows students to have a good understanding of the broad science of climate change and variability, climate change impacts on agricultural and food systems. They should also have explored the prevailing agricultural and food systems impacts on climate change and variability and on the environment. The identification and examination of the various adaptation and mitigation measures to climate change shall also be discussed.

SAF 517: Natural Resource Economics and Ecosystems Services

Students participating in this course module will be able to develop understanding of the effects of the demand for and supply of natural resources on the sustainability of agricultural and food systems. They will at the end be able to analyse the links of ecosystem services to sustainable agriculture and human well-being. An appreciation of the negative effect of the application of neoclassical economic theory on the environment and human welfare as well as obtaining adequate knowledge of international attempts at reducing the effects of human actions on the environment.

Year One: Second Trimester**SAF 502: Gender, Ethical and Cultural Dimensions in Agricultural and Food Systems**

An appreciation of the negative consequences of the perpetration of patriarchal societies and the importance of promoting gender equality and mainstreaming. Students will also develop understanding of the importance of the complementary roles of all genders in promoting sustainable agricultural and food systems at local and global levels. The degree to which positive local ethical and cultural behaviours are being substituted for negative foreign ones to the detriment of sustainable development, while local negative attitudes and behaviours are maintained will also be discussed.

SAF 504: Sustainable Agricultural Intensification

The course module entails environment-population-agricultural productivity nexus leading to an understanding of the “sustainability” versus “intensification” controversy. Students would be able to obtain good comparative knowledge of natural, prevailing and sustainable ecosystems as well as understand different pathways to achieving Sustainable Agricultural Intensification (SAI) in different parts of the continent.

SAF 506: Research and Analytical Methods

This course is meant to equip students with the requisite tools to undertake robust scientific research not only for their theses but also for multidisciplinary and interdisciplinary research after graduation. It includes introducing students to the purpose, importance, foundations and types of research as well as have an appreciation of the usefulness of different experimental designs in research. Students will be able to apply varied qualitative and quantitative methodologies to understand attitudes and behaviours related to agriculture and food. Students will also be able to develop capacity to be able to undertake well-structured scientific research with minimum supervision.

SAF 508: The Politics of Agricultural and Food Systems Policies

An understanding of national and international political decisions by students is said to have profound complex implications for agriculture and food and nutrition security in African countries. It will also build students knowledge in the area of strong and concerted political and good governance commitment to agricultural development, sustainable agricultural and food systems at local, national and global levels will be a mirage.

SAF 510: Seminar II

Students undertake and present seminars on joint assignments to inculcate group work dynamics and as well sharpen their seminar and public presentation skills.

SAF 512: Man, the Environment and Agrobiodiversity

The course allows students to gain knowledge and understanding of the interactions between man, the earth and earth resources that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries. They should also be able to appreciate the impacts of population on natural resources and the environment and as well have knowledge of the impacts of agriculture on agroecosystems and the importance of agrobiodiversity in sustainable agriculture.

SAF 514: Food Losses and Waste

Aside low productivity, food losses and waste are very important and therefore the appreciation of the magnitude of food losses and wastes along various commodity value chains and the implications for food and nutrition security is very necessary for students following this course module. They should also develop understanding for the social, economic and environmental costs of food losses and wastes and the reduction methods of these wastes and losses.

SAF 516: Food Safety, Processing and Preservation

Students on this course will appreciate the risks to human health and development in the consumption of unwholesome and contaminated foods. They will also be exposed to the importance of food processing and preservation for food and nutrition security and as well know the food safety, food processing and food preservation challenges and possible solutions in Africa.

SAF 518: Global and Domestic Food Systems Nexus

The impact of globalization on domestic and global food systems and the implications for sustainable food systems is very important for the food industry. It is therefore important for students to acquire knowledge and develop skills in this regard as well as the importance of working towards high-quality food environments.

7.4 Doctor of Philosophy: Irrigation and Drainage Engineering

7.4.1 Structure of the Programme

| Year | Activities of the Programme for the Years | | Credit hours |
|---------------------------|--|--|--------------|
| 1 | 1 st Trimester | Students to register and follow MPhil courses with examination | |
| | | Seminar I (IDE 701) Research Proposal Presentation | 3 |
| | 2 nd Trimester | Students to register and follow MPhil courses with examination. | |
| | | Seminar II (IDE 702): Finalised Research Proposal Presentation/Proposal progress report (At least 2 seminars in the trimester). | 3 |
| 3 rd Trimester | IDE 599: Integrated Assignment and Field Practical | 4 | |
| 2 | 1 st Trimester | Seminar III (IDE 721): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester) | 3 |
| | 2 nd Trimester | Seminar IV (IDE 722): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester) | 3 |
| | 3 rd Trimester | IDE 699: Integrated Assignment and Field Practical | 4 |
| 3 | 1 st Trimester | Seminar V (IDE 731): Presentation of preliminary research findings and drafting of thesis and research papers (At least 3 seminars in the trimester). | 3 |
| | 2 nd Trimester | Seminar VI (IDE 732): Presentation of progress report on writing up of thesis and initiate the process of publication of journal papers (At least 3 seminars in the trimester) | 3 |
| | 3 rd Trimester | Student Research Thesis (IDE 799): Final presentation of thesis (oral examination and public defence of thesis (Viva voce). | 6 |

7.4.2 Description of the programme

Year One: Trimester One

Students may take courses by auditing upon the recommendation of the supervisory team.

IDE 701: Seminar I

The PhD involves a three-year period of research in the students' home country or any location of his choice. Students are required to present a seminar on their PhD research proposal. This will cover the background for the research, the problem to be investigated, the objectives and the methodologies to be used including data analysis, a plan of the work to be carried out and the expected outputs or results. Students will be expected to give a seminar to be followed by a general discussion. It is expected that all members of the supervisory committees will be present at the proposal seminars.

Year One: Trimester Two

Students may take courses by auditing upon the recommendation of the supervisory team.

IDE 702: Seminar II

Students are required to present at least 2 seminars in the trimester on the finalized research proposals to a panel for assessment. They will present a public seminar in the Department consisting of Professors, Senior Lecturers, Lecturers, Students, etc.

Year One: Trimester Three

IDE 599: Integrated Assignment and Field Practical

Students will undertake a compulsory 10 weeks internship in an industrial setting. They will be supervised by both academic staff and industry partners. They will present a comprehensive report and also a seminar for **assessment**.

Year Two: Trimester One

IDE 721: Seminar III

At least three (3) seminars will be organised in the trimester. Presentations shall focus on the progress on student research/field work.

Year Two: Trimester Two

IDE 722: Seminar IV

Students present on monthly basis progress of research work and scientific papers development. At least three (3) seminars are recommended for the trimester.

Year Two: Trimester Three

IDE 699: Integrated Assignment and Field Practical

Students will undertake a compulsory 10 weeks internship in an industrial setting. They will be supervised by both academic staff and industry partners. They will present a comprehensive report and also a seminar for assessment.

Year Three: Trimester One

IDE 731: Seminar V

This involves presentation of preliminary research findings and drafting of thesis and research papers. In this trimester, students shall present at least 3 seminars. Students shall also begin the drafting of scientific papers.

Year Three: Trimester Two

IDE 732: Seminar VI

Students present at least 3 seminars on the progress relating to their thesis research work. Students also initiate the process to submit manuscripts for review and publication in refereed journals.

Year Three: Trimester Three

IDE 799: Student Research Thesis

Student submit independent, practical oriented and problem-solving research work in a bound copy for assessment. This shall include evidence of at least two (2) scientific manuscripts submitted for review and publication in refereed journals.

Final oral presentation and assessment of thesis - oral examination and public defence of thesis (Viva voce).

7.5 Doctor of Philosophy: Integrated Water Resources and Environmental Management

7.5.1 Structure of the Programme

| Year | Activities of the Programme for the Years | | Credit hours |
|--|---|---|--------------|
| 1 | 1 st Trimester | Students to register and follow MPhil courses with examination | |
| | | Seminar I (IWRE 701) Research Proposal Presentation | 3 |
| | 2 nd Trimester | Students to register and follow MPhil courses with examination. | |
| Seminar II (IWRE 702): Finalised Research Proposal Presentation/Proposal progress report (At least 2 seminars in the trimester). | | 3 | |
| | 3 rd Trimester | IWRE 599: Integrated Assignment and Field Practical | 4 |
| 2 | 1 st Trimester | Seminar III (IWRE 721): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester) | 3 |
| | 2 nd Trimester | Seminar IV (IWRE 722): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester) | 3 |
| | 3 rd Trimester | IWRE 699: Integrated Assignment and Field Practical | 4 |
| 3 | 1 st Trimester | Seminar V (IWRE 731): Presentation of preliminary research findings and drafting of thesis and research papers (At least 3 seminars in the trimester). | 3 |
| | 2 nd Trimester | Seminar VI (IWRE 732): Presentation of progress report on writing up of thesis and initiate the process of publication of journal papers (At least 3 seminars in the trimester) | 3 |
| | 3 rd Trimester | Student Research Thesis (IWRE 799): Final presentation of thesis (oral examination and public defence of thesis (Viva voce). | 6 |

7.5.2 Description of the programme

Year One: Trimester One

Students will take the relevant MPhil courses alongside the following:

IWRE 701: Seminar I

The PhD involves a three-year period of research in the students' home country or any location of his choice. Students are required to present a seminar on their PhD research proposal. This will cover the background for the research, the problem to be investigated, the objectives and the methodologies to be used including data analysis, a plan of the work to be carried out and the expected outputs or results. Students will be expected to give a seminar to be followed by a general discussion. It is expected that all members of the supervisory committees will be present at the proposal seminars.

Year One: Trimester Two

Students may take courses by auditing upon the recommendation of the supervisory team.

IWRE 702: Seminar II

Students are required to present at least 2 seminars in the trimester on the finalized research proposals to a panel for assessment. They will present a public seminar in the Department consisting of Professors, Senior Lecturers, Lecturers, Students, etc.

Year One: Trimester Three

IWRE 599: Integrated Assignment and Field Practical

Students will undertake a compulsory 10 weeks internship in an industrial setting. They will be supervised by both academic staff and industry partners. They will present a comprehensive report and also a seminar for assessment.

Year Two: Trimester One

IWRE 721: Seminar III

At least three (3) seminars will be organised in the trimester. Presentations shall focus on the progress on student research/field work.

Year Two: Trimester Two

IWRE 722: Seminar IV

Students present on monthly basis progress of research work and scientific papers development. At least three (3) seminars are recommended for the trimester.

Year Two: Trimester Three

IWRE 699: Integrated Assignment and Field Practical

Students will undertake a compulsory 10 weeks internship in an industrial setting. Academic staff and industry partners will supervise the students. The students will submit a comprehensive report and also make a seminar presentation for assessment.

Year Three: Trimester One

IWRE 731: Seminar V

This involves presentation of preliminary research findings and drafting of thesis and research papers. In this trimester, students shall make at least 3 seminar presentations. Students shall also begin the drafting of scientific papers.

Year Three: Trimester Two

IWRE 732: Seminar VI

Students present at least 3 seminars on the progress relating to their thesis research work. Students also initiate the process to submit manuscripts for review and publication in refereed journals.

Year Three: Trimester Three

IWRE 799: Student Thesis

Students submit independent, practical oriented and problem-solving research work in a bound copy for assessment. This shall include evidence of at least two (2) scientific manuscripts submitted for review and publication in refereed journals. This condition must be met before final oral presentation and assessment of thesis - oral examination and public defence of thesis (Viva voce).

7.6 Doctor of Philosophy: Sustainable Agricultural and Food Systems (SAFS)

7.6.1 Structure of the Programme

| Year | Activities of the Programme for the Years | | Credit hours |
|------|---|--|---------------------------------------|
| 1 | 1 st Trimester | Students to register and follow MPhil courses with examination Seminar I (SAF 701) Research Proposal Presentation | 3 |
| | 2 nd Trimester | Students to register and follow MPhil courses with examination. Seminar II (SAF 702): Finalised Research Proposal Presentation/Proposal progress report (At least 2 seminars in the trimester). | 3 |
| | | 3 rd Trimester | IWRE 599: Integrated Field Assignment |
| 2 | 1 st Trimester | Seminar III (SAF 721): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester) | 3 |
| | 2 nd Trimester | Seminar IV (SAF 722): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester) | 3 |
| | 3 rd Trimester | SAF 699: Integrated Field Assignment | 4 |
| 3 | 1 st Trimester | Seminar V (SAF 731): Presentation of preliminary research findings and drafting of thesis and research papers (At least 3 seminars in the trimester). | 3 |
| | 2 nd Trimester | Seminar VI (SAF 732): Presentation of progress report on writing up of thesis and initiate the process of publication of journal papers (At least 3 seminars in the trimester) | 3 |
| | 3 rd Trimester | Student Research Thesis (SAF 799): Final presentation of thesis (oral examination and public defence of thesis (Viva voce). | 6 |

7.6.2 Description of the Programme

Year One: Trimester One

Students will take the relevant MPhil courses alongside the following:

SAF 701: Seminar I

The PhD involves a three-year period of research in the students' home country or any location of his choice. Students are required to present a seminar on their PhD research proposal. This will cover the background for the research, the problem to be investigated, the objectives and the methodologies to be used including data analysis, a plan of the work to be carried out and the expected outputs or results. Students will be expected to give a seminar to be followed by a general discussion. It is expected that all members of the supervisory committees will be present at the proposal seminars.

Year One: Trimester Two

Students may take courses by auditing upon the recommendation of the supervisory team.

SAF 702: Seminar II

Students are required to present at least 2 seminars in the trimester on the finalized research proposals to a panel for assessment. They will present a public seminar in the Department consisting of Professors, Senior Lecturers, Lecturers, Students, etc.

Year One: Trimester Three

SAF 599: Integrated Assignment and Field Practical

Students will undertake a compulsory 10 weeks internship in an industrial setting. Academic staff and industry partners will supervise the students. The students will submit a comprehensive report and also make a seminar presentation for assessment.

Year Two: Trimester One

SAF 721: Seminar III

At least three (3) seminars will be organised in the trimester. Presentations shall focus on the progress on student research/field work.

Year Two: Trimester Two

SAF 722: Seminar IV

Students present on monthly basis progress of research work and scientific papers development. At least three (3) seminars are recommended for the trimester.

Year Two: Trimester Three

SAF 699: Integrated Assignment and Field Practical

Students will undertake a compulsory 10 weeks internship in an industrial setting. Academic staff and industry partners will supervise the students. The students will submit a comprehensive report and also make a seminar presentation for assessment.

Year Three: Trimester One

SAF 731: Seminar V

This involves presentation of preliminary research findings and drafting of thesis and research papers. In this trimester, students shall present at least 3 seminars. Students shall also begin the drafting of scientific papers.

Year Three: Trimester Two

SAF 732: Seminar VI

Students present at least 3 seminars on the progress relating to their thesis research work. Students also initiate the process to submit manuscripts for review and publication in refereed journals.

Year Three: Trimester Three

SAF 799: Student Research Thesis

Students submit independent, practical oriented and problem-solving research work in a bound copy for assessment. This shall include evidence of at least two (2) scientific manuscripts submitted for review and publication in refereed journals. This condition must be met before final oral presentation and assessment of thesis - oral examination and public defence of thesis (Viva voce).

8.0 WACWISA SCHOLARSHIP POLICY

8.1 Introduction to the Policy

This policy on Scholarships of the **West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA)** of the **University for Development Studies (UDS)**, Ghana is designed to guide the administration of scholarships offered to deserving students by the Center. Scholarships are awarded for Internships, Short Courses, Masters and PhD study programmes within the University and industry. Scholarships provided are aimed at providing opportunities for aspiring young Africans to build their capacities to be able to work in an environment that supports growth and sustainable development. The scholarships will provide opportunities for high caliber research to promote the development of science, technology and engineering skills, leadership qualities, and networking with experienced professionals across the world. WACWISA supports a wide range of research activities and, in conjunction with its international, regional, national and industry partners, provides rigorous training programmes in the field of Irrigation and Drainage Engineering, Sustainable Agricultural and Food Systems and Integrated Water Resources and Environmental Management.

8.2 Purpose of the Scholarship Program

The Scholarship Award Scheme (SAS), which is supported by the Government of Ghana (GoG) and the World Bank (WB) is to train promising African students, especially in the West African sub-region in particular and the Africa Region at large. Enrolled students will be supported to develop international and strong industry experience in one or more of the WACWISA's international partners' laboratories and field stations. The scholarship programme is designed to support brilliant African students to study at the Masters (MSc/MPhil) and Doctor of Philosophy (PhD) courses in Water, Irrigation, Drainage, Sustainable Agriculture and Related disciplines within the West African sub-region in particular and the Africa Region. Within this area, the need for highly trained professionals is considered paramount, given the issues of water scarcity, lack of functional irrigation infrastructure as well as emphases on regionalization of agricultural intensification.

8.3 Legal Compliance

The scholarship awards will follow the rules as set out in the WACWISA scholarship scheme as well as governing rules of the Government of Ghana (GoG), the World Bank and the University for Development Studies.

8.4 Guidelines for the Scholarship

The following guidelines will regulate the award of scholarship in the Center:

8.4.1 The Scholarship Selection Committee (SSC)

There will be a Scholarship Selection Committee responsible for the selection of beneficiaries. All Scholarship Selection Committee members must evaluate the eligibility of all applicants without bias and conflicts of interest and make selection recommendations based on the established specific selection criteria for each scholarship. There will be a conscious effort to increase and encourage female applicants for WACWISA scholarships. Selection results and minutes of the SSC indicating all applicants and reasons for selection shall be submitted to the Director of WACWISA. The main functions of the committee will be to:

1. Review all applications for the scholarship scheme,
2. Recommend the most qualified students to be selected for the award of the scholarship WACWISA.
3. Ensure that the selection of applicants is done in an ethical manner based on merit and need,
4. Review of the performance of the successful applicants, and
5. Review and cancellation of scholarships awarded to students (if necessary).

8.4.2 Composition of the Scholarship Committee

There shall be a Scholarship Committee comprising five (5) members, with a keen interest and proven record in providing opportunities for students to achieve their academic goals. The Scholarship Committee shall include:

- | | | |
|--|---|-------------|
| 1. Deputy Director | - | Chairperson |
| 2. Academic Coordinator | - | Member |
| 3. Research Coordinator | - | Member |
| 4. Industry Liaison Officer | - | Member |
| 5. One Academic Head of Department (Appointment by Director) | - | Member |
| 6. Administrative Coordinator | - | Secretary. |

8.4.3 Conflict of Interest and Confidentiality

Members of the Scholarship Selection Committee must sign a Conflict of Interest and Confidentiality form prior to evaluating any scholarship applications. In accordance with this form, the Scholarship Committee members are required to declare any real or potential conflict of interests and to abide by the Conflict of Interest and Confidentiality policies. These forms are kept on file with other scholarship documents and in line with the UDS and Centre's record keeping and document retention policies.

8.4.4 Scholarship Criteria

Scholars are to be selected on an objective and non-discriminatory basis, but with objective of having more females. The intended scholarship application pool from which scholars are selected must be sufficiently broad so that awarding scholarships to one or more members of the group fulfills the objectives of the programme and the Center's objective. Scholarships could be awarded to scholars based upon their exceptional qualifications or geographical location to carry out the purposes of the scholarship based on the Center's Vision, Mission and Objectives.

- Eligibility and/Academic Qualifications

All students who qualify for admission into any of the Centre's programmes of study are eligible to apply for the scholarships. For the avoidance of doubt, students must first secure admission into the Centre's programme of their choice before they can be considered for scholarship. The target groups for the WACWISA scholarship programme are young aspiring Africans who are less than 30 years for the Masters programme and less than 35 years for the PhD programme. All applicants must be nationals of and resident in Africa.

- Award Requirements

To be awarded a scholarship, students must satisfy all the admission requirements for the Centre's academic programme. In addition, students may have to undergo different pre-selection processes including taking qualifying exams and interviews.

- Renewal Requirements

To continue to benefit from the scholarship programme, beneficiary students must maintain their registration on the programmes of study. Thus, renewal of the scholarship will be done annually but students will be assessed by Trimester basis. The scholarships of students who are unable to progress satisfactorily in their programmes of study will not be renewed. Beneficiary students who engage in any acts that are inconsistent with the regulations of the UDS that guide the attitude, behaviour and conduct of students will have their scholarships revoked.

8.4.5 Scholarship Selection Processes

The Center through the Scholarship Committee must devise means to widely advertise the Scholarships. The Committee will determine the deadline for scholarship applications. The ACE Registry shall receive all applications on behalf of the Center and the Scholarship Committee. The Director of the Center shall cause the Scholarship Committee to meet and undertake the selection process of prospective scholars. Further information needed by the Committee will be requested through the Registry.

8.4.6 Withdrawals, Diversion or Deferment

A student shall be withdrawn from the scholarship if he or she goes contrary to the University rules and regulations, the laws of Ghana and the rules guiding the scholarships that may prevent the scholar from pursuing the programme. A student can defer the scholarship for a year if he or she is selected for the scholarship but unable to report due to a personal problem or natural disaster that may render the scholar incapable for reporting for the scholarship. When the said scholar is ready to pick-up the scholarship, his/her acceptance should be based on the availability of funds.

8.4.7 Scholarship Refunds

Scholars are supposed to buy in advance (1 month before reporting) air tickets to report at the Center for their first registration exercise. The cost of the air ticket will be reimbursed to the student upon submission of valid receipts with a cover letter to the Registry through the Scholarship Committee

8.4.8 Scholarship Record Keeping

All records on scholarships shall be kept with the Registry and copies kept by the Chairperson of the Scholarship Committee.

8.4.9 Publicity

The publicity for the scholarship shall be done at the same time of advertising for admission for the study programmes.

8.5 Rules and Regulations Governing the Issuance of Scholarships

1. The scholarship committee reserves the right to review or cancel awards due to changes in financial standing, academic or program status.
2. All scholarship students must be in good standing with the office of judicial and ethical programs, such as the disciplinary committees, etc.
3. All awards are tentative subject to legislative or statutory appropriation, final verification of academic records and acceptance to WACWISA study Programmes.
4. Full-time enrollment in any of the regular post graduate programme is required
5. Scholarship recipients must maintain the required level of performance to continue to benefit from the scholarship.
6. Appeal of scholarship termination might be permitted in certain cases. These cases include those for whom the drop in performance might have been caused by certain extenuating circumstances for instance the occurrence of an illness, which prevented the student in question to take an exam. In all such cases, documentation and the appropriate certification will be sought. The scholarship committee reserves a discretionary right in all such cases.
7. Students receiving scholarship awards who withdraw from the university must notify the scholarship secretariat or office.

8.6 Violation of the Policy

Violation of this policy and procedure or failure to timely cooperate in complying with its provisions may result in disciplinary action up to and including dismissal.

8.7 Scholarship Package

1. Full tuition fee for regional students for the duration of study (PhD 3 years, Masters 2 years).
2. Stipend (Starting in first year for regional students and second year nationals).
3. Relevant equipment, software, 'sold data' and service charges are taken care of by the programme (Note: Equipment and materials bought by the Centre becomes the property of the Centre after students use).
4. Research funding support for PhD and Masters students.
5. Publication fees in Scopus journals shall be taken care of by the programme through lead supervisors.
6. Students may be entitled to Sponsorship for international and local conferences (Note: This depends on acceptance of abstracts and justification by student and lead supervisor as well as most importantly availability of funds).
7. All students shall undertake four to six weeks of internship with some stipend for “cushioning”.
8. International students are accommodated in the programme's hostel and where necessary in other hostels.
9. Non-English-speaking international students may be given approximately 3 months of free English tuition.

WACWISA Scholarship Plan

| MASTERS StudentsGhanaians | | | |
|----------------------------------|---------------|---------------|---------------|
| Component | Year 1 | Year 2 | Year 3 |
| Accommodation | | | |
| Tuition | | | |
| Research Support | X | | |
| Stipend | X | | |
| PhD Students Ghanaians | | | |
| Accommodation | | | |
| Tuition | | | |
| Research Support | | | |
| Stipend | X | | |
| Masters StudentsRegional | | | |
| Accommodation | | | |
| Tuition | | | |
| Research Support | X | | |
| Stipend | | | |
| PhD Students Regional | | | |
| Accommodation | | | |
| Tuition | | | |
| Research Support | | | |
| Stipend | | | |

9.0 SEXUAL HARASSMENT POLICY

All the conduct of faculty, staff, students and partners of WACWISA must be abided by the UDS sexual harassment policy. The UDS Policy describes sexual harassment as unlawful and distasteful, as it violates the rights of self- determination and bodily integrity of the affected person(s). It creates fear and anxiety with immediate and lasting effects on the affected. The effects of sexual harassment could be personal and social. All stakeholders must acquaint themselves with provisions of the policy available online at <https://uds.edu.gh/sexual-harassment-policy/>.

APPENDIX

WACWISA PhD Student Study Timelines

| Time Line | Activity |
|----------------------------------|--|
| <i>First Year (Trimester 1)</i> | |
| September | Student report, register and follow course modules |
| September | Welcome and Orientation |
| October | Students meet supervisors and start thesis proposal fine tuning |
| November | Students present seminar on thesis proposal |
| November | Students undertake field visits/tour to industry |
| November – December | Revision of proposal and planning for field/laboratory work |
| | |
| <i>First Year (Trimester 2)</i> | |
| January -April | Student report, register and follow course modules |
| January -April | Students review literature in their research areas |
| January -April | Students present seminar on revised thesis proposal |
| January - April | Students undertake field visits/tour to industry |
| January -April | Students plan field/laboratory work with WACWISA Research Coordinator |
| | |
| <i>First Year (Trimester 3)</i> | |
| June – July | Students undertake internship training in industry |
| June - July | Students continue with literature review |
| July | Students present seminar to industry and academic staff |
| August | Students submit field/internship reports |
| | |
| <i>Second Year (Trimester 1)</i> | |
| September | Research Initiated |
| September – November | Students present monthly seminars on progress report of thesis |
| September -December | Students continue to work with supervisors |
| December | Students submit thesis progress report to Supervisors and WACWISA Research Coordinator |
| | |
| <i>Second Year (Trimester 2)</i> | |
| June – July | Research works progresses into data collection |
| January -April | Field/laboratory experiments for data collections are started |
| January -April | Supervisory visits to students' experimental sites |
| January - March | Students present monthly seminars on progress report of thesis |
| April | Students submit thesis progress report to Supervisors and WACWISA Research Coordinator |
| | |
| <i>Second Year (Trimester 3)</i> | |
| May -July | Data collection and other research works continuous |
| May -July | Supervisory visits to students' experimental sites |
| July | Students present seminar on progress on research/ field work . |
| August | Students submit thesis progress report to Supervisors and WACWISA Research Coordinator |

| <i>Third Year (Trimester 1)</i> | |
|---------------------------------|--|
| September -December | Students finalise field/laboratory data collection |
| September -December | Students continue data analysis and writing of thesis |
| September -December | Students present monthly seminars on progress report of thesis |
| December | Students submit thesis progress report to Supervisors and WACWISA Research Coordinator |
| <i>Third Year (Trimester 2)</i> | |
| January – April | Thesis write -up |
| March | Students present monthly seminars on progress report of thesis |
| <i>Third Year (Trimester 3)</i> | |
| May | Mini-Viva Presentation |
| June | Submission of thesis for examination |
| August | Viva Voce, finalisation and submission of thesis |

Student Research - Progress Report Template
West Africa Centre for Water, Irrigation and Sustainable Agriculture (WACWISA)

WACWISA Student Progress Report on Thesis Research

Year/Trimester.....

o Name of Student/Student ID Number:

o Name of Supervisors:

- Principal Supervisor

- Co-Supervisor

o Institution:

o Country of Research:

o Thesis Research Title:

1. Reporting Period (dd/mm/year)
2. Dates when student met with Supervisors
3. Summary of Progress
2. Major Achievements with Period
3. Problems Encountered and Solutions

Signature of Student..... Date.....

Signature of Principal Supervisor..... Date

Supervisory Meeting Form

Date of Meeting:.....

Name of Supervisor(s):.....

Name of Student:

Focus/Topic of Meeting:

Main Points Discussed (progress achieved/difficulties discussed etc.)

Agreed Plan of Action (including any changes to skills development plans) with timings:

Form Completed by (Name of Student):

Date:

Certified by Supervisor(s):

WACWISA
Students Guide-Handbook

