

**WEST AFRICA CENTRE FOR WATER IRRIGATION AND SUSTAINABLE
AGRICULTURE (WACWISA)**

**UNIVERSITY FOR DEVELOPMENT STUDIES
TAMALE, GHANA**



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

STUDENT GUIDE/HANDBOOK

REVISED: MARCH, 2020

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.
- Climate and Climate Change

The Centre is envisioned to *“be a leading world-class academic and research Centre specialized in irrigation, water resources, sustainable agriculture and climate change”*. 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

2.0 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.

The vision, mission, aims and objectives of WACWISA are geared towards achievement of the 2017-2023 strategic goals of the University for Development Studies. The Strategic document can be obtained from <https://uds.edu.gh/uds-strategic-plan-2/>.

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, sustainable agriculture and climate change”.

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 Management, Sustainable Agricultural and Food Systems as well as Climate Change;
- 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.

3.0 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

- School of Engineering
- Faculty of Agriculture
- Faculty of Natural Resources and Environment

4.0 Guidelines for Faculty and Graduate Students

4.1 Registration

- i. 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.
- ii. 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 documents of the University:
 - a. Research Ethics Policy – Details available at:
<https://wacwisa.uds.edu.gh/downloads/documents/research-ethics-policy/>
 - b. Ethics Policy - Details available at:
 - c. <https://wacwisa.uds.edu.gh/downloads/documents/ethics-policy/>
 - d. Mentoring Policy - Details available at:
<https://wacwisa.uds.edu.gh/downloads/documents/mentoring-policy/>
 - e. Mentoring Handbook - Details available at:
<https://wacwisa.uds.edu.gh/downloads/documents/mentoring-handbook/>
 - f. Policy on Consultancy Services - Details available at:
<https://wacwisa.uds.edu.gh/downloads/documents/uds-policy-on-consultancy-services/>
 - g. Policy Guidelines on Research Involving Humans and Other Living Organisms - Details available at: <https://wacwisa.uds.edu.gh/downloads/documents/uds-policy-guidelines-involving-humans-and-living-organisms/>
 - h. SOPs for Ethics Review of Research Involving Humans and Other Living Organisms - Details available at: <https://wacwisa.uds.edu.gh/downloads/documents/uds-research-standard-operating-procedures/>

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:

Table 2: Words/Page Limitation

Degree	Minimum	Maximum
MSc.	60 pages/15,000 words	100 pages/25,000 words
MPhil	120 pages/35,000 words	150 pages/37,500 words
PhD	200 pages/50,000 words	300 pages/75,000 words

- vi. In special cases dissertations/theses with number of pages outside the above ranges may be accepted by the Board subject to recommendations by the Departmental/Faculty Committee/WACWISA on Graduate programmes
- vii. Other forms of thesis presentation are subject to Graduate Board approval
- viii. Three soft bound copies of the draft dissertation/thesis shall be submitted through the Head of department and WACWISA Academic Coordinator to the Dean of Graduate School, who shall arrange for its examination. The size shall be standard A4 paper except for drawings, maps and other materials on which no restriction is placed. Where the dissertation/thesis is typed, only one side of the paper shall be used with a margin of 5 cm on the left-hand side of the paper, with a font size 12, and 2.0 line spacing, using Times New Roman. After the dissertation/thesis has been approved, it must be bound in standard form *Art Vellum* or cloth; overcast; edges uncut; lettered boldly up spine in gold (0.5 – 1.25 cm) degree; name and year. This should be done before the award of the degree is published by the Registrar.

5.3 Standard Dissertation/Thesis Format

The writing of dissertations and theses is part of the requirements for the award of higher degrees at the University for Development Studies. No higher degree will be conferred until the approved specifications for the writing of dissertations and theses are met. All dissertations/theses consist of three categories of materials, namely: the preliminaries or front matter, the text or the main body of the report, and the back matter (reference and appendices).

The Preliminaries

The preliminaries begin with the spine, outside cover, declaration, abstract, acknowledgement, dedication (optional), table of content, list of tables, list of figures and illustrations and list of acronyms.

Spine

On the SPINE is printed the DEGREE, the FULL NAME of the candidate and the YEAR of the presentation, in that order; (three blocks). The information specified in brackets below must be provided in horizontal order:

[Name of Degree]

[Full name of candidate]

[Year]

For example, the spine of Ahmed Alhassan` s MSc dissertation will look like:

MSc. AHMED ALHASSAN 2019
Outer Cover

On the Cover, UNIVERSITY FOR DEVELOPMENT STUDIES, WEST AFRICAN CENTRE FOR WATER, IRRIGATION AND SUSTAINABLE AGRICULTURE must be printed at the top of page, (12 single spaces or 5 cm from the top of the page), the TITLE OF THE REPORT/THESIS in the middle of the page and the author`s FULL NAME (without titles) and the YEAR of presentation printed at the bottom half of the page (four blocks). The information specified in the brackets below must be provided in vertical order:

[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:

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

BY
AHMED ALHASSAN
(BSc. Agricultural Technology, MSc. Irrigation and Drainage Engineering)
(UDS/MAG/006/08)

[DISSERTATION/THESES 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]

DECEMBER 2019

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 Management
- Doctor of Philosophy (PhD) Integrated Water Resources 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

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.

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 Management (IWRM)

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 Two: Trimester Two

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	Detail Activities of the Programme for the 4 Years		Credit Load
1	1 st Trimester	Students to register and follow MPhil courses with examination including Seminar I (IDE 701) Research Proposal Presentation.	20
	2 nd Trimester	Students to register and follow MPhil courses with examination including Seminar II (IDE 704).	19
	3 rd Trimester	IDE 599: Integrated Field Assignment	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 Field Assignment	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	Seminar VII (IDE 799): Students finalize their research articles (manuscripts) for publication and also present seminar on the progress of work.	3
4	1 st Trimester	IDE 899: Student Research Project	6
	2 nd Trimester	IDE 899: Student Research Project	
Total Credit			69

7.4.2 Description of the Programme – PhD Irrigation and Drainage Engineering

Year One: Trimester One (20 Credits)

Students will register and follow all MPhil courses in Irrigation and Drainage Engineering.

Year Two: Trimester One (19 Credits)

Students will register and follow all MPhil courses in Irrigation and Drainage Engineering for the Trimester.

Year One: Trimester Three (4 Credits)

IDE 599: Integrated Assignment and Field Practical

Students will undertake a compulsory 8 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 (3 Credits)

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 (3 Credits)

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 (4 Credits)

Students will use this period to continue to monitor field research works and as well present seminar on the progress made. They will identify a core irrigation and drainage problem and as well draft a position paper to solve the problem for industry. They will present a comprehensive report and also a seminar for assessment.

Year Three: Trimester One

IWRM 731: Seminar V (3 Credits)

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 (3 Credits)

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: Seminar VII

(3 Credits)

Students present seminar on the progress of work and finalising the field/laboratory works.

Year Four: Trimester One

IDE 899: Doctoral Thesis (Student Research Thesis)

(6 Credit)

Students register their doctoral thesis and present seminars on progress of work. Students present preliminary research findings and draft their thesis. Seminar presentations may be up to 3 for the trimester.

Year Four: Trimester Two

IDE 899: Thesis

Student submit independent, practical oriented and problem-solving research work as a bound copy for assessment. This shall include evidence of 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: Courses for PhD Integrated Water Resources 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	19
		Seminar I (IWRM 515) Research Proposal (seminar 1)	1
	2 nd Trimester	Students to register and follow MPhil courses with examination.	21
		Seminar II (IWRM 518): Finalised Research Proposal Presentation/Proposal progress report (At least 2 seminars in the trimester).	1
3 rd Trimester	IWRM 599: Integrated Field Assignment	4	
2	1 st Trimester	Seminar III (IWRM 621): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester)	3
	2 nd Trimester	Seminar IV (IWRM 622): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester)	3
	3 rd Trimester	IWRM 699: Integrated Field Assignment	4
3	1 st Trimester	Seminar V (IWRM 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 (IWRM 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	Seminar VII (IWRM 799): Students finalize their research articles (manuscripts) for publication and also present seminar on the progress of work.	3
4	1 st Trimester	IWRM 899: Student Research Project	6
	2 nd Trimester	IWRM 899: Student Research Project	
Total Credit			70

7.5.2 Doctor of Philosophy: Integrated Water Resources Management

Year One: Trimester One (20 Credits)

Students will register and follow all MPhil courses in Integrated Water Resources Management.

Year Two: Trimester One (22 Credits)

Students will register and follow all MPhil courses in Integrated Water Resources Management.

Year One: Trimester Three (4 Credits)

IWRM 599: Integrated Field Assignment

Students will undertake a compulsory 8 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

IWRM 621: Seminar III (3 Credits)

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

IWRM 622: Seminar IV (3 Credits)

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

IWRM 699: Integrated Field Assignment (4 Credits)

Students will use this period to continue to monitor field research works and as well present seminar on the progress made. They will identify a core water resources management problem and as well draft a position paper to solve the problem for industry. They will present a comprehensive report and also a seminar for assessment.

Year Three: Trimester One

IWRM 731: Seminar V (3 Credits)

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

IWRM 732: Seminar VI (3 Credits)

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

IWRM 799: Seminar VII (3 Credits)

Students present seminar on the progress of work and finalising the field/laboratory works.

Year Four: Trimester One

IWRM 899: Doctoral Thesis (Student Research Thesis)**(6 Credit)**

Students register their doctoral thesis and present seminars on progress of work. Students present preliminary research findings and draft their thesis. Seminar presentations may be up to 3 for the trimester.

Year Four: Trimester Two**IWRM 899: Thesis**

Student submit independent, practical oriented and problem-solving research work as a bound copy for assessment. This shall include evidence of 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).

7.6 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	17
		Seminar I (SAF 515) Research Proposal (seminar 1)	1
	2 nd Trimester	Students to register and follow MPhil courses with examination.	17
		Seminar II (SAF 518): Finalised Research Proposal Presentation/Proposal progress report (At least 2 seminars in the trimester).	1
3 rd Trimester	SAF 599: Integrated Field Assignment	4	
2	1 st Trimester	Seminar III (SAF 621): Presentations of Progress report on Research/Field work (At least 3 Seminars in the trimester)	3
	2 nd Trimester	Seminar IV (SAF 622): 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	Seminar VII (SAF 799): Students finalize their research articles (manuscripts) for publication and also present seminar on the progress of work.	3
4	1 st Trimester	SAF 899: Student Research Project	6
	2 nd Trimester	SAF 899: Student Research Project	6
Total Credit			65

7.6.2 Doctor of Philosophy: Sustainable Agricultural and Food Systems

Year One: Trimester One (18 Credits)

Students will register and follow all MPhil courses in Sustainable Agricultural and Food Systems.

Year Two: Trimester One (18 Credits)

Students will register and follow all MPhil courses in Sustainable Agricultural and Food Systems.

Year One: Trimester Three (4 Credits)

SAF 599: Integrated Field Assignment

Students will undertake a compulsory 8 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

SAF 621: Seminar III (3 Credits)

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 622: Seminar IV (3 Credits)

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 Field Assignment (4 Credits)

Students will use this period to continue to monitor field research works and as well present seminar on the progress made. They will identify a core water resources management problem and as well draft a position paper to solve the problem for industry. They will present a comprehensive report and also a seminar for assessment.

Year Three: Trimester One

SAF 731: Seminar V (3 Credits)

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 (3 Credits)

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: Seminar VII (3 Credits)

Students present seminar on the progress of work and finalising the field/laboratory works.

Year Four: Trimester One

SAF 899: Doctoral Thesis (Student Research Thesis)

(6 Credit)

Students register their doctoral thesis and present seminars on progress of work. Students present preliminary research findings and draft their thesis. Seminar presentations may be up to 3 for the trimester.

Year Four: Trimester Two

SAF 899: Thesis

Student submit independent, practical oriented and problem-solving research work as a bound copy for assessment. This shall include evidence of 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).

Year Four: Trimester Two

IWRM 899: Thesis

Student submit independent, practical oriented and problem-solving research work as a bound copy for assessment. This shall include evidence of 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).

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)**, Tamale-Ghana is designed to guide the administration of scholarships offered to deserving students by the Centre. Scholarships are awarded for Internships, Short Courses, Masters and Doctor of Philosophy (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 - world class 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, Integrated Water Resources Management, Sustainable Agricultural and Food Systems, etc.

8.2 Purpose of the Scholarship Program

The Government of Ghana (GoG) and the World Bank (WB) are supporting the **Scholarship Award Scheme (SAS)** for the training of young and promising African students, especially in the West African sub-region and the Africa Region at large. Enrolled students will be supported to develop strong academic and research experience through training at international levels and also strong industry experience in one or more of the WACWISA's international partners' laboratories and industry partners field laboratories through internships. The scholarship programme is designed to support brilliant African students to study at the Masters and Doctor of Philosophy (PhD) level in courses in the area of Water, Irrigation, Drainage, Sustainable Agriculture, Climate Change as well as related disciplines as well as Short Professional Courses and internships. Within this area, the need for highly trained professionals is considered paramount, given the issues of climate change, water scarcity, high incidence of food insecurity and malnutrition, lack of functional irrigation infrastructure as well as emphasis on regionalization of agricultural intensification.

8.3 Legal Compliance

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

8.4 WACWISA Scholarships Guidelines

The following sub-sections present guidelines that will regulate the award of scholarships in the Centre.

8.5 Scholarships Selection Committee (SSC)

There will be a Scholarships Selection Committee (SSC) responsible for the selection of beneficiaries. All SSC 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 SSC will include:

1. Review of all applications for the scholarships scheme;
2. Recommend the most qualified applicants to be selected for the award of the scholarships;
3. Ensure ethical and merit-based selection of applicants;
4. Monitor and review the performance of the successful applicants regularly, and;
5. Review and cancellation of scholarships awarded to students (if necessary).

8.6 Scholarships Committee Composition

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

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

8.7 Conflict of Interest and Confidentiality

Members of the Scholarships Selection Committee (SSC) **must** sign a Conflict of Interest and Confidentiality form (Appendix A) prior to evaluating any scholarship applications. In accordance with this form, the Scholarships 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 filed together with other scholarships documents and in line with the Centre's record keeping and document retention policies.

8.8 Scholarships Selection 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 cohort fulfills the objectives of the programme and the Centre'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 Centre's Vision, Mission and Objectives.

8.8.1 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 University for any of the Centre's programme of their choice before they can be considered for scholarships. The target groups for the WACWISA scholarships programme are young aspiring Africans who are **not more than 35 years** for the Masters programme and **not more than 40 years** for the PhD programme. All applicants must be **nationals of and resident in Africa**.

8.8.2 Awards Requirements

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

8.8.3 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 on Trimester basis. Assessments of students will be undertaken following the reports received from Departments of students and Supervisors. The scholarships of students who are unable to progress satisfactorily in their programmes of study will not be renewed. Beneficiary students who engage in acts that are inconsistent with the regulations of the University that guide the attitude, behaviour and conduct of students as contained in the Junior Members Rules and Regulations of the University (<https://uds.edu.gh/#>) will have their scholarships revoked.

8.8.4 Scholarships Selection Processes

WACWISA through the Scholarships Committee shall widely advertise calls for the award of Scholarships and the associated deadlines on twice a year (**April - May and September - October**) basis. The Centre's Administrative Registry shall receive all applications. All applicants must submit applications for admission into the relevant programme at the University for Development Studies, Tamale – Ghana available at <https://uds.edu.gh/admissions>. For further information, you may visit <https://wacwisa.uds.edu.gh/> or <https://uds.edu.gh/>.

The scholarships applications portal is opened following the call/advert for proposals for a period of not more than two (2) months. The Director of the Centre shall cause the Scholarships Committee to meet and undertake the selection process of prospective scholars based on the established selection criteria. The whole scholarships selection process, from advertisement/call through screening/shortlisting/ranking/interviewing to selection shall not exceed three (3) month. Successful applicants are informed of their preliminary selection or conditional offers via emails. The awards/offers are confirmed after their acceptance and meeting of conditions (if any). WACWISA will send the Confirmation of Awards Letters to successful applicants via email and also publish the names of awardees including programmes of study, gender and nationalities on its Website - <https://wacwisa.uds.edu.gh/#>.

8.9 Frequency and Duration of Scholarship Advertisement/Award

Scholarships shall be advertised **twice a year** for a period of two (2) months each. The periods for scholarship advertisements shall be:

- **April - May**

- **September - October**

Scholarships shall therefore be awarded twice a year for students to take-up scholarship offers and start academic work in September and January of every year.

The shortlisting, screening and ranking of candidates for award of scholarships shall be for a period of up to three (3) months.

8.10 Scholarship Application Submission

Applicants shall submit all requested information regarding scholarship application through the following addresses: wacwisa@uds.edu.gh or director_wacwisa@uds.edu.gh.

8.11 Withdrawals, Diversions or Deferments

A student shall be withdrawn from the scholarship if s/he goes contrary to 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 s/he 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. In such situations the scholar shall be required to provide convincing documentary evidence to support the need for the deferment. When the said scholar is ready to pick-up the scholarship, his/her acceptance will be based on the availability of funds.

8.12 Scholarships Refunds

The WACWISA scholarships scheme shall not refund any expenditure incurred by scholars prior to they taking up the award. For the avoidance of doubt, WACWISA shall not reimburse scholars for air tickets or transport to the Centre to take up their awards. However, under exceptional circumstances, the Centre might reimburse the travel costs of female scholars upon submission of valid receipts with a cover letter to the Director (if air tickets and bus tickets were purchased for at least a month before travel).

8.13 Scholarships Record Keeping

All scholarship records and related documentation shall be kept in the administrative office of the WACWISA Director.

8.14 Publicity

The publicity for the scholarship shall be done as widely as possible using the Centre's Website, the University Website and Social Media e.g. Twitter, Facebook, LinkedIn, WhatsApp, etc.

8.15 Rules and Regulations Governing the Issuance of Scholarships

1. The Scholarships Committee reserves the right to review or cancel awards due to changes in financial standing, academic or programme status of the Centre.
2. All scholars must be in good standing with the office of judicial and ethical programmes, 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 academic 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 academic 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 Scholarships Committee reserves a discretionary right in all such cases.
7. Students receiving scholarship awards who withdraw from the University must notify the Director of WACWISA officially in writing.

8.16 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 withdrawal from the scholarship.

8.17 Scholarship Package

1. Tuition, Research and Learning Costs: tuition, registration, examination, matriculation, Student Identity Card, ICT and library for regional students for the duration of study as Masters or PhD students.
2. Stipend for regional students starting first year of study and local (Ghanaian) students starting in second year following outstanding academic performance.
3. Student stipend shall include the costs of accommodation, living expenses, health insurance and other personal incidentals.
4. The Centre shall pay for relevant equipment, software, service charges, laptops, etc. to aid the students' research work. NB: Equipment and Materials acquired through funds of the Centre are the property of the Centre after students use.
5. PhD and Masters students research work shall be supported with the available funds to include expenses such as field transport, costs of field data collection, software, and other student project related costs. The budget shall be approved by the Supervisor (s), Research Coordinator and Director of WACWISA before disbursement of funds.

6. Disbursement of funds; Students' stipends will be paid into their individual bank accounts. However, students research grants will be handled by the Centre and releases will be made in consultation with Supervisor(s) of the students.
7. Publication fees in Scopus journals/ISI shall be borne by the Centre through lead Supervisors/Centre authors.
8. Students may be supported to attend international and local conferences if abstracts are accepted and/or there is justification by student and lead supervisor for attendance. This is contingent on the availability of funds.
9. All students shall undertake up to eight (8) weeks of internship with industry and shall be entitled to some stipend during the internship.
10. Non-English-speaking international students **may** be recommended to attend English language tuition training for a period of ten (10) weeks at the French Language Centre of the University. Approval of the Director is required for any student to attend such a training.

Summary of the Scholarships Plan

Ghanaian Students				
Masters				
	Year 1	Year 2	Year 3	Year 4
Accommodation	✓	✓		
Tuition	✓	✓		
Research grant	X	✓		
Stipend	X	✓		
Laptop	X	✓		
PhD				
Accommodation	✓	✓	✓	✓
Tuition	✓	✓	✓	✓
Research grant	X	✓	✓	✓
Stipend	X	✓	✓	✓
Laptop	X	✓	X	X

Regional Students				
Masters				
	Year 1	Year 2	Year 3	
Tuition	✓	✓		
Accommodation	✓	✓		
Laptop	✓	X		
Research grant	X	✓		
Stipend	✓	✓		
PhD				
Accommodation	✓	✓	✓	✓
Tuition	✓	✓	✓	✓
Laptop	✓	X	X	X
Research grant	X	✓	✓	✓
Stipend	✓	✓	✓	✓

8.18 Further Information on Scholarships

The Director

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

University for Development Studies

Tamale, Ghana

Email: director_wacwisa@uds.edu.gh

Phone: +233 (0)3720-99728

Website: <https://wacwisa.uds.edu.gh>

Twitter @wacwisa

LinkedIn @ <https://www.linkedin.com/company/wacwisa/>.

The Administrator

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

University for Development Studies

Tamale, Ghana

Email: wacwisa@uds.edu.gh

Phone: +233 (0)3720-99728

Website: <https://wacwisa.uds.edu.gh>

Twitter @wacwisa

LinkedIn @ <https://www.linkedin.com/company/wacwisa/>.

8.19 Communication of Awards

WACWISA shall contact all applicants on the status of their application after the SSC has duly completed the process of selection. Notification shall be email communication through the following email addresses wacwisa@uds.edu.gh or director_wacwisa@uds.edu.gh.

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/>. In the event of aggressive sexual harassment/misconduct such as rape or any other emergency situations, please call the National Emergency Contact Number: 112 to access Police, Fire, and Ambulance services.

10.0 Student Welfare

WACWISA has a designated officer in charge of Student's Welfare. The designated portfolio in WACWISA is known as Students Welfare Desk Officer and this serves to coordinate students' welfare issues within the general University setup. The responsibility of the Students' Welfare Officer includes:

- i. Assign students (tutees) to Senior Members (Tutors) for the purpose of mentoring.
- ii. To work jointly with other established University units to provide services and programmes that will enhance students' life and wellbeing;
- iii. Attend to students concerns and needs which may affect their academic work;
- iv. Serve as point of contact for students with issues relating to harassment, discrimination, sexual misconduct and as a voice and advocate for students' welfare issues, rights and concerns;
- v. Provision of support to students relating to registration and acquisition of residence permit, health insurance, scholarship issues, etc;
- vi. Liaises with Management of WACWISA and other relevant University Units to organise career guidance and counselling seminars for students and other educative programmes;
- vii. Responsible for students' accommodation issues and wellbeing.

The Welfare Desk Officer also works together with the following units of the University:

- a. Office of the Dean of Students Affairs
 - i. Residential Facilities
 - ii. Guidance and Counselling UnitDetails Available at: <https://uds.edu.gh/office-of-dean-of-students-affairs/>
- b. Directorate of International Relations and Advancement (DIRA): Details available at: <https://uds.edu.gh/directorate-of-international-relations-and-advancement/>
- c. Directorate of University Health Services
- d. Directorate of University Sports. Details available at: <https://uds.edu.gh/directorate-of-sports/>
- e. Graduate Students Association of Ghana. Details available at: <https://uds.edu.gh/grasag/>

11.0 University Resource Centres

The University for Development Studies have a number of resources centres with different programmes and activities to support the academic and research agenda of the University. These include:

- a. University Library
- b. Directorate of ICT
- c. French Language Centre
- d. Directorate of Sports
- e. Dean of Students Affairs
- f. Directorate of International Relations and Advancement
- g. University Basic Schools

11.1 University Library

The Library's mission is to develop and provide access to relevant and well-balanced information collection in all formats for use by students, Faculties and the public, and to maximise the use of information for development and life-long learning. This has informed the Library's operations and helped it to improve upon service delivery to users over the years. The Library has in stock, a total of about 55,000 volumes of books.

Some of the initiatives of the Library include automation of library services, online catalogue, anti-plagiarism scan services (the Anti-plagiarism Policy is found at this link: https://www.udslibrary.net/wp-content/uploads/2019/01/UDS_Plagiarism-Policy-2.pdf). It provides access to e-resources such as online database, Institutional Repository which showcases the University's intellectual output (theses, reports, articles) globally and most importantly giving their users access to local content. Also, UDSspace preserves and enables easy and open access to online collection of Student achievements, Faculty research, and the University Archival Materials. This encompasses all types of digital content including Text, Images, Moving images, Mpegs and Data Sets.

This can be obtained through this link: <http://www.udsspace.uds.edu.gh/handle/123456789/38>
The University online library services are available at: <https://www.udslibrary.net/>. This site has the following services:

- i. A-Z Databases
- ii. Free Journals and Books
- iii. Off-campus Access
- iv. APA Reference Guide
- v. Plagiarism Scan
- vi. UDS International Journal of Development
- vii. Online Catalogue
- viii. UDSspace (IR)

Details of the University Library and its Services are available at: <https://uds.edu.gh/library/>

11.2 Directorate of ICT

The Directorate of ICT provides ICT support services to the University in line with the University's strategic plan. Some of the services of the Directorate include:

- i. E-Service Delivery support services for students' academic information including academic transcript, language proficiency, introductory letters.
- ii. Cloud Storage for centralised data storage and safeguarding information as backup where data can be readily available and/or accessible (for only authorised users) for administrative purposes across all Campuses of the University.
- iii. E-counselling offers counselling services to students irrespective of their locations and on real time. The service is delivered via a private portal where a series of private written exchanges between a student and a professional counsellor is provided in a confidential manner. This initiative is providing counselling services to students during circumstances when face-to-face appointments with counsellors may be impossible /difficult.
- iv. University-Wide Fibre Network provides a more efficient network connectivity and reliable internet service across all Campuses.

Details of activities of the Directorate of ICT is available at <https://uds.edu.gh/directorate-of-ict/>

11.3 French Language Centre

The Centre receives support mainly from the French Embassy in Ghana. The rationale is to train bilingual graduates to take advantage of Ghana's strategic location in the West African sub region and also highlight the importance of French in regional integration and global discourse. The languages currently being taught at the Centre are English and French. Students in the University can apply and join in free language proficiency training and possible certification. Detail information about the Centre is available at: <https://uds.edu.gh/french-language-center/>

11.4 Directorate of Sports

The Directorate is in charge of the sporting activities and facilities of the University. It provides access to well standard facilities and coaching services to both staff and students for the purpose of physical exercising. Details of the activities of the Directorate are available at: <https://uds.edu.gh/directorate-of-sports/>

11.5 Office of Dean of Students Affairs

The Office of the Dean of Students' Affairs is one of the key organs of the University's Management. The main office which is situated in the Central Administration building, Tamale Campus, has supporting offices at all the four campuses of UDS. The office works with the support of the entire management and more especially with the offices of the Vice Deans of Students, Counselling Units and Senior Hall Tutors to provide general welfare services to the various students' groups on the campuses. It further serves as the link between the University management and the various students' bodies.

Details of the activities of the Office of the Dean of Students is available at: <https://uds.edu.gh/office-of-dean-of-students-affairs/>

11.6 Directorate of International Relations and Advancement

The Directorate is under the Vice-Chancellor's Office, responsible for connecting UDS to other academic institutions around the world strengthening international linkages and fostering international co-operation. The Directorate also seeks to encourage staff and students' development through exchanges, participation in international conferences, collaborative research, and other activities. The directorate also works on the advancement of the University by leveraging on its international linkages to raise funds for the University and selling UDS programmes to the international community. It also works directly with international students on issues that affect the academic work and welfare. Details of the Directorate is available at: <https://uds.edu.gh/directorate-of-international-relations-and-advancement/>

11.7 University Basic Schools

The University has two basic schools on the Tamale and Nyankpala campuses to take care of the educational needs of staff and students on the campuses as well as the neighbouring communities. The management of the Schools is directly undertaken by the University in the form of provision of teaching and learning resources.

APPENDIX

WACWISA PhD Student Study Timelines

Time Line	Activity
<i>First Year (Trimester 1)</i>	
September	Students report, register and follow course modules
September	Welcome and Orientation
October	Students meet supervisors and start theses proposals fine tuning
November	Students present seminar on theses proposals
November	Students undertake field visits/tour to industry
November – December	Revision of theses proposals and planning for field/laboratory work
<i>First Year (Trimester 2)</i>	
January-April	Students report, register and follow course modules
January-April	Students review literature in their research areas
January-April	Students present seminar on revised theses proposals
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	Students report and register
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	Students report and register
September	Research Initiated
September – November	Students present monthly seminars on progress report of theses
September-December	Students continue to work with supervisors
December	Students submit theses progress reports to Supervisors and WACWISA Research Coordinator
<i>Second Year (Trimester 2)</i>	
January	Students report and register
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 theses
April	Students submit theses progress reports to Supervisors and WACWISA Research Coordinator

<i>Second Year (Trimester 3)</i>	
May	Students report and register
May - August	Data collection and research works continue
May - August	Supervisory visits to students' experimental sites
July - August	Students present seminar on progress on research/field work.
August	Students submit theses progress reports to Supervisors and WACWISA Research Coordinator
<i>Third Year (Trimester 1)</i>	
September	Students report and register
September-December	Students finalise field/laboratory data collection
September-December	Students continue data analyses and writing of theses
September-December	Students present monthly seminars on progress reports of theses
December	Students submit theses progress reports to Supervisors and WACWISA Research Coordinator
<i>Third Year (Trimester 2)</i>	
January	Students report and register
January – April	Students continue data analyses and writing of theses
January - April	Students present monthly seminars on progress reports of theses
<i>Third Year (Trimester 3)</i>	
May	Students report and register
May - August	Students continue data analyses and writing of theses
July - August	Students submit theses progress reports to Supervisors and WACWISA Research Coordinator
<i>Fourth Year (Trimester 1)</i>	
September	Students report and register
September-December	Students continue data analyses and writing of theses
September-December	Students present monthly seminars on progress reports of theses
December	Students submit theses progress reports to Supervisors and WACWISA Research Coordinator
January	Students report and register
January	Mini-Viva Presentations
January – April	Submission of theses for examination
January - April	Viva Voce, finalisation and submission of theses

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

WACWISA Student Progress Report on Thesis Research

Year/Trimester.....

- **Name of Student/Student ID Number:.....**
- **Name of Supervisors:**
 - **Principal Supervisor**
 - **Co-Supervisor**
- **Institution:**
- **Country of Research:**
- **Thesis Research Title:**

- 1. Reporting Period (dd/mm/year)**
- 2. Dates when student met with Supervisors**
- 3. Summary of Progress**
- 4. Major Achievements with Period**
- 5. 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):