UPSA
UNIVERSITY OF PROFESSIONAL STUDIES, ACCRA
Scholarship with Professionalism

ACBSP
ACCREDITED

RESEARCH ADMINISTRATION AND MANAGEMENT
HANDBOOK

UNIVERSITY OF PROFESSIONAL STUDIES, ACCRA (UPSA)

RESEARCH ADMINISTRATION AND
MANAGEMENT HANDBOOK

A publication of the Research and Consultancy Centre, UPSA.

PREFACE

Researchers, support staff and administrative officers must have a clear understanding of each other's role to ensure effective administration and management of the research enterprise in the University. Accordingly, this handbook is prepared by the Research and Consultancy Centre (RCC) to serve as a reference for all individuals in the university who are involved in the conduct, administration and management of research. The document outlines the systems and structures in place to ensure effective research administration, the roles and responsibilities of individuals and units as they relate to research administration and management. It is our utmost hope that the contents of this handbook will meet your information and assist all those involved in research to perform their duties effectively.

The handbook is organized into 10 sections that articulate the issues related to research administration and management. Section 1 introduces the purpose and objectives of the handbook, the research policy of the university, the scope of the handbook and its applicability and review. Section 2 defines research and development within the university. Section 3 outlines the system and structure in place to support research and defines the roles and responsibilities of individuals and units involved in the system. Sections 4, 5, 6 and 7 cover the entire grants life-cycle. They address grants and research funding, proposal development, review and submission, notification and post-award activities, management of awarded grants, financial matters and closeout. Section 8, 9 and 10 detail the policies on research conduct, proprietary issues and grievance procedures.

ACKNOWLEDGEMENTS

SECTIONAL CONTRIBUTORS

SECTION 1:   Mr. Timothy King Avordeh – Coordinator
                   Research Compliance Unit

SECTION 2:   Mr. Timothy King Avordeh – Coordinator
                   Research Compliance Unit

SECTION 3:   Dr. Albert Martins – Former Deputy Director RCC

SECTION 4:   Mr. Maxwell Yeboah-Mensah – Administrator
                   RCC

SECTION 5:   Dr. Robert Afutu-Kotey - Former Fellow RCC

SECTION 6:   Mr. Timothy King Avordeh – Coordinator
                   Research Compliance Unit

SECTION 7:   Dr. Ibrahim Mohammed – Director of RCC

SECTION 8:   Mrs. Benedicta Quao – Coordinator Consultancy
                   Unit

SECTION 9:   Dr. Mrs. Andaratu Achuliwor – Coordinator IRDS
                   Unit

SECTION 10:   Mr. Samuel Arthur – Coordinator Academic
                   Publication Unit

MANUAL EDITORIAL TEAM

Dr. Haruna Rufai Kilu   -   Chief Editor

Dr. Adam Salifu   -   Associate Editor

Dr. Ibrahim Mohammed   -   Associate Editor

Dr. Andaratu Achuliwor   -   Associate Editor

Miss Rebecca Baah-Ofori -   Associate Editor/Reviewer

Mr. Sadat Mohammed   -   Proof Reader

Mr. Timothy King Avordeh -   Coordinating Secretary

TABLE OF CONTENTS

ACRONYMS

UPSA	University of Professional Studies, Accra
RAMH	Research Administration and Management Handbook
RCC	Research and Consultancy Centre
PI	Principal Investigator
R&D	Research and Development in the University
FRC	Faculty Research Officer
DRO	Director of Research
FRC	Faculty Research Committee
HOD	Head of Department
URB	University Research Board
IRDSU	Institutional Research and Decision Support Unit
RPU	Research Projects Unit
CU	Consultancy Unit
APU	Academic Publication Unit
MBPU	Marketing and Business Promotion Unit
DRC	Departmental Research Committee
RPC	Research Publications Committee
ARR	Annual Research Review
USC	Undergraduate Supervisory Committee
PSC	Postgraduate Supervisory Committee
IFRC	Inter-Faculty Research Committee
RFPs	Request for Proposals
FOAs	Funding Opportunity Announcements
BAAs	Broad Agency Announcements
WIP	Work in Progress
FAC	Facilities and Administrative costs
PFO	Project Finance Officer
DOF	Director of Finance

SECTION 1:

PURPOSE, SCOPE AND APPLICABILITY

1.1 Purpose

The Research and Consultancy Center seeks to improve the research infrastructure and service to the research community of the University of Professional Studies, Accra. In order to achieve this, the Center decided to follow best practice by developing a research administration and management handbook to provide comprehensive guidelines for the conduct of research in the University. The handbook which is referred to as the "UPSA Research Administration and Management Handbook is a collection of campus-wide research-related guidelines and policies governing different Faculties, Departments, Centers, Schools and Units within the university. The handbook is intended to serve as a quick reference for researchers looking for research-related information within the University.

1.2 University's Research Policy

As a higher education provider, University of Professional Studies, Accra (UPSA) recognizes the importance of research and its mandate to contribute to the research enterprise. This recognition has meant that the University

must have a Research Policy document so that all those engaged in research (or the process of research), for, or on behalf of the University can take note and act accordingly. The University's Research Policy can be found at http://www.upsa.edu.gh/index.php/2017-01-29-11-12-36/research-policy

The overarching goal of the Policy is to ensure that research conducted in the name of UPSA or on its premises is consistent with the ethos of the University and conforms to the highest quality, ethical standards and international best practices.

1.3 Justification for a Research Management Handbook

The Handbook is justified because it shall be a unique tool for the promotion of research in the university community. This handbook is specifically designed for the professional development of researchers and for managing interactions with university research administrations and external stakeholders. Although many scientific and technological disciplines have long been organized in this way, few resources have been created to help new researchers understand their roles and responsibilities and to reflect on their practice; hence, the need for this handbook.

This Handbook has been created by the combined experience of senior research fellows from the university.

This handbook will be a standard work of reference for all researchers in any discipline looking to undertake research in this university. The editorial team shall extend its potential use of this handbook in support of training events or workshops where groups of new researchers can come together and explore the issues that are confronting them.

Hopefully, this handbook will create a baseline reference for further research creation that shall lead to a well-defined and structured technical document and also to improve productivity and give better results.

1.4   Document Development Process

The document development process is organized into six phases of work:

1. Establish regulatory framework for research and administration management.
2. Arrange for an internal review of the draft handbook and incorporate the relevant comments, suggestions and changes.

3. Circulate the draft to some Senior Members for inputs and revision accordingly.
4. Submit document to the relevant Committee for inputs and necessary revisions.
5. Present document to Management for consideration and adoption after relevant corrections.
6. Arrange for the publication of the Research Handbook.

1.5   Applicability and Review

This Handbook applies to UPSA and all its employees, students, persons with honorary positions, and other individuals who conduct research (or are involved in the process of research) in, for, or on behalf of the University. In consultation with all relevant stakeholders, the RCC shall be responsible for reviewing the Handbook after every five years.

SECTION 2:

RESEARCH AND DEVELOPMENT IN THE UNIVERSITY

2.1   Research and Development

Research and Development (R&D) is a wide range of academic, governmental and business activities designed by Schools, Faculties, Departments, and Centers in the university to promote knowledge creation and community development. This can be achieved by systematically combining both basic and applied research in knowledge creation. Research output is expected to be innovative, relevant, highly applicable and easy to access for businesses and professional use. It is also the expectation that R & D in the university with a special focus in the fields of management, finance, accounting, communication, strategic leadership and law will expand the frontiers of human understanding using innovations to improve our community and society. The RCC should be the hub of R&D and must work closely with Schools, Faculties, Departments and Centers to achieve the following:

- Development and implementation of the Research plan and policies of the University.
- Identification of core research areas.

- Development of the research capacity of faculty and students.
- General administration of all research activities and research grants.
- Annual submission of UPSA accredited publications to RCC to adjudge the best faculty.
- Undertake collaborative research with individuals and institutions with common areas of interest.

2.2   Areas of Research

Research at UPSA will focus on but not be limited to four (4) thematic areas that reflect the interdisciplinary strengths of faculties.

1. Organizational Management and Strategic Leadership Research

This seeks to promote organizational change, leadership, business ethics and corporate social responsibility. Management and Strategic Leadership are essential for human, organizational and societal progress. This type of research applies science and technology, social and cultural perspectives to organizational management to

inform and support industry players, policy makers, professionals and civil society in decision making.

2. Economic Research

   This area is intended to address national and global economic issues, with emphasis on innovation, competitiveness, inclusive and sustainable development. In addition, research will focus on employment and labour market, value creation, economic institutions, trade and regulations, digital economies, to inform policies at the local, national, regional and international levels.

3. Business and Law Research

   This area of research is aimed at contributing to critical policy issues faced by governments, businesses and society with a focus on corporate and financial laws but extends to other relevant areas of law.

4. Information Technology Research

   In a rapidly changing world, information technology is vital in solving developmental challenges. Researchers in the field delve into understanding the broad field of information and communication technology, particularly how it can

be harnessed to address societal issues such as cybercrimes, health and demographic, food insecurity, and environmental challenges. Research in this field also explores areas such as robotics, artificial intelligence, algorithms, bio computation and data protection.

5. Socio-Cultural Research

This area investigates the past and the present of the Ghanaian society and how it would look and function in the future. The core of research within this theme highlights the interconnectedness of contemporary cultures and the ways in which our past and present influence our thinking and behaviour. Further, this research theme encompasses a variety of human endeavours from questions of race, ethnicity, religion, gender, social class, family traditions, ethics as well as smart systems for modern societies.

2.3 **Research Support**

There are sufficient research structures and services available in the University to support students, faculty and research partners. Faculties and Departments of the University have clearly laid out structures that

promote research. These include the following:

2.3.1 Research support in Faculties

There shall be a Faculty Research Officer (FRO) preferably with the rank of a senior lecturer whose tenure of office shall be for two years which is renewable for another term based on performance. The FRO shall report directly to the Dean of their respective faculty and must work closely with the Departmental Research Officers (DROs). Preferably FROs should be Research Fellows or any faculty member who has a proven track record of both international and local experience in research activities, with at least two publications annually.

Duties

1. To support academic staff in the identification and application for external research funding.
2. To develop and maintain an up-to-date database of research funding opportunities for faculty.
3. To provide support in organizing training courses for faculty in the preparation of grant applications for early and mid-career academic

staff as well as events and meetings relating to research funding.

4. To prepare reports on research activities of the faculty as required by the Dean and Director of the RCC.

5. To provide administrative support for the preparation of the Annual Research Report by the RCC.

6. To execute any other relevant task as assigned by Dean and the Director of the RCC.

2.3.2 Research Support in Departments

There shall be a Departmental Research Officer (DRO) preferably with the rank of a lecturer whose tenure of office shall be for two years which is renewable subject to performance. The DRO shall be responsible for all research related activities in the department and shall report directly to the Head of Department (HOD). The DRO must preferably be a departmental staff who has a track record of publishing at least an article in a reputable journal per annum.

Duties

1. Work with the departmental academic staff to develop and implement appropriate research

activities such as organizing departmental research seminars.

2. Provide assistance in students dissertation by developing the appropriate research activities such as collation of students' research topics, constituting a committee to assign supervisors, organizing presentations for defense of proposals and completed thesis, among others.

3. Implement best practice in managing the departmental research programs.

4. Develop and maintain records of research funding opportunities both locally and globally, particularly in the field of business and make such available to faculty.

5. Work closely with the FRO and RCC to provide an integrated approach to supporting the academic and research community of UPSA.

6. Take part in any other relevant task assigned by the HOD and Director of RCC.

2.4 Students' Research

It is the expectation of UPSA that students should not only be direct consumers of knowledge but also, must participate in knowledge creation through students'

research projects. Regardless of the degree being pursued by a student of UPSA, the research conducted by students contributes significantly to the research profile of the University. Students' research projects also contribute to the University's objectives of creating, synthesizing, and disseminating knowledge. One-way undergraduates and graduate students engage in research at the University shall be to work closely with their faculty supervisors.

2.4.1 Student Research Week

Student leadership at both the undergraduate and graduate levels shall work in collaboration with the RCC, Faculties and Departments to organize a student research week annually. The research week, christened Professional Research Bazaar, shall provide the opportunity for undergraduate and graduate students to showcase their research through posters and other media. The week will also introduce students to a wide range of research opportunities both within and outside the university. Faculties, departments, schools, centers, and students are expected to participate in this week-long activity. The week will be opened to the general public, especially students and faculty from other universities. A coordinating office must be setup

to liaise with both the Faculty, Department research Officers and the students to see to the orderly arrangement and organisation of this program.

2.4.2   Research at the Undergraduate Level

The Undergraduate Research must be a project undertaken by undergraduate students in their fields of study providing them an opportunity to participate in research and scholarly activity at UPSA, in line with their career and educational goals.

In line with the teaching sessions at UPSA, undergraduate research activities may be undertaken as follows:

- Dissertation to be written and presented by Regular students as defined in the Students Handbook.
- Evening and Weekend students have the option to undertake Business Case study or Dissertation. Guidelines on Business Case study are readily available at the faculties for reference by both students and staff.

  While the specific areas of research vary immensely in the faculties and schools, there are however, some traits that are common to undergraduate research in general.

2.4.3 Research at the Graduate Level

Taught Postgraduate Degrees

Taught postgraduate Research shall be a research paper or a project report carried out by students in their respective areas of study, which will provide them the opportunity to contribute to research and innovation at UPSA.

Other requirements shall be as specified in the respective faculties.

Research Degrees

Students undertaking Research Degrees will write a thesis as part of the requirement for the award of their degrees. The thesis may take the form of a monograph or a composite/publication.

Other requirements shall be as specified in the respective faculties.

2.5 Students' Research Supervision

Students are matched to faculty supervisors based on the interest of both students and the supervisors. The student-supervisor relationship is also to build student confidence, offer encouragement when necessary, and provide guidance and assistance for future education

and career development. Supervisors are required to meet regularly (not less than twice a month) with their students to undertake research plans, assess risks associated with the proposed research, and review results. Students are encouraged to take primary responsibility for their research project and to make substantial input into its direction.

2.5.1 Undergraduate Supervision

It is the responsibility of the departments to ensure that students at all levels are assigned supervisors when writing a dissertation or a research project.   In identifying supervisors, the DRO will constitute a committee that will match students' interest with that of the Faculty. The committee shall also consider, among others, the experience and workload of Faculty in assigning students.   The maximum number of students or groups of students as the as the case may be for a single supervisor should be five (5). The HODs based on recommendations from the DROs and the committees shall appoint undergraduate supervisors. The departments shall report to the RCC all appointed supervisors. HODs, DROs and the committees shall ensure that students and supervisors appointed are not in conflict of interest.

It is possible to change supervisors for students when the need arises. For instance, if the direction of the research changes, the supervisor can be changed by mutual consent of the parties involved. Supervisors cannot resign without the department's approval. Students must note that a change in supervisor is at the discretion of the department. Students, who feel they are receiving unsatisfactory supervision, should consult their respective DROs. If this avenue is not sufficient, the student is encouraged to speak with the appropriate HOD, Dean or the Director of RCC.

2.5.2 Postgraduate Supervision

All postgraduate supervisors shall be appointed by the departments in collaboration with the Director of RCC and the Board of graduate school. It must be ensured that students and supervisors appointed are not in conflict of interest. The maximum supervision load at the postgraduate level should be as follows:

Taught Masters	–	Five (5)
Research Masters	–	Two (2)
Doctoral	-	Two (2)

While supervisors at MPhil and MSc. levels can be appointed in the course of the programs, at the PhD

level, at least one supervisor shall be appointed before a student is admitted. All supervisors at the postgraduate level must hold a minimum of PhD

Where more than one Supervisor is appointed for a student, one shall be designated Principal Supervisor and the other(s) shall be designated Co-Supervisor(s). A person not on the staff of the UPSA but fully qualified, may also be appointed a Co-Supervisor but may not be Principal Supervisor, except where approved by the Board for Graduate School.

In cases of co-supervision of research, which involves disciplines in more than one Department, the Principal Supervisor shall be from the Department in which the student is registered, unless the supervisory Committee in any particular case decides otherwise.

The Principal Supervisor, or sole supervisor as the case may be, shall communicate regularly with the student and Co-Supervisor(s) and if applicable, convene meetings.

Students are required to submit bi-annual progress reports to the graduate school when approved by the principal supervisor.

It is possible to change supervisors for students when the need arises. For instance, if the direction of the research changes, a supervisor can be changed by mutual consent

of the parties involved. Supervisors can resign but with prior approval from the HOD. Students can request for a change of supervisor (s) as and when necessary. For a detailed description of supervision at the postgraduate level, refer to the UPSA Graduate Research Guide for Students and Supervisors.

2.6 Students' Research Assessment

Assessment of students' research will vary according to the levels of study.

2.6.1 Assessment of Diploma Research

Assessments of research at the diploma level are intended to evaluate how students can undertake basic research in their field of study. Supervisors shall take responsibility for grading final project report of the students they supervised according the grading policy of the University.

2.6.2 Assessment of Bachelor Research

The assessment shall be carried out in three phases at this level.

1. Proposal defense; a panel shall be constituted by the department in consultation with the RCC to evaluate students' proposal. This exercise shall

constitute 15% of the total marks for the students' dissertation.

2. Final thesis assessment; the final work of students shall be submitted to internal or external assessment. This assessment shall constitute (60) percent of total marks using the existing assessment criteria of the university.

3. The final phase; this will involve an oral presentation of the dissertation. A panel shall be constituted by the department in collaboration with RCC to evaluate the oral presentation of the dissertation. Students must incorporate comments emanating from the panel evaluation into the final work to be submitted to the department.

2.6.3   Assessment Postgraduate Taught Degrees

The supervisor shall assess all students' research projects undertaken here. Supervisors should award marks using the   existing assessment criteria of the university.

The postgraduate research degree assessment shall be carried out in three phases at this level.

1. Students shall make an oral presentation of the thesis proposal. A panel shall be constituted by the graduate school in collaboration with RCC to evaluate the proposal.

2. Final thesis submitted to the Graduate school shall be graded by an external assessor. Students must incorporate comments emanating from the external assessor into the final work before submission for oral presentation.

3. The final phase will involve an oral presentation of the thesis. A panel shall be constituted by the graduate school in collaboration with RCC to evaluate the final thesis.

2.7   Collaborative Research

Collaborative research at UPSA is aimed at enhancing the quality of research through exposure to new perspectives. Collaboration is a mutually beneficial and well-defined relationship entered into by two or more researchers or organizations to achieve common goals. Collaborators can provide data and/or participate in the research process.

UPSA collaborative relationship includes a commitment to:

- A definition of mutual relationships and goals
- A jointly developed structure and shared responsibility
- Mutual authority and accountability for success
- Sharing resources and rewards
-

2.7.1 Nature of Collaborative Research

Research collaboration in UPSA can take many forms, including but not limited to the following:

- a team of institutions or researchers
- mechanisms to support networks of institutions or researchers
- research programs that include a research training component
- targeted research
- institution building
- informal research partnerships

The following should be considered when undertaking a collaborative research:

- There shall be a clear-cut role for each partner at various stages of the collaboration.
- There must be common principles, beliefs and values upon which the partnership should be undertaken.
- There shall be a clear explanation of collective and specific objective of the collaboration.
- There shall be a clear definition of resources and deliverables for each partner.
- There shall be an establishment of effective project management systems.
- There shall be a contractual agreement or memoranda of understanding.
- The shall be an establishment of an

- effective communication system.
- There shall be contingency measures in place.
- There shall be a guideline for managing conflicts of interest for partners.

- There shall be an establishment of criteria for authorship among collaborators beforehand so everyone involved will know what to expect.
- There shall be guidelines that govern data ownership of funding agencies and those of the participation institutions used to support the research.
- There shall be an intellectual property ownership in reference to section 9 of this manual.
- There shall be an accountability and transparency that will serve as a guiding principle among partners in relation to all resources made available for the project.

2.7.2   **Responsibilities of Collaborating Researchers**
Researchers must disclose as soon as possible any actual, apparent or perceived conflict of interest to any aspect of the projects when establishing research collaboration. They must also comply with all multi-institutional practices.
- The Principal Investigator (PI) is responsible for the overall management of the project.

- The PI designs, executes and reports findings from the project.
- The PI is responsible for financial management of the research project.
- The PI is also responsible for protecting the integrity of the collaborative relationships of Investigator(s), Co-Investigators and shall work directly in collaboration with the PI to meet the project objectives.

2.8   Consultancy and other Research-related Activities

As a higher education provider, the University recognizes that one sure way of achieving its commitment to knowledge production and the application of its expertise for the benefit of businesses, industry, society, country and the world at large is through the provision of consultancy services. As such, the University encourages its staff to undertake

consultancy wherever appropriate and, in a manner, that is not inconsistent with their contractual responsibilities. The University's policy on consultancy can be found at (http://upsa.edu.gh/index.php/2017-01-29-11-12-36/consultancy-policy)

The Policy sets out the framework, detailing the principles and procedures, for undertaking consultancy by staff members of the University.

SECTION 3:

RESEARCH SUPPORT SYSTEMS AND STRUCTURES

3.1   Overview of Research Support System

The UPSA Research Support Systems and Structures is designed to provide a systematic framework for the governance and conduct of research as well as to promote the positioning of research as a priority pursuit of the University (See figure 1). The Research support system and structures enable the delivery of high quality research as a major activity at UPSA.

Figure 1: University Research Structure

```
┌──────────────────────┐
│  UNIVERSITY          │
│  RESEARCH BOARD      │
└──────────────────────┘
          │
          ▼
┌──────────────────────┐
│  RESEARCH &          │
│  CONSULTANCY         │
│  CENTRE              │
└──────────────────────┘
          │
          ▼
┌──────────────────────┐
│  RESEARCH            │
│  COMMITTEES          │
└──────────────────────┘
```
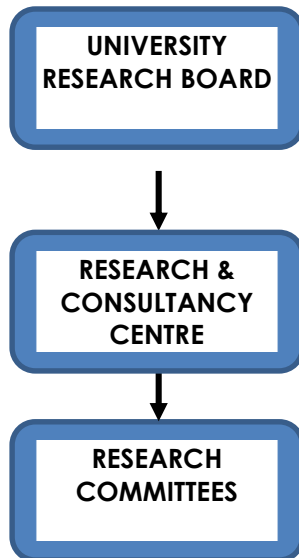
3.1.1 University Research Board

The University Research Board (URB) is the highest research policy-making unit of the University, established to create and ensure a vibrant research environment and culture. It has the following functions:

- Formulates, shapes and reviews university-wide research policy
- Positions and evaluates the research culture to achieve visibility both nationally and internationally
- Ratifies the decisions of research committees
- Appoints research officers in consultation with Departments, Faculties and RCC
- Allocates available resources for research and research related activities

The membership of the URB shall be composed of:

- Vice- Chancellor (Chair)
- Pro-Vice Chancellor
- RCC Director
- All Deans & Other Centre Directors
- External Research Collaborator
- All Research Committee Chairs

The Board should meet at least twice a year

3.1.2 Research and Consultancy Centre

The Research and Consultancy Centre (RCC) is a strategic directorate within UPSA responsible for the promotion, administration and oversight of all research, scholarly and consultancy activities. With this mandate, the Centre spearheads all research activities in terms of planning, policy formulation and implementation in the University. The RCC has the following core functions:

- Develops and maintains an enabling environment that encourages and supports the research goals of the University.
- Engages the university community, industry, government and other stakeholders (both nationally and internationally) in research that benefits society.
- Provides research support to both faculty and students, especially in the areas of publication and research capacity development.
- Implements policy directives issued by the URB.
- Oversees all faculty applications for research funding as well as the implementation of all research projects in the University.

In the exercise of its mandate, the RCC carries out its functions under the following six units:

- Institutional Research and Decision Support Unit
- Research Projects Unit
- Consultancy Unit
- Academic Publications Unit
- Research Compliance Unit
- Marketing and Business Promotion Unit

Institutional Research and Decision Support Unit

The Institutional Research and Decision Support Unit (IRDSU) will be responsible for the provision of institutional-level information for internal and external audiences.

Internally, it will work with departments of the University to collect, maintain and preserve institutional data for benchmarking and comparative studies. Externally, it will coordinate the reporting of institutional data to external agencies.

There shall be an Institutional Research and Decision Support Unit (IRDSU) coordinator preferably with the rank of a Research Fellow whose tenure of office shall be for three years; renewable subject to performance.

Research Projects Unit

The Research Projects Unit (RPU) will be responsible for identifying, collaborating and applying for research funding. It will also be the coordinating unit for all research projects of the University. As part of its functions, the RPU supports the processing of funded research applications of all faculties.

There shall be a Research Projects Unit (RPU) coordinator preferably with the rank of a Research Fellow whose tenure of office shall be for three years; renewable subject to performance.

Consultancy Unit

In UPSA, consulting is not viewed as research, but a professional service where expertise or advisory service is provided for a fee or in-kind benefit. Albeit short-term in nature, consultancies may lead to long-term collaborations and relationships with Government, Private Sector and Civil Society.

The Unit will co-ordinate and support staff, departmental and faculty consultancies as well as

develop policies to guide all consultancy activities in the University.

There shall be a Consultancy Unit (CU) coordinator preferably with the rank of a Research Fellow whose tenure of office shall be for three years; renewable subject to performance.

Academic Publications Unit

The Academic Publication Unit (APU) will be responsible for managing the publication process of all academic publications by the University especially the Journal of Business Research (JBR) and any other scholarly publication that may be introduced by the University. The APU will provide editorial support for faculty and students as well as aid in the selection of recommended journals for publication. The unit will also organize, coordinate and advertise academic conferences for the University.

There shall be an Academic Publication Unit (APU) coordinator preferably with the rank of a Research Fellow whose tenure of office shall be for three years; renewable subject to performance.

Research Compliance Unit

The Research Compliance Unit (RCU) will be responsible for quality assurance in research. The RCU will provide support and training to staff and students on issues of ethical and responsible conduct of research. The unit will

also have the mandate of ensuring compliance with national regulatory requirements and the University's research and consultancy policies. The unit will also guard against plagiarism and protect intellectual property.

There shall be a Research Compliance Unit (RCU) coordinator preferably with the rank of a Research Fellow whose tenure of office shall be for three years; renewable subject to performance.

Marketing and Business Promotion Unit

The Marketing and Business Promotion Unit (MBPU) will project the capability profile of the RCC and its activities to the general public. The MBPU will also serve as a liaison between RCC and its external stakeholders.

There shall be a Marketing and Business Promotion Unit (MBPU) coordinator preferably with the rank of a Research Fellow whose tenure of office shall be for three years; renewable subject to performance.

3.1.3 Research Committees

Faculty Research Committee

The Faculty Research Committee (FRC) shall coordinate all research activities within the faculty. The committee shall harmonize and ensure that all faculties are inter-connected research-wise. The functions of this committee

shall include:

- Developing the Faculty's Research Strategy on behalf of the Faculty Management Committee.
- Organizing and implementing inter-faculty research seminars or colloquiums and monitoring the Faculty's research performance.
- Coordinating Faculty research activities such as workshops and seminars.
- Coordinating and prioritizing collaborative bids within the Faculty.
- Developing strategies for the marketing of the research capabilities of the Faculty.
- Initiating and promoting inter-Departmental and inter-Faculty research collaboration.

The membership of this Committee shall comprise:

1. Vice Dean of Faculty (Chair)
2. Faculty Research Officer

3. Departmental Research Officers
4. Two representatives from RCC
5. At least one experienced faculty member

The Committee shall meet at least twice in a year and may hold emergency meetings.

Departmental Research Committees

The Departmental Research Committee (DRC) will be primarily responsible for maintaining an overview of research carried out in the Department by staff, students, visiting scholars and consultants, and for supporting the implementation and monitoring of the Departmental Research by drawing support from the relevant Faculty Research Officers and committees. The relevant functions of the DRC include:

- Developing and regularly reviewing the Research policy of the Department.
- Ensuring that the departmental research policy agrees with the University Research Policy.
- Developing and maintaining a Departmental research funding policy.
- Supporting a regular research seminar series by advocating and encouraging attendance.
- Promoting the development of national and international links and collaborations, with both academic and non-academic organizations.
- Maintaining good channels of communication with the DRC and RCC.

The membership of this Committee shall comprise:

1. Departmental Research Officer (Chair)
2. Faculty Research Officer
3. Two representatives from RCC
4. At least one experienced departmental member

The Committee shall meet at least twice a semester and may hold emergency meetings when necessary.

Research Publication Committee

The Research Publications Committee (RPC) will work closely with and through the Academic Publications Unit (APU) of the RCC. The functions of the RPC committee shall include:

- Coordinating the publication activities of the University journal
- Coordinating the publication of the University Annual Research Review (ARR)
- Coordinating the publication of any other research or scholarly publication that may be introduced by the University.
- Providing information and other support to faculty towards journal publications.

Membership of the Committee shall comprise:

1. Head of the Academic Publication Unit of RCC(Chair)
2. Senior Lecturer/Professor from RCC
3. Faculty Research Officers
4. representative from the Public Affairs directorate
5. representative from procurement

The Committee shall meet once every quarter and may hold emergency meetings.

Research Ethics Committee

The Research Ethics Committee (REC) works closely with and through the Research Compliance Unit of RCC. The functions of the REC committee include:

- Building and ensuring an ethical research community
- Granting ethical approval for Staff and Students' research projects
- Ensuring research integrity on the conventional lines of: plagiarism, copyright, fabrication of data, harmful effects on research subjects

Membership of the Committee is composed as follows:

1. Director of RCC (Chair)
2. Coordinator of the Research Compliance Unit of RCC
3. At least two members from the RCC
4. Faculty Research Officers
5. Departmental Research Officers
6. Relevant External Stakeholder if need be

The Committee will meet once a month.

Undergraduate Supervisory Committee

The Undergraduate Supervisory Committee (USC) shall work closely with the RCC in constituting supervisors for qualified students. The functions of the USC

include:

1. acting as a support system for both students and supervisors
2. allocating supervisors for students
3. assisting with progress tracking and research project development
4. helping with problem solving in the supervisory relationship

5. developing important supervisory skills, including communication with undergraduate students and evaluation of student work

The membership of the committee is composed as follows:

1. Deputy Director RCC (Chair)
2. Departmental Research Officers
3. One Supervisor representative from each Faculty

The Committee shall meet once every semester.

Postgraduate Supervisory Committee

The Postgraduate Supervisory Committee (PSC) shall work closely with the RCC and the Graduate Board in constituting supervisors for qualified students.

The functions of the PSC committee include:

a. providing support to students and supervisors
b. broadening and deepening the range of expertise
c. advising, defining the program of study
d. offering advice about, and assessment of, students project work

e. monitoring the progress of the graduate student

A Master's supervisory membership committee is composed as follows:
- Deputy Director RCC (Chair)
- Graduate program coordinators
- Principal Supervisor (s)
- One Faculty member from outside the student's degree and the supervisor's program/discipline area

A Doctoral supervisory membership committee is composed as follows:
- Dean of Graduate school (Chair)
- Director of RCC
- Graduate program coordinators
- Principal Supervisor(s)
- One Faculty member of the committee must be from outside the programme in which the candidate's research is carried out.

The Supervisory Committee should meet at least twice every semester.

Inter-Faculty Research Committee (IFRC)

The Inter-Faculty Research Committee (IFRC) essentially coordinates all research activities amongst the various faculties and Centers at UPSA. The committee harmonizes and ensures that all the faculties and Centers are inter-connected research-wise. The functions of the PSC committee include:

- Developing and evaluating on an on-going basis, a college-wide program for student course evaluations.

- Recommending programs to improve teaching, research or service effectiveness

- Recommending revisions in the annual faculty performance evaluation review process to improve faculty performance through planning, development and evaluation.

- Monitoring the functions of Research Committees in the University.

- Organizing inter-faculty students research Professional Bazaar.

- Identifying of supervisors; and coordination of academic supervision.

The membership of the Committee is composed as follows:

1. Director of RCC (Chair)
2. Coordinator of RCU
3. Faculty Research Officers
4. Departmental Research Officers
5. One representative from each Centers

The Committee meets twice in a semester and may hold emergency meetings.

SECTION 4:

GRANTS AND RESEARCH FUNDING

4.1   Introduction

This section takes a look at grants and research funding activities generally within the University. UPSA has a strong commitment to pursuing research relationships with external sponsors. Guided by the mandate and key principles that established the University, UPSA is focused on conducting research that inure to the benefit of individual researchers, sponsors, the University and the public at large. Specifically, this section focuses on the principles guiding sponsored projects and various sources of research funding.

4.2   Principles of Project Support

In the conduct of research activities, UPSA is committed to entering into industry or externally funded agreements that embody the following principles:

4.2.1 Reasonableness

The nature of expenditure and the amount of money involved in the conduct of research should be prudent under the circumstance(s) surrounding the research. The research should also reflect fairly the economic realities of

conducting cutting-edge research with modern accessories.

4.2.2 Allocability

The research expenditure should provide direct benefit to the project. This implies that the cost of a piece of equipment, for instance, that is required to accomplish the conduct of two research projects may be proportionately shared by the two projects.

4.2.3 Consistency

Costs incurred for the same purpose in similar circumstances should be treated consistently as direct costs across the University. Also, sponsored research relationships will be negotiated in an open, fair and transparent manner consistent with UPSA policies and good commercial practice.

4.2.4 Allowability

Research process must conform to any limitations or exclusions as set forth in the mandate, principles, quality manual, Research Policy document among other accepted documents of UPSA.

4.3   Sources of Research Funding

Research funding sources at UPSA is categorized under four main themes. The categorization includes self-funding, university funding, government and external sources of funding.

4.3.1 Self

Self-funded sources shall constitute research projects or activities that are funded at the faculty levels, using faculties' own source of funds. Examples of such projects will be projects that are funded by individual faculty members.

4.3.2 University

University funded sources shall include research funding that comes internally from UPSA management for the conduct of research that goes mainly to the benefit of the public and the University.

4.3.3   Government

Government departments and agencies, particularly provide funding for research in many universities in Ghana. In most instances, government funding comes through solicited processes where proposals are requested and institutions including universities are

requested to respond to these calls. UPSA shall continue to participate in the process for funding from government to conduct cutting-edge research that goes to the benefit of government and the public at large.

4.3.4   External organizations

UPSA strongly encourages partnership between faculty researchers and their counterparts in industry. In furtherance, UPSA shall strive to ensure adherence to the following in partnership arrangements with industry for the conduct of research:

- Freedom of choice in the selection of research topics in conduct of the research.

- Clear ownership of intellectual property including patents, management or elimination of conflicts of interest (see section 9).

- Freedom of dissemination of research findings, especially with communities and other stakeholders.

- Research conducted under industry-university collaborative arrangement shall be conducted with relevance to the educational mission of the University.

Funding from external agencies such as UN, other developmental and civil society organizations play a crucial role in promoting research in many universities across the globe. UPSA encourages collaboration and active engagement with external funding agencies for the conduct of research. Funding from such sources has been pivotal in many research activities within the University. Modalities for engaging with external organizations for research funding shall be driven by the requirements of the funding organizations, the UPSA mandate and principles underlying the conduct of research as specified in section 2 and UPSA policy manual.

SECTION 5:

PROPOSAL DEVELOPMENT, SUBMISSION AND NOTIFICATION

5.1 Introduction

This section details the various processes involved in proposal development, submission, approval and post-award activities.

5.2 Types of Proposals

Six different types of proposals are often identified. These include pre-proposal, solicited proposal, renewal and continuation proposals, consortium/joint proposals and sub-contracts, limited solicitations, and revised budgets.

5.2.1 Solicited Proposal

Sponsors solicit formal proposals by publishing specific program announcements. These solicitations are often referred to as Request for Proposals (RFPs), Funding Opportunity Announcements (FOAs), and Broad Agency Announcements (BAAs) among others. Researchers responding to the program announcement write the proposal to meet the sponsor's program guidelines. Deadlines may recur annually or several times a year. However, most solicited proposals have stated deadlines

and are one-time solicitations for specific needs of the sponsor(s).

Solicited proposals shall be submitted to sponsors using the proposal submission process of the University as seen in section 5.8.

5.2.2 Renewal and Continuation Proposals

When researchers request for the continuation of a project for which the funding or project period is about to end it is referred to as renewal or continuation proposal. Such proposals are similar to "new" proposals and must be submitted and approved using the proposal submission process of the University as seen in section 5.7.

5.2.3 Consortium/Joint Proposals and Sub-Contracts

These are submitted for projects that will involve investigators from more than one institution. In general, one institution will be designated as the lead at the time of the proposal submission. The lead institution accepts full funding and responsibility for the performance of the project from the sponsor. Sub-award agreements are then negotiated to transfer part of the work and appropriate funds to the other participating institutions. Generally, all conditions imposed by the sponsor on the lead institution

are also imposed on the subcontractor(s). All subcontracts, both to and from UPSA, shall be negotiated by the RCC. When UPSA is the lead institution, the RCC requires a statement from each participating organization that includes a budget and work scope, signed by an authorized institutional official. When UPSA is the subcontractor, the information (scope of work, budget, etc.) sent to the lead organization shall be processed by the RCC.

5.2.4 Limited Solicitations

Occasionally, sponsors announce program funding opportunities, limiting the number of proposals that may be submitted by each institution or applicant. When such announcements are made to the University, the RCC shall distribute the program applications to the appropriate deans and center directors, who, in turn, distribute to the appropriate faculty, depending on the subject matter of the program. Faculty interested in submitting proposals must send a one-page description of the proposed project and copy of their curriculum vitae to their Dean. The major criterion for selecting proposals is the relevance to the program selection criteria and the potential for successfully competing in

the sponsor's competitive process. Faculty whose pre-proposals survive the institutional pre-competition will prepare a complete application to submit to the sponsor.

5.2.5 Revised Budgets

When a sponsor wants to fund a proposed project at an amount different from that originally proposed, the sponsor asks the Researchers to submit a "revised" budget supporting the amount to be funded. A revised budget must be submitted through the University proposal routing process to document the signatories' approval of the budget revisions. If the researchers and the sponsor redefine the scope, budget and objectives of the project, it shall be communicated in writing before the University accepts the award.

5.3 Initial Contact with the Sponsor

The approach a researcher takes in contacting potential sponsors will be contingent on the administrative area to which one reports and the type of sponsor from which the researcher is seeking funding. The RCC will maintain listings of current program officers and other representatives of government funding agencies, plus information about specific initial contact requirements or guidelines. Programme officers are usually good

initial point of contact for faculty wishing to discuss the scope of their project and guidelines unique to the agency.

A key element of successful proposal writing is establishing an early relationship with your potential funding source. Specifically, the purpose of the initial contact is to confirm the common areas of interest of the sponsor and the researcher. These inquiries can take the form of phone conversations or written correspondence in the form of a letter of inquiry. A letter of inquiry is initiated by an applicant to determine if a proposed project is within an agency's fundable program area and to request agency policy and program information, as well as instructions and forms. One should always address a letter of inquiry to a specific person. Inquiries should address the following basic questions:

- What do you intend to do?
- Why do you want to do it?
- How will you do it?
- What do you estimate the project will cost?
- When and where will you do it?
- Who are you and what are your qualifications?

- Who will benefit from this work?

5.4   Proposal Preparation

All sponsored research agreements must be evidenced by a formal written document that outlines the research objectives and administrative requirements of the project. Informal (oral) agreements are the personal responsibility of the individual faculty member making such arrangements and are not binding on the University.

The creation of a proposal for a potential sponsor for support of research or other scholarly activity is the responsibility of the principal investigator or project director. Proposals are normally submitted through the submission process of the University.

Some key Sponsored Project polices to consider in preparing sponsored project proposals include the following:

- Cost-sharing on Sponsored Projects
- Effort Commitment
- Charging of Administrative or Clerical Salaries
- Charging of Facilities and Administrative Type Expenses to Non-Central Government Sponsored Projects etc.

5.5   Components of a Proposal

Whether submitted in paper or electronic form, proposals should contain all or some of the following information:

- Title Page includes the title of the project, amount requested, information of the Project Director , the contact of authorized institution (in most cases, the RCC through the University) and date. In addition, it might include the name of sponsor, title of program or solicitation number, and place for appropriate signatures if not included elsewhere.

- Executive Summary should describe the aim, methodology, and significance of the proposed project. The executive summary should be clear to someone who is not an expert in the field.

- Introduction frames the background, problem, objective(s) and concisely states the importance of the research or scholarly activity that is being proposed.

- **Literature review**

  Literature reviews should be selective and critical, not exhaustive. There should be an evaluation of pertinent works to support the stated problem as much as possible.

- **Project narrative**

  The project narrative should clearly and explicitly state the connections among the detailed statement of problem, research objectives, questions, methodologies, and deliverables as well as evaluation and dissemination of the research.

- **Personnel**

  Staffing requirements should be explained in detail and the staffing should be relevant to the project. The personnel must have explicit knowledge, skill sets, abilities and preferred attitudes of the personnel already in place. (include their Curriculum Vitae as part of the proposal).

- **Budget**

  The budget should spell out project expenditure which shall consists of a

spreadsheet or table with the budget detailed as line items and a budget narrative that explains the various expenses. The proposal should also include all budget items that meet the funding requirements of the agency.

- **Time Plan**

  Explain the time plan for the research project in detail. When would each step begin and complete? Present a visual version of your time plan in your proposal to help reviewers understand and evaluate the planning and feasibility.

- **Bibliography**

  This includes published material which helps frame the importance of the activity and helps the reader to understand the current stage of development of the research or the scholarship that has previously been developed.

- **CV/Biographical Sketch**

  This should be submitted in the format required by the sponsor.

- **Organizational Facilities and Resources**

  This describes the state-of-the-art equipment or other relevant resources including space, library resources, technology and core facilities that will be available to the project.

- **Letter of Support:**

  Other letters of support, if required, should be included in an appendix.

- **Transmittal Letter**

  It should be included if a form asking for an institutional signature is not provided or required by the sponsor. Unless otherwise indicated, these are prepared by the RCC.

5.6   Helpful Hints and Resources

Information is available at the RCC that may be helpful to Principal Investigators and Project Directors in preparing proposals, including templates for the most recent fringe benefits, graduate student tuition, and facility & administration rates. It is particularly important to adhere to agency format requirements, page limitations, and requirements for the inclusion of appendix materials, and

the format and content of the relevant publications the sponsor.

5.7   Required Review and Signatures

No application may be submitted to any external sponsor without the prior approval of the University. The signature of the institution's authorized official is necessary to indicate University compliance with sponsor and government regulations, acceptance of responsibility for the administration of the sponsored project—including the provision of adequate facilities and services—and for compliance with applicable University policies and procedures. Authorization may also represent pre-acceptance of the terms and conditions of an award unless exception is taken at the time of proposal submission.

5.8   Procedures for Proposal Submission

Proposals should be routed through the office of the Director of RCC. Five (5) working days should be allowed for review, correction (if needed), and transmittal prior to the deadline. All proposals submitted to the Research Centre for review and submission to a sponsor, regardless of method, must be accompanied by the Research Centre's Proposal Summary Form and any other necessary internal paperwork. This form must be signed by the

Principal Investigator or Project Director and his chair/school dean as well as any additional Co- Project Directors and their chairs/deans.

5.9 Pre-Award Audit

Some sponsors may require additional proof or supporting materials to document a proposed budget prior to award. Project Directors should maintain a file of all supporting materials used in the development of a project budget. Examples of items that should be retained include copies of all price quotes for equipment, all documentations including travel costs, etc.

A sponsor may wish to support a proposed project at a reduced level of funding. If requested, a revised budget should be submitted to the RCC for review and submission. Unless the revision imposes additional cost-sharing or space requirements, or significantly affects the proposed Facility and Administrative recovery, there is no need to submit the proposal through the same approval channels as the original proposal. Reductions in proposed budgets should be evaluated to determine whether there is a change in the Project Director's level of effort or to the scope of work. Project Directors should not negotiate directly with external sponsors, and if contacted directly

by a sponsor regarding the terms of an award under discussion, they should refer the sponsor to the RCC.

5.10   Proposal and Award Tracking

It is standard practice of RCC to keep a proposal in pending status in the research database for a maximum of 6 months following its submission. During tracking, the status would be changed from "Pending" to "Awarded" if granted, or to "Declined" if an award was not granted to the university, or to "Pending- Work in Progress (WIP)" if it is believed the funding may come but there is some justifying delay relative to the time plan of its occurrence. The "Pending-WIP" eventually changes to "Awarded" or "Declined" based on the outcome of the proposal.

Status of a proposal is obtained in two ways:

1. Notice directly from the sponsor or Principal Investigator

2. Auto-emails requesting a status update from the Principal Investigator

5.11   Award Announcements

UPSA requires that all proposal submissions through the RCC when successful should notify the RCC again for onward announcement to the university community. Important points to be considered in a notice of award are the following:

- Project Duration: The period to implement the project must be outlined clearly.
- Name of Key Personnel: The principal and co-investigators who would be responsible for conducting the project should be mentioned.
- Project Sponsor and Amount: The sponsor(s) and the total project amount must also be communicated. If the sponsor requires the University to contribute its own resources to the project, this must be clearly indicated.

5.12   Protection of Confidential Information

Proposals may contain sensitive information, including both personal and scientific materials that the Principal Investigator or Project Director may not wish to have distributed publicly. Where the Principal and co-investigator deems it necessary not to make some

portions of the proposal public, they should notify the
RCC.

SECTION 6:

POST-AWARD ADMINISTRATION AND CONTRACT

6.1 Introduction

The content of this section is relevant to individuals or parties who are involved in post-award administration. As noted in section five, contracts on sponsored projects are legally and mutually binding agreements between the sponsoring agency and the University. Failure to comply with the terms and conditions of the contract may require the University to refund the monies awarded, pay penalties or fines, which in turn may jeopardize the University's prospects of qualifying for future awards.

While the responsibility for compliance begins before the awards, it is a process that continues throughout the duration of a project.

6.2 Responsibility

Post-award administration at UPSA would often be a joint responsibility among several parties. The parties include but not to the following:

- o Anyone who authorizes the expenditure of sponsored project funds.
- o Anyone who manages sponsored project funds.

- o   All members of the research team.
- o   Sponsored project accountant and other staff from the Finance Directorate.
- o   Staff from the RCC and Faculties associated with the project.

6.3   Types of Awards

Project awards at UPSA shall take different forms, including gifts, sponsored projects and grants. For accounting purposes, it is important to review the funding agency's regulation and award agreement to obtain specific information about the type of award and its administration.

6.3.1 Gift

A gift shall be considered as any item of value given to UPSA by donor(s) in return for which the donor(s) does not expect anything of significant value but a recognition and disposition of the gift in accordance with the wish(es) of the donor(s). Examples of gifts shall include but not limited to endowments, program supports, and scholarships.

The qualifying attributes of a gift are that:

- It is not recoverable;
- It is not an exchange for favor; and
- It has no deliverable obligations to the donor.

6.3.2 Sponsored Project

A sponsored project shall be considered as either an internally or externally funded activity from a sponsor in which a formal written agreement is entered into by the University and the sponsor. The following shall be the attributes that define a sponsored project;

- A clearly defined scope of work and timelines.
- Expected output(s) or specific deliverable(s).
- The award contains intellectual property rights provisions.
- The award restricts or monitors publications or use of results.
- The award requires protection of confidential information relating to either the University and the sponsor(s).
- Award payments are contingent upon programmatic or fiscal reporting.
- The proposal and/or award includes detailed, itemized budget.

- At the completion of the project, the sponsor requires the return of unexpended funds.

6.3.3 Grants

A grant shall be considered as a pledge of support in which the sponsor has little involvement in conducting the project. Grant proposals shall be submitted according to agreed guidelines. Examples may include Request for Applications (RFA), Expressions of Interests (EOI) or submission of Concept Notes. It is important to take note of the following interrelated concepts with regards to grants.

6.3.4 Cooperative Agreements

A cooperative agreement shall be a written agreement between the sponsor and the University prior to the commencement of the project. Usually, a cooperative agreement is initiated by the sponsor.

6.3.5 Contracts

A contract shall be a binding agreement between the sponsor and the University, where the sponsor shall be involved in the execution of the project and use the project to achieve a specific outcome or/of a deliverable

outcome.

6.3.6 Sub-contract or sub-grants

A grant or contract can be sub-awarded. A sub-award shall be a formal agreement made between the University and a Sub-recipient to perform a portion of the University's sponsored projects. A sub-award must include a clearly defined statement of work which should be performed by the sub-recipient.

6.4 Modification of a Sponsored Project

Each sponsored project award comes with a unique set of terms and conditions, which may range from entirely flexible to quite restrictive. The RCC shall be responsible for reviewing the award documents and, if need be, request for a modification. Changes that occur in the conduct of sponsored project require prior written approval from the sponsor. The level at which approval may be granted depends upon the type of award and the sponsor's specific policies governing the award.

6.5 Negotiations/Acceptance

Where necessary, it may be imperative for the RCC to negotiate the terms and conditions attached to an award. The goals in negotiation are to protect the investigator's

publication and intellectual property rights; to protect the institution against harmful or unmanageable stipulations; and to ensure any agreement is in synch with state and national regulations as well as University requirements.

6.6 Signature Authority

The authority to enter into contracts or sign agreements on behalf of the University is vested in the Vice-Chancellor. This contracting authority, to the extent that it borders on sponsored projects, is delegated to the Director of RCC on a limited basis. The contracting authority of the Director of RCC extends but not limited to the following agreements:

- Grant agreements
- Contracts
- Consortium agreements or subcontracts from other university sponsors
- Consulting agreements
- Cooperative agreements

- Industrial research agreements
- Non-disclosure agreements
- Confidential disclosure agreements
- Research contract

- Research teaming or collaboration agreements.

6.6   Account Set-Up

Once RCC receives, reviews, and approves all the necessary award paperwork and accepts an award on behalf of the University, it shall prepare the award authorization an account opening notice to the Finance Directorate for necessary action. From there, the Finance Directorate assigns a project-specific accountant, which shall be responsible for that project.

6.7   Pre-Award Cost

Pre-award costs are permissible under most grants and allow the institution to incur certain costs up to 90 days in advance of the actual award start date, or in advance of delayed receipt of an award. A request for approval of pre-award costs may be made by the Researchers or the department. In the event that the award is not forthcoming, the University will be responsible for any pre-award costs incurred. Requests for pre-award accounts should be directed to the RCC. Pre-award cost for contracts may not be institutionally approved; however, the contracting agency may authorize pre-

contract costs if negotiated by RCC and accepted by the agency

6.8   Post-Award Cost

Post-award costs are permissible under most grants and allow the institution to incur certain costs up to 90 days in advance of the actual award start date, or in advance of delayed receipt of an award. A request for approval of post-award costs may be made by the Researchers or the faculties involved through the RCC. In the event that the award is not forthcoming, the University will be responsible for any post award costs incurred. Post award cost for contracts may not be institutionally approved; however, the contracting agency may authorize post contract costs if negotiated by RCC and accepted by the agency.

6.9   Re-budgeting of Funds

In the course of the project, budget changes may become necessary. Sponsors may allow flexibility in project funds utilization and permit budget changes to meet project requirements. Researchers shall request prior approval for budget changes when necessary. Actions that may necessitate a change of budget may include but not limited to the following:

- A change in the target population.

- Applying new technology.

- Transferring the performance of substantive programmatic work to a third party.

- Absence or change of key personnel.

- Emergency and foreign travels.

Issuance of sub-contracts not included in an original proposal.

SECTION 7:

FINANCIAL MATTERS

7.1   Financial Management

Financial Management of a sponsored/funded research project is a collaborative process and collective responsibility of the Director of Research and Consultancy acting for or on behalf of the VC, Principal Investigator(s) and Project Finance Officer. The goal of financial management is to adhere to the financial administration regulations of the University, meet requirements of the sponsor(s) and avoid or minimize possible adverse of audit findings for the institution. Thus, it will be necessary for the Project Finance Officer to conduct monthly reviews of revenue and expenditures on each sponsored/funded research project to ensure that all expenditures are appropriate. Out of the monthly reviews, if errors or deviations are detected, they should be addressed within a reasonable time as may be stipulated in the financial administration regulations of the University.

7.2   Types of Sponsored Research Project Contract

For every sponsored research project, there shall be a contract or some form of agreement. The contract is expected to spell out a detailed terms of reference

governing timelines, performance milestones, releases of funds, and reporting. Basically, sponsored research project contracts may take different forms including:

- Advanced payment – these payments are made in advance either in total or in some agreed fixed sums at the beginning of the contract or at scheduled intervals.

- Invoice schedule payment – these payments are made upon receipt of invoice from the University. The invoice may be based on tasks completed or agreed timelines.

- Auto schedule payment – these payments are made based on agreed milestones which could be tied to a specific task to be completed or time-based. With this contract, the sponsor does not require an invoice from the University to make payments.

- Cost reimbursable – these payments are not made in advance but they are made after expenditures have actually been incurred and invoiced to the sponsor.

  Typically, contracts of this nature tend to require a Financial Status Report (FSR) at the close of the contract. If expenditures have not reached the budgeted values at the end

date of the project, the budget is underspent and the funder will not reimburse the full budget.

- Hybrid – the payment of this contract comprises a cost reimbursable part and a fixed fee component. The cost reimbursable portion is invoiced based on the contract items to be billed at cost while the fixed fee portion is invoiced based on the specific milestones prescribed in the contract.

7.3   Oversight responsibility

As the Chief Spending Officer, the VC retains the oversight responsibility on all financial matters relating to sponsored/funded research project. However, this responsibility may be delegated to the Director of Research and Consultancy.

7.4   Responsibilities of the Research Consultancy Centre

Per the statutes of the University, the RCC is mandated to oversee, promote and administer all research, scholarly and consultancy activities of the University. In this regard, the financial management responsibilities of the RCC include:

- Award set-up

- Monitoring and Evaluation
- Reporting
- Award close-out

7.4.1 Award set-up

On receipt of an award letter, the RCC shall review the terms and conditions to assess the implications on the University. If the terms and conditions are unacceptable, where possible, they will be re-negotiated to fall in line with University's preferred terms of trade with the funder before the University or its representative formally accepts the award or sign the contract on its behalf.

When a grant award is accepted, the RCC will work with the Finance Directorate to formally set up the award details in the accounting system. However, before the teams set up the award, they must be informed that all the appropriate ethics approvals have secured. Once the set-up process has been completed, the award and project numbers will be activated in the general ledger and the PI can spend against the project number. The RCC will send the PI information regarding:

- Award letter/funder's terms and conditions or contract
- Budget breakdown sheet
- Project Number

- Award Number
- Any specific requirements/obligations

7.4.2 Monitoring and Evaluation

The requirements of every sponsored research project vary. Therefore, it is advisable that the RCC continually monitors each award to ensure that the project is on course and to assure that expenditures are consistent with the budgets for each reporting period as well as other terms and conditions of the award. When reports are due and ready, the RCC in collaboration with the PI and PFO may conduct a final evaluation to ensure compliance.

7.4.3 Reporting

Usually, the reporting requirements of sponsors vary. Some require semi-annual, annual or one report at the end of the project period which could cover several years. Therefore, it is advisable that the PI and PFO continually monitor each award to ensure spending is consistent with the budgets for each reporting period as well as other terms and conditions of the award. The RCC may not be conducting any periodic review of an award as a standard practice but will mainly review an award at the time a report is due.

7.4.4 Award Close-Out

Award close-out marks the official end to a sponsored project. Close-out may be due to completion of the project or early termination.

Early termination

Where a PI suspects that a research agreement is at risk of early termination, it is important to inform the RCC immediately. The RCC will then review the contractual agreement and negotiate an amicable or preferred solution with the sponsor.

Closure due to Completion

After a project has successfully run its full course, it is natural that it will be brought to a closure. However, before the RCC can initiate project closure, it will have to confirm with the PI and Project Finance Officer (PFO) that:

- The PI has submitted the final scientific report on time.
- Final payment has been made.
- The PFO has cleared overspends, disallowed costs or surpluses and closed any open Purchase Orders.
   The applicable procedures for proper close-out are explained in Section 7.16.

7.5   Responsibilities of the Principal Investigator(s)

For every sponsored project, there must be a principal investigator (PI) or Co-Principal Investigator (Co-PI). The PI is the primary individual designated to be responsible for the preparation, conduct, and administration of the sponsored project in line with relevant applicable laws, regulations and institutional policies. The Co-PI is the pivotal person with similar responsibilities as the PI but in charge of mainly ensuring that the sponsored project is conducted in accordance with applicable laws, regulations and institutional policies.

The role of a PI or Co-PI on sponsored or externally funded research project is reserved for all full-time academic staff of the University or persons who hold Emeritus, Adjunct, Visiting, Post-doctoral, or other faculty positions in the University, and, who have the express approval of their Heads of Department/Unit and the relevant Deans/Directors.

While the Director of RCC may have delegated oversight responsibility, accountability for compliance with UPSA's policies and sponsor requirements are vested in the Principal Investigator (PI). In addition to ensuring that all regulatory requirements are met, the PI has fiscal responsibilities besides his/her responsibility for the

preparation of the technical proposal. The fiscal responsibilities include:

- Preparation or supervision of project budget and its justification
- Management of the project within funding limits and restrictions
- Adherence to reporting requirements

7.6 Responsibilities of the Project Finance Officer

There shall be a Project Finance Officer (PFO) from the Finance Directorate to be designated by the Director of Finance. The PFO shall perform the following responsibilities:

- Review award terms and set up account system.
- Update system with receipt and payment information.
- Ensure that only appropriate and allowable expenses are charged to the project account.
- Review expenditures and balance available with PI and submit quarterly report.
- Notify RCC when expenditures have been finalized and project is ready to close out.
- Prepare final report to RCC and sponsor.
- Determine deficit or residual balance.

- If deficit, inform RCC where deficit should be transferred.
- If residual balance exists, work with PI to determine if return to sponsor or allowed to transfer to unrestricted research fund.
- Obtain VC's approval for residual balances, if required.
- Submit close-out report to RCC within 30 days after contract termination date.

7.7   Budget

As part of the proposal submission, the PI is responsible for providing a complete financial picture of the proposed project (i.e. budget). The RCC must have a copy of the budget for the project file. In proposing budgets for sponsored projects, the PI assures UPSA and the potential sponsor that project finances are represented as accurately as possible. Cost estimates of individual line items should be carefully calculated so that the requested funds are adequate but not excessive. All costs included in the budget must be both allowable and allocable for the proposed research. These terms are defined as follows:

Allowable cost: A cost is allowable if it meets all of the following criteria:

- The cost is directly related to the Project.
- The cost is identifiable to the project purpose.
- The cost is reasonable.
- The cost is necessary.
- The cost is consistently treated.
- The cost is allocable.
- The cost is not specifically prohibited by the funding source or University.

Unallowable Costs are costs incurred which cannot be charged to a sponsored research projects, either as direct or indirect costs (e.g., advertising, bad debts, entertainment, lobbying, and more).

Allocable cost: A cost is allocable to a Project award if:

a) The goods or services involved are chargeable or assignable to a project award or cost objective in accordance with relative benefits received. This standard is met if the cost:

1. Is incurred specifically for the Project award;

2. Benefits both the Project award and "other work" and can be distributed in proportions that may be approximated using reasonable methods; and

3. Is necessary to the overall operation of the "other work" and is assignable in part to the Project award in accordance with the principles in this subpart.

b) All activities which benefit from the "other work's" indirect (F&A) cost, including unallowable activities and donated services, will receive an appropriate allocation of indirect costs.

c) Any cost allocable to a particular Project award under the principles provided for in this part may not be charged to other Project awards to overcome fund deficiencies, to avoid restrictions, or for other reasons.

d) A cost benefits two or more projects or activities in proportions that can be determined without undue effort or cost, the cost must be allocated to the projects based on the proportional benefit. Or, if a cost benefits two or more projects or activities in proportions that cannot be determined because of the interrelationship of the work involved, then, notwithstanding paragraph (c) of this section, the costs may be allocated or transferred to benefit projects on any reasonable documented basis.

e) In the event that the contract is subject to Cost Accounting Standards (CAS), costs must be allocated to the contract pursuant to the CAS. To the extent that CAS is applicable, the allocation of costs in accordance with CAS takes precedence over the allocation provisions in this part.

The RCC in collaboration with the Finance Directorate offers training on budget preparation and justifications. The table

below shows a sample budget, which includes information on the major expenditure categories as discussed in Section 7.8.

Financial Budget for Project UPSA_2018_

ORGANIZATION: UNIVERSITY OF PROFESSIONAL STUDIES, ACCRA				SPONSOR: National Research Fund (NRF)	
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR PI: Dr. Ibrahim Mohammed				Requested Duration: _____ (Months)	
A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title; A.6. show number in brackets)	NRF Funded Person-mos.			Funds Requested	Funds Granted
	Unit	Rate (US$)	Amount (US$)	by Applicant (US$)	by DOE (US$)
1. PI: Dr. Ibrahim Mohammed	0.00	0.00	0.00	0.00	
2. Co-PI: Mr. Timothy K. Avordeh	0.00	0.00	0.00	0.00	
3. Co-PI:	0.00	0.00	0.00	0.00	
4. Co-PI:	0.00	0.00	0.00	0.00	
5. Co-PI:	0.00	0.00	0.00	0.00	
6. ( ) Others (List individually on budget explanation page)					
( ) TOTAL SENIOR	0.00	0.50	0.00	0.00	

PERSONNEL (1-6)					
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. ( ) Post-Doctoral Associates				0.00	
2. ( ) Other Professional (Technician, Programmer, etc.)				0.00	
3. ( ) Graduate Students				0.00	
4. ( ) Undergraduate Students				0.00	
5. ( ) Secretarial – Clerical				0.00	
6. ( ) Other					
TOTAL SALARIES AND WAGES (A + B)				0.00	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				0.00	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				0.00	
D. PERMANENT EQUIPMENT (List item and dollar amount for each item.) Need description of equipment					
Total permanent equipment				0.00	
E. TRAVEL 1. Domestic				0.00	
2. Foreign				0.00	
TOTAL				0.00	

F. TRAINEE/PARTICIPANT COSTS		
1. STIPENDS (Itemize levels, types + totals on budget justification page)	0.00	
	0.00	
2. TUITION & FEES	0.00	
3. TRAINEE TRAVEL 4. OTHER (fully explain on justification page)	0.00	
TOTAL PARTICIPANTS (0) TOTAL COST	0.00	
G. OTHER DIRECT COSTS		
1. Materials and Supplies	0.00	
2. Publication Costs/Documentation/Dissemination		
3. Consultant Services	0.00	
4. Computer (Adpe) Services		
5. Subcontracts	0.00	
6. Other Tuition	0.00	
TOTAL OTHER DIRECT COSTS	0.00	
H. TOTAL DIRECT COSTS (A THROUGH G)	0.00	
I. INDIRECT COSTS (Specify rate and base) 49.7% $113,503 (rates change be sure to verify the current %) TOTAL INDIRECT COSTS	0.00	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)	0.0	

7.8   Key Elements of Budget

Although budget format and details may vary from one sponsor to another, the costs in a typical budget normally fall into the following two categories: Direct Costs and Indirect Costs (Facilities and Administrative costs) (F & A).

7.8.1 Direct Costs

These are costs that can be specifically identified or associated with the project or sponsored account. Personnel costs such as salaries and fringe benefits constitute the most significant part of direct costs for any sponsored project, but, direct costs may also include travel, printing, materials and supplies, subcontracting agreements, and more.

Personnel Costs - Salaries and Wages

- For all personnel serving in any paid capacity on the project, the salaries and wages should be calculated by indicating the amount time/days that they will spend on the project and the corresponding rate.
- Salaries of departmental administrative and clerical staff are considered Facilities and Administrative costs (indirect costs) and are not supposed to be charged to sponsored projects. However, if the sponsored agreement permits administrative and clerical staff salaries to be charged as direct cost, then it must be documented and described in the budget justification.

Personnel Costs - Fringe Benefits

- Fringe benefits cover expenses associated with salaries, such as insurance, retirement benefits, etc. These are direct costs associated with salaries and wages and must be shown separately in the budget of a sponsored project.

- It should be noted that full fringe benefit rates are applied to direct salary and wages of full-time employees and to part-time employees who work at least 50% time at UPSA.

- Students who are engaged on sponsored projects are not subject to fringe benefits.

  Student Participation – it is recognized that the participation of undergraduate and graduate students in research activities of a faculty members enriches students' education and offers them an introduction into academic careers. Therefore, in order to encourage both faculty and students to work on sponsored projects, students' participation is chargeable to sponsored project budget as direct cost using standard approved rates.

Equipment

Equipment to be included in the budget shall be capital in nature. A capital equipment is defined as all property of a capital nature, complete in itself (stands alone), which does not lose its identity, has an anticipated service life greater than 2 years, and has a unit cost of at least $5,000 (or its Ghana Cedis equivalent). In certain cases, Sponsors may want to see the manufacturer's specifications and price list of the capital equipment, especially when the equipment is very expensive. Thus, whenever possible, it will be prudent to specify the name and manufacturer of the equipment in the budget.

Materials and Supplies

- Materials and supplies are defined as (1) consumable supplies, regardless of cost, or (2) equipment with a unit value of under $5,000 (or its Ghana Cedis equivalent) or a useful life of less than 2 years.
- Costs for photocopying materials, publications, reference books,

equipment/computer maintenance, service Centre rates, and contracted services are all categorized as materials and supplies.

- General office supplies, such as staples and pens, may not be allowable on sponsored projects unless they are related to specific project activities rather than general departmental activities. Budgets that include such items must include a budget justification unique to the project for such materials.

Travel

For travel costs, the budget must outline who will be travelling as well as the proposed destination, purpose, and duration of the trip. This must be done for each person on the trip. For each trip, a breakdown of the estimated expenses for each person should include transportation costs (e.g., roundtrip coach air fare), per diem or living expenses, and any other related expenses such as ground transportation or conference registration fees.

Sub-awards

- A sub-award, also known as subcontract, sub grant, or sub-agreement, is a formal written agreement between UPSA and another party to perform a portion of the sponsored project. Where it is anticipated there will be a sub award, the sub recipient(s), including subcontractors and consultants, must be identified in the proposed budget to the sponsor so that costs are calculated correctly and documented appropriately. When sub-awards are anticipated, the associated F&A costs only apply to the first $25,000 of each subcontract.

- It is mandatory that the proposed subcontractor prepares a statement of work and detailed budget signed by both the subcontractor and the contractor. In certain cases, Sponsor approval may be required prior to entering into a subcontract. However, in

a vendor relationship, there will be no need for sponsor approval, unless specified in the award terms and conditions.

- When a sub-award is proposed in a sponsored budget, UPSA must perform a budget cost price analysis to ensure that the agreement provides fair and reasonable contract prices.

Consultants

A consultant is an individual or a firm offering professional or specialized services for a fixed rate or fee. While the University may control the direction of the consultant's work with respect to achieving the desired results or objectives, it does not control the methodology for achieving the results. Where it is anticipated that a sponsored project will hire the services of a consultant, the following information should be included in the budget and budget justification: consultant name and title, daily fee, number of days to be engaged, and any other expenses (e.g., travel).

7.8.2 Indirect Costs

Indirect Costs is also known as Facilities and Administrative Costs (F & A) or Overhead. These are costs that cannot be readily and specifically identified with or associated with any specific sponsored project but provide an overall benefit to the sponsored agreements. Examples of F & A include: building, utilities, grounds and maintenance, human resource services, central administrative services, telephone, internet access, etc. In making provisions for these costs in the budget, the rates are based on actual expenditures incurred by the University or established through a combination of audit and negotiation mechanisms. These rates must be applied consistently to each sponsored award.

7.9 Cost Sharing

Cost sharing arises when a portion of the total project costs is not borne by the Sponsor but by the University or third party. In preparing the proposed budget, it is important to state the entire committed cost of the project, and delineate the amount requested from the sponsor as well as the other costs that UPSA commits to pay (i.e. cost shared). Before committing the University to any cost sharing, PIs must assure that funds are identified and secured. Voluntary effort over and above what has

been committed in the budget does not have to be treated as cost sharing. Generally, cost sharing is in the form of an actual cash expenditure of funds and may take any of the following forms:

- Mandatory Cost Sharing –this cost sharing is required by the sponsor as a condition for obtaining an award. Thus, the cost sharing commitment must be included in the proposal to be considered by the sponsor.

- Voluntary Cost Sharing –this cost sharing is not required by the sponsor as a condition for obtaining an award. However, if cost sharing is voluntarily offered, it must be included in the proposal.

- Matching Cost Sharing – this is where the sponsor requires the University to match grant funds in some proportion with funds from another party, either from the University or more typically from another sponsor (with both sponsors' approval). Matching requirements may be in the form of actual cash expenditure of funds or may be an "in-kind" match, which is the value of non-cash contributions to the project. An in-kind or matching contribution made by a party other

than UPSA requires documentation from the third party supporting the use of the funds as in-kind/matching.

- Committed Cost Sharing – this is when an award is received in which there was a commitment by UPSA in the proposal to share in project cost, (voluntary or mandatory cost sharing or, matching) the activity becomes a binding commitment which the University must provide as part of the performance of the sponsored agreement. This commitment must be tracked in the accounting system as cost sharing.

- Voluntary Uncommitted Cost Sharing – this refers to faculty-donated effort or other direct costs above that agreed to as part of the award. Since this effort is not normally proposed in the budget but constitutes "additional" time or materials, it is not considered a binding agreement; as such, it shall not be accounted for as cost sharing.[SEP]

7.9.1   Costs that can be shared

In terms of accounting or budgeting, cost sharing may consist of allowable direct and/or F&A costs. Regarding

direct costs, it may take the form of faculty, student, or staff effort to the performance of a sponsored agreement. This kind of commitment to provide support binds the University to contribute the effort and record the associated expenditures including fringe benefits as cost sharing. Apart from this, other allowable direct costs that may be cost shared are:

- travel expenses
- items that do not meet the capitalization threshold
- laboratory supplies
- the University contribution to graduate student tuition (imputed)

Facilities and Administrative Costs (Indirect Costs) can also be cost shared. When direct costs are cost shared, the F&A costs associated with the direct costs are automatically cost shared.

7.9.2 Cost that cannot be shared

The following expenses cannot be offered as cost sharing commitments in sponsored project proposals:

- Unallowable costs
- University facilities such as laboratory space. Where University facilities are to be offered for use, PIs must characterize them as "available

for the performance of the sponsored agreement at no direct cost to the project."

- University utilities
- Equipment, unless the receipt of the award is contingent upon such cost sharing.

7.9.3 Source of Funds for Cost-Shared Expenditures

Identification and provision of resources for cost sharing of direct costs (including equipment) is always the responsibility of the PI. The PI may NOT utilize funds from another award as the source of cost sharing, except as authorized by the concerned sponsor. The PI may utilize funds from other award as the source of cost sharing ONLY when specifically allowed by both parties. Funds for cost shared expenditures are typically identified from among gift, endowment income, operating budget, or other department designated funds.

7.9.4 Reporting Cost Sharing

The RCC is responsible for provision of information to sponsoring agencies that demonstrate that the University has fulfilled its mandatory cost sharing commitments. Although the University may grant overdraft to a sponsored project, it is not to be reported as cost sharing to a sponsor.

7.10   Cost Transfer

A cost transfer occurs whenever an expense is moved from where it was originally charged. Legitimate cost transfers are generally necessary to correct genuine errors in processing the original charge or amend errors caused by lack of some vital information at the time of the original charge. These legitimate cost transfer arise out of genuine typos in the original coding; lack of timely coding information; inability to change the coding (system constraints) before processing an expense; and project splits happening after incurring the expense. To the contrary, illegitimate cost transfer may also occurred examples of which include:

- Transfers of overdrafts on one project to use funds available in an unrelated project
- Transfers that do not benefit the project charged or meet the test of allowability
- Transfers that park charges until a suitable account is available to charge
- Transfers after the allowable time.

To be legitimate, cost transfer must be timely, complete, and comply with allowability, allocability, and reasonableness requirements. There must also be

thorough and proper documentation to support cost transfer transactions.

7.11 Costs Estimating Methods

When estimating the amount to be budgeted for project expenses, estimating methods must be consistent with UPSA accounting practices and must allow expenditures to be accumulated and reported to at least the same level of detail as the estimate.

7.12 Rebudgeting

When there is considerable variation in sponsor policies relative to a budget, revisions in the original budget may become necessary (i.e. Rebudgeting). Where budget revisions are contemplated, the award terms and/or sponsor agency guidelines must be consulted. To the extent possible, budget revisions should reflect all necessary reallocations of resources that are foreseen through the end of the budget period. If prior sponsor approval is required for a budget revision, a request should be made to the program officer as designated in the award, providing sufficient details and justification for the revisions and justification. Once approved by the

sponsor, the budget revision will be initiated by the RCC and the PI.

7.13 Budget Justifications

Budget justifications provide the sponsor with a rationale for certain items in the budget. Normally, sponsors may want clarifying information on how budget calculations are made for faculty and staff salaries, fringe benefits, F&A rates, special equipment, travel, sub-awards, etc. These clarifications should be provided under budget justifications.

In preparing budgets, UPSA is obligated to treat types of expenses consistently as either direct or indirect costs. Therefore, if a proposed budget charges directly expenditures that will normally be included as indirect costs (e.g. clerical and administrative expenses, general-purpose equipment, or operations and maintenance), then, those expenses must be supported in the proposal by an explicit budget justification.

7.14 Reporting

Different sponsored projects may have different reporting requirements.

However, the two most commonly required reports are:

- Final Technical Report and
- Financial Status Report

It is also important to note that some sponsored projects may require monthly, semi-annual, annual or one-off report at the end of the project period which could cover several years. Therefore, it is advisable that the PI and the RCC to verify the reporting requirement from the terms and conditions of the award.

7.14.1 Final Technical Report

It is not a requirement that PIs must submit copies of their Final Technical Report(s) to the RCC but if a PI chooses to do so, the RCC will be obliged to accept and maintain it. What is important and necessary is that PIs should submit their Final Technical Report(s) to sponsors on time since sponsors may withhold final payment until the reports have been received and accepted. A copy of the transmittal for the report should be submitted to the RCC. As the central research administrator, the RCC may monitor the progress of sponsored research to ensure that reports are submitted on time. It can also contact the sponsors to inquire about the status of the reports and withheld payments.

7.14.2 Final Financial Status Report

Since sponsors may have different requirements for Final Financial Status Reports, it is absolutely necessary for PI and PFO to review the award terms and conditions for specific sponsors to ensure compliance. The important thing to remember is that funds must be expended and must be consistent with:

- The purpose for which the award is made
- The terms of the approved budget by the sponsor

As indicated earlier, some sponsored projects may require monthly, semi-annual, and annual financial status report in addition to the final report at the end of the project period. Whatever the requirements may be, it is incumbent on the PI to meet the FSR deadlines since this is important for future funding and on-going sponsor relationships.

7.15   Audits

Audits are reviews or regulated examinations of internal controls, records and procedures. Audits determine the level of organizational and individual compliance with University policies and/or accounting standards and regulations. Audits also determine the need for any

corrective actions to ensure compliance with the policies, regulations, and laws, as well as, the time schedule for completing any corrective actions required.

7.15.1 Types of Audits

Generally, audits fall into two categories – internal and external. Internal audits are usually part of internal control systems aimed at operations with the view to detecting, preventing and correcting non-compliance. External audits on the other hand are usually carried out by an accredited audit firm or agency to determine if controls, records and procedures are consistent with what has been laid down. With regard to sponsored projects, there are a number of external audits that can be conducted. These include:

- Sponsor Agency Audits
- Sponsor Site Visits
- Financial Statement Audits.

Sponsor Agency Audits

These are ad hoc audits by sponsors agency financial (not program) staff or an outside chartered accountancy firm's staff. They can be for specific awards/programs, for specific types of expenditures such as travel or

equipment, or for specific functional areas such as procurement.   These audits can be on site or desk audits via mail or email. On site audits generally are more comprehensive than desk audits. These audits generally require responses within specific deadlines and can require specific information from the PIs and/or PFO. These audits will normally be coordinated through the RCC and the Finance Directorate.

Sponsor Site Visits

These are ad hoc site visits by the sponsor program staff. In most cases, these are not audits, but, occasionally the sponsor representative may ask for information relating to the financial award stemming from the University's financial books and records. When they do, these become audits and should be regarded as Sponsor Agency Audits. Again, these sponsor site visits will be coordinated through the RCC.

Financial Statement Audit

This is a periodic audit conducted by the Ghana Audit Service to ensure UPSA's financial statement accurately reflects the financial activities for the period and in accordance with generally accepted accounting

principles. This audit is coordinated through the Finance Directorate.

7.16 Financial Close-Out

The RCC is responsible for overseeing the proper closeout of all sponsored projects. PIs and PFO are responsible for the timely preparation and submission of all required reports (including final technical reports and final financial reports). All sponsoring agencies expect the University to adhere to the reporting requirements outlined terms and conditions. Failure to do so can jeopardize current and future funding; therefore, it is essential that terms are met. In this regard, PIs and PFO must assure that such reports are adequate and must achieve the following:

- Compliance with the requirements of all sponsors
- Effective fiscal management of awards
- Maintenance of data integrity from timely closeout of expired projects

7.16.1 Closeout Steps

1. Pre-closeout stage: A copy of the FSR is submitted to the RCC by the PI and PFO with advice regarding:

- Deficits
- Residuals
- Residuals are kept if approved by Sponsor. If not, DOF is notified to issue a refund.

2. Closeout stage: Before Closeout is complete, the following must be done:
    - Ensure all deliverables have been submitted to the sponsor.
    - Budget must equal expenses reported.
    - All cash must be received and posted to the award.
    - Deficits must be resolved.
    - Refunds or residual transfers must be processed.
    - Award close out finalized.

3. Final Closeout: Project status is set to CLOSED after all requirements have been fulfilled.
    - The RCC writes to the Finance Director to inactivate the award after above steps have been completed.

7.17   Financial Records Retention

Records retention is the term applied to the safeguarding of important records that document decisions, policies, financial activities and internal controls. They also document and maintain the University's history and activities. UPSA's Records Retention Policy ensures that the University maintains the integrity of the records for an appropriate and/or required period of time for administrative, legal, financial, and historical purposes.

For the purposes of this section, the focus of records retention is on financial records of sponsored projects. However, it also includes technical, patent and trademark records or any other record that an auditor might request. Good records might prevent adverse audit findings and possibly prevent damages in a lawsuit; therefore, important records should be available and easily accessible when needed. A single missing document in a statistical audit could result in the auditors extrapolating a finding of a few Ghana Cedis to thousands or hundreds of thousands of Ghana Cedis, depending on the sample size.

7.17.1 General rules for sponsored projects records retention

For original sponsored project's financial records, the general rule should be that, UPSA must keep the records for at least three years from the LAST activity on the award. The last activity could be the date of the final payment receipt or the date the final technical or financial report was submitted. If an audit is underway for an award or groups of awards or records, UPSA must keep all the records until the audit is completed; then the financial records can be disposed of if the audit end date is greater than the required retention period. The final custodian of all records and documentation in UPSA is the Document and Information Management Centre (DIMC).

SECTION 8:

POLICIES ON RESEARCH CONDUCT

8.1 Introduction

The content of this section presents key guidelines expected of members of UPSA in the conduct of research.

8.2 Research Principles

While different approaches may be employed in undertaking research, the following are the general principles guiding the conduct of research in the University:

- An information sheet for participants, which sets out clearly what the research is about.
- A consent obtained from research participants.
- Participants should understand the culture of the study area. In some cases, researchers shall be oriented about the research study environment by the Human Resource Unit of the organization.
- Avoid being biased in the conduct of research. As far as possible the researcher should not influence the results of the research in any way.

- All research should be ethical and not harmful in any way to the participants.

8.3   Ethical Consideration Procedures

University researchers have an obligation to the University and their sponsors to conduct research ethically. To this end, UPSA expects Faculty to adhere to the following ethical principles:

- Protect the privacy and wellbeing of humans involved in the research.
- Avoid any potential risk or harm to participants and researcher(s).

Respect sensitivities that may arise and deal with them accordingly.

8.4   Responsible Research Conduct and Integrity

Responsible Conduct of Research is one aspect of UPSA's commitment to maintain the highest possible standards for integrity among students, faculty and researchers, as reflected in UPSA's Quality Manual.

8.5   Research Integrity

The University is committed to the highest standards of research integrity. It expects all its staff and students to

observe the highest standards of ethics and integrity in the conduct of their research.

The University through the RCC have an obligation to foster the highest standards of conduct of any researcher carrying out research using the name of University. They are also responsible for the ethical basis of the research and its funding and for the safety of all involved in the research process. In addition, where available, the University expects researchers to observe the standards of practice set out in guidelines published by funders, journals, publishers, scientific societies and other relevant professional bodies.

The receipt of funding from these agencies requires the University to confirm compliance with their terms and conditions; it is therefore essential that all researchers are aware of their responsibility to observe these standards during their work.

The Heads of Schools or Research Institute Directors shall bring to the attention of any employee or student carrying out research for the relevant School or Institute any specific standards and ethics which may be applicable in that School or Institute.

8.6   Research Misconduct

The University expects all its members to observe the highest standards in the conduct of their research. Not upholding such standards, either intentionally or unintentionally, damages the scientific process or harms research participants, colleagues, the University and society as a whole.

The University's code also defines the procedure for handling allegations, investigations, and the reporting of research misconduct.

Research misconduct policies shall provide guidance on responsible conduct in three areas. They:

1.   establish definitions for misconduct in research,
2.   outline procedures for reporting and investigating misconduct, and
3.   provide protection for whistleblowers (persons who report misconduct) and persons accused of misconduct.

8.6.1 Definition of Misconduct

For the purpose of the research of the University, a misconduct shall mean fabrication, falsification, plagiarism, or deception in proposing, carrying out, or

reporting results of research, and deliberate or negligent deviations from accepted practice in carrying out research.

The University shall consider research misconduct with the following actions but not limited to:

1. represent a "significant departure from accepted practices";
2. have been "committed intentionally, or unintentionally"; and
3. be "proven by a preponderance of evidence."

Research misconduct shall not include honest error or honest differences in interpretation or judgments in evaluating research methods or results, or misconduct (including gross misconduct) unrelated to research processes.

8.6.2 Policy Statement on Research Misconduct

A. Responsibilities of All Members of the University Community

1. All researchers of the University community have a responsibility to as much as possible guard against research misconduct by themselves, their

colleagues and collaborators, and the people they teach or supervise.

2. All researchers of the University community shall report research misconduct to the RCC.

3. If an individual is unsure whether a suspected incident falls within the definition of research misconduct, he or she may consult the RCC informally.

4. The RCC will advise on whether the circumstances described by the individual are tantamount to the definition of research misconduct.

5. The RCC may refer the individual or allegation to the appropriate office if the need arises.

6. All researchers of the University community shall cooperate with a research misconduct preliminary assessment, inquiry, or investigation, and shall provide relevant evidence in the course of research misconduct proceedings.

7. When suspected research misconduct involves external funding, the University

shall comply with any additional regulations, policies and reporting obligations required by the funder.

B.   Protecting Researchers

1.   All authorities responsible to research misconduct allegations, including respondents, complainants, witnesses, committee members, the RCC, and staff, are entitled to be treated with respect.

2.   As per the requirement, the RCC and other institutional officials shall make all reasonable and practical efforts to protect or restore the reputation of persons alleged to have engaged in research misconduct, but against whom no finding of research misconduct is made.

3.   No person may retaliate in any way against complainants, witnesses, committee members, or the RCC and his or her staff. The RCC shall investigate reports of alleged or apparent retaliation and recommend appropriate actions to the Director of RCC.

C.   How to Raise Misconduct Concerns

Misconduct in research can be challenged in writing to the Director of RCC for clarification and or support.

Any third party (representatives of research funders, research journals, professional bodies) wishing to raise concerns, in confidence, about the integrity of research at the University are invited in the first instance to contact the Director.

8.7   Conflict of Interest and Commitments

At all levels of research misconduct activities, all parties involved shall identify and disclose to the RCC Director as appropriate, any real or perceived conflict of interest.

If such conflicts are present, the individual shall recuse himself or herself from any investigative or decisional role in the case. If any prospective committee member at any point in the process presents a conflict of interest, that committee member shall be replaced by the Director of RCC. If the RCC representative has a conflict of interest, the Director of RCC shall name a replacement to carry out the functions of the RIO under this Policy for the particular matter. If the Director has a conflict of interest, the VC shall name a replacement to carry out the functions of the

Director under this Policy for the particular matter under consideration. Conflicts of interest on the part of Deans or Departmental Heads shall be dealt with by the Director of RCC. If it becomes necessary to appoint any replacement during the course of the process, the new appointee shall be fully informed regarding earlier procedures and evidence secured, but the process shall not commence at fresh.

The Director of RCC shall be responsible for resolving disagreements over what constitutes a conflict of interest, except in the case of alleged conflicts involving the DO, in which case the Dean of the Faculty is responsible.

Conflict of Commitment: Private interests or non-University activities that can harm or interfere with the productivity and involvement of University employees. This refers to an individual's distribution of effort between employment obligations to the University and to outside professional activities.

Activities and situations that could present conflicts of interest or commitment can be divided into three categories:

    A.   Activities that ordinarily are permissible.

B. Activities that appear to present potential conflicts of interest or commitment.

C. Activities that clearly present such serious problems as to be incompatible with University policies.

In all cases of potential conflict, written agreement should be obtained before any commitment is made.

8.8   Health and Safety

The University shall be committed to continued advancement of an institutional safety and health culture with strong programmes of personal safety, accident and injury prevention, wellness promotion, and compliance with applicable environmental, health and safety laws and regulations when undertaking any research activity. The University shall make all reasonable efforts to:

- Promote institutional and personal safety, health and wellness;

- Provide information to the University community about health and safety hazards in relation to any research;

- Identify and correct health and safety hazards and encourage the University community to report potential hazards;

- Conduct activities in a manner that is protective of the environment, and inform the University community regarding environmental impacts associated with institutional operations.

8.9   Use of UPSA Name

The name "University of Professional Studies, Accra (UPSA)" and how it is used for any research activity shall be under the strict directive of the University's research policy.

The RCC shall coordinate all requests for use of the UPSA name and insignias, which are trademarks of the University. The Director of the RCC is the individual responsible for making final decisions on use of the name and insignias, including the names of individual units of the University for the purpose of research. Any use of the University name for research activity by any researcher shall be submitted to the Office of the Vice Chancellor of the University through the Director of RCC. The Director of RCC shall review the request and send a copy of recommendation to the Office of the Vice Chancellor.

SECTION 9:

PROPRIETARY ISSUES, RETENTION AND DISPOSAL
OF RESEARCH MATERIALS

9.1   Introduction

This section discusses issues in relation to proprietary, retention and disposal of research data and resources in the conduct of research in UPSA.

9.2   Proprietary Issues

All proprietary information arising out of research conducted by faculty shall be owned by the University. Where external Collaborators are involved, proprietary information shall be subject to the University Research Policy Guidelines.

9.2.1 Publication and Authorship Rights

Researchers are encouraged to discuss recognition of authorship at an early stage in the project, and where possible, reach a decision before the writing begins. Researchers should record and retain any initial agreement on recognition of authorship and any subsequent changes to that agreement. Researchers are also encouraged to review these arrangements

periodically, especially at the request of any one of the participants.

While there exist guidelines and conventions for specific publishers, it is important for author(s) to recognize the contribution of all researchers in publishing the research output. Contributions that do not require recognition of authorship may be acknowledged.

In cases students and their supervisors decide to publish the research project, students should be considered as co-authors.

Authorship in a publication becomes mandatory if a person makes a significant contribution to a work in at least one of the following ways:

    (i)   conception and design of research

    (ii) analysis and interpretation of data

    (iii) drafting the publication or revising it for substantive intellectual content.

It should be noted that, the following are important but not sufficient on their own to justify attribution of authorship:

    i.   participation solely in the acquisition of funding

    ii. routine collection of data

    iii. general supervision or oversight of a research group or individual.

Authors of a publication shall take public responsibility for at least that part of the research that falls within their area of expertise, or the entire research report. All authors must approve the final version of the publication.

9.2.2 Patents and Licensing

All patentable innovations developed in the conduct of research by faculty and students of the University shall belong to the University. The University shall have sole right to determine the disposition of innovations sponsored by the University.

In the case of a grant or contract between a sponsor and the University, agreements with respect to the disposition of rights to patentable innovations will be jointly determined by the sponsor and the University.

9.2.3 Copyrights

Copyright is an important form of intellectual property protection. Generally, under copyright law, employers own the copyrights to works produced by employees in the course and scope of their employment, unless the employer has a policy that provides otherwise. Copyright law encourages the creative efforts of authors by providing for exclusive rights to following:

- production and distribution of copies of the work

- performing or displaying the work publicly
- creating derivative works
- preparing transitional works
- authorizing others to use your work
- reusing your work in teaching, future publications, and in all scholarly and professional activities.
- posting your work on the web page, in a discipline archive or in an institutional repository

The University shall claim ownership of works such as scholarly articles, project documents, innovations undertaken using University resources; especially, financial resources. However, the faculty and students own the copyrights of their research work, subject to limited contractual exceptions.

A faculty owns the copyrights to scholarly works, literary works, art works, architectural works and textbooks that such faculty member produces regardless of the form of expression, and the University retains the non-transferable, perpetual, non-exclusive right to use such works on a royalty-free basis solely for the University's education, teaching and research activities, except as follows:

a) If the work of a faculty member is subject to a contractual obligation of the University, such as a sponsored research agreement, then the ownership of the copyrights with respect to such work shall be governed by the terms of the contractual obligation of the University.

b) If a faculty member has agreed with the University to produce a specific work for the University, then the ownership of the copyrights with respect to such work shall be governed by the terms of the agreement with the University.

Students own the copyrights to dissertations, theses, papers and literary works that they produce during the course of their study. However, the University retains the non-transferable, perpetual, non-exclusive right to use such works on a royalty-free basis solely for the University's teaching and research activities, except as follows:

a) If student's work is subject to a contractual obligation of the University, such as a sponsored research agreement, then the ownership of the copyrights shall be governed by the terms of the contractual obligation of

the University.

b) If a student has agreed with the University to produce a specific work for the University, then the ownership of the copyrights shall be governed by the terms of the agreement with the University.

c) If a student's work is produced in the course and scope of employment at the University, then the ownership of the copyrights with respect to such work vests in the University.

9.3   Data and Resource Ownership

The University can conduct research with its own resources or with resources from a collaborating institution. There shall be clearly outlined terms and agreements between the University and the collaborators. If the agreement indicates the University should be the owner of the research data, it shall adhere to the requirements of the collaborator. The principal investigator is responsible among others for:

1. Ensuring proper management and retention of research data.

2. Establishing and maintaining appropriate procedures for the protection of research data and other essential records, particularly for long-term research projects;

3. Ensuring compliance with sponsor's requirements;

4. Maintaining confidentiality of research data, where necessary;

5. Complying with applicable rules and regulations of the University in terms of research.

9.4   Data Sharing and Public Access

Data sharing is essential for expedited translation of research results into knowledge. Reasonable access to research data should normally be available to any member of the research group in which the data was collected, when such access is not limited otherwise by an agreement, policy or regulation. Prior to the initiation of the research project, the Principal Investigator shall come to a written agreement with the research group, specifying who has access to what research data.

Research data created by investigators may be shared for research or scholarly purposes consistent with standard practices of their discipline with other individuals when such sharing is not limited by written agreement, policy or regulation. Investigators shall make every effort to protect intellectual property rights as defined and

governed by the intellectual property policy of the
University.

9.5   **Data Retention**

To optimize research outcomes, research data must be
documented, stored, secured against theft, misuse or
damage. Research data should be retained for a minimum
of five years after the project report has been submitted
and papers published. The period can vary depending on
the discipline and type of research or project. In addition,
any of the following circumstances may justify longer
periods of retention:

1. Research data shall be kept for as long as
    necessary to protect any intellectual property
    resulting from the work;
2. To allow appropriate response to questions
    about research accuracy, authenticity, primacy
    and compliance with laws and regulations
    governing the conduct of research.
3. In cases where litigation or other dispute,
    financial management review or audit related
    to the research project arise, the research data
    and other project records must be retained
    until all disputes, claims, financial

management review or audit findings involving the records have been resolved.

4. If a student is involved, research data must be retained at least until the student's degree is awarded and any resulting papers published.

5. In cases the research is funded by an institution with its own specific provision regarding data retention, ownership, access, etc, such provisions will supersede this manual. If other regulations, sponsor policies or guidelines, journal publication guidelines or other University policies require longer retention, all applicable sources must be reviewed and the research data must be kept for the longest period of time applicable.

9.6   Data Disposal

1. The disposal of research data lies in the purview of the principal investigator and shall be in accordance with data retention and disposal as well as sponsorship requirements.

2. Data must be disposed of safely and in consistence with ethical procedures and standards.

3. Data can only be disposed of after the resolution of any dispute or challenge of research results.

4. In some cases, it is advisable to document the manner of destruction, for example if animals, human subjects and hazardous materials are involved.

9.7   Data Reuse

Research data may be transferred to a nationally controlled inter-institutional database to facilitate collaborative research across institutions.

Information on the restriction of access and reuse of research data must be included in the database.

SECTION 10:

ENFORCEMENT AND COMPLIANCE PROCESSES

10.1   Introduction

This section discusses issues in relation to enforcement, regulation and compliance in the conduct of research in UPSA. The University is committed to the highest possible standards of integrity and ethical principles in research. Research misconduct in the University shall include but not limited to fabrication, falsification, or plagiarism in undertaking research.

10.2   Reporting Non-Compliant Research Conduct

Upon suspicion of non-compliance in any research in the University by any concerned person, a case should be made in either verbal or written form clearly stating the suspicion to the RCC. The RCC has primary responsibility for implementing the policies and procedures of the University on research misconduct.

10.3   Enforcement

For proper enforcement of research and ethical standards, the following shall be adhered to;

    i.   All complaints and breaches of research and ethical standards shall be reported to the RCC.

ii. The RCC shall make available all the policies on research and ethical conducts to persons undertaking research in the University.

iii. The RCC shall also outline sanctions for breaching any of the research and ethical standards.

iv. The RCC shall ensure the privacy of whistleblowers and complainants are protected.

10.4 Complaints and Grievance Procedures

The following steps shall be followed when complaints of research misconducts are submitted to the RCC:

A. Preliminary Assessment

Upon receipt of an allegation, the RCC shall assess the information presented to determine whether it constitutes alleged research misconduct or whether the allegation is credible and specific so that the potential evidence of research misconduct may be identified.

B. Inquiry

An enquiry shall be guided by the following:

i. The RCC shall forward the complaints received to the Research Compliance Unit.

ii. The RCC shall investigate and make available their findings to the parties concerned.

iii. The RCC shall file its Annual Report on all Possible Research Misconducts received.

iv. The RCC shall submit its policies and procedures for responding to allegations of research misconduct to the director of RCC upon request

v. The RCC shall maintain policies and procedures that comply with the RAM's Regulation.

C. Finding

A finding of research misconduct requires proof of any of the following:

i. Fabrication, falsification or plagiarism that constitutes a significant departure from accepted practices of the relevant scholarly community.

ii. Misconduct committed either intentionally or knowingly or recklessly.

      iii.   The allegation of misconduct must be proven by a preponderance of the evidence.

      iv.   Research misconduct does not include honest error, differences of opinion, or authorship credit disputes.

10.5 Compliance

The Research Ethics Committee (REC) shall review and approve all research involving human subjects before the project commences. Prior to beginning a study or a research project the researcher(s) shall apply to the REC for review and approval.

10.6 Overview of Procedures for Investigation

Subject to the specific procedures set forth in this policy, the RCC process for responding to allegations of research misconduct shall involve four distinct phases:

When an allegation is received, the RCC shall assess whether the allegation falls under the definition of research misconduct and is sufficiently credible and specific so that potential evidence of research misconduct may be identified. If these criteria are met, the Centre will establish an inquiry committee. The RCU will oversee the

requisitioning of original documents and materials if necessary, to protect the integrity of the proceedings.

10.7   Investigation Procedures

If the inquiry leads to the conclusion that an investigation is warranted, it will be guided by the following considerations:

1. The formal investigation should begin within 30 days of the completion of the inquiry and after written notice to the respondent. The investigation is to be completed and the final report sent to the Director of RCC within 90 days (from the start of an investigation). If an investigation cannot be completed within this time frame, the Director should be notified as soon as possible.

2. An investigation should normally include an examination of the relevant documentation, including but not limited to relevant research data and proposals, publications, correspondence, and memoranda of telephone calls.

3. Complainants, respondents, and witnesses who may have information related to the

matter should be interviewed. Complete written summaries of each interview should be provided to the individual being questioned, and any comments should be appended to the summary, or reflected in a revised summary if the interviewer agrees. The summaries must be retained by the Director.

4. All significant issues should be pursued until the investigator is reasonably certain that he or she has amassed all necessary and appropriate information.

5. A draft written report of findings shall be made available to the respondent with the opportunity to provide comments for the consideration of those conducting the investigation. Where identified and appropriate, complainants should also receive the portions of the draft report which concern the role or opinions they had in the investigation. Any comments on the draft from the respondent (and from the complainants, if applicable) shall be appended to the final report.

NOTE: If there is more than one respondent, and their involvements are found not to be

identical, separate draft reports should be prepared if practical, in order to preserve confidentiality.

6. In addition to the interview summaries and comments by the respondent and complainant(s) (if applicable) on the draft report, the final written report should include:

    - a description of the policies and procedures followed

    - how and from whom relevant information was obtained

    - the findings and basis for recommendation

7. If the Director of the RCC considers that sanctions may be warranted, then he shall refer the final report to the University official who makes that determination. The report should be sufficient for the appropriate University officer to determine whether disciplinary action is called for. If any sanctions result, the Director of RCC shall be informed, and he or she should append that information to the final report.

10.8   Sanctions and Remedies

If the RCC determines that research misconduct is sustained by the findings, it will be responsible for determining the nature and severity of sanction, which may include:

   i.   Withdrawal or correction of all pending or published research output where research misconduct was found

   i.   Removal of the responsible person from the particular project

   ii. Letter of reprimand

   iii. Special monitoring of future work

   iv. Suspension

   v.   Demotion

   vi. Initiate steps leading to the termination of employment;

   vii. Restitution of funds to the grantor agency as appropriate; or

   viii. Any other action appropriate to the research misconduct

When the sanctions are applied, the offended party shall have the right to apply for a review within 10 working days.

REFERENCES

1.   Godin, B. (2003), Measuring Science: Is There Basic Research Without Statistics, Social Science Information, 42 (1): 57-90.

2.   Godin, B. (2005), Measurement of Science and Technology: 1920 to the Present, London: Routledge. Godin, B., and J. Lane (2011), Do Science, Technology and Innovation Indicators Actually Indicate Reality? Some Thoughts on How We Got Here and What to Do About It, Communication Presented at the Roundtable Meeting on the Science, Technology and Innovation Global Assessment Programme (STIGAP), UNESCO, Paris, 4-5 July 2011.

3.   Lane, J., and J. L. Flagg (2010), Translating Three States of Knowledge: Discovery, Invention and Innovation, Implementation Science, 5 (9). Open Access: http://www.implementationscience.com/content/5/1/9. Access 10/11/2017 at 18:00

4.   Holland, M. and Spraragen (1933), Research in Hard Times, Division of Engineering and Industrial Research National Research Council, Washington, p. 13.

5. Barrows, A. l. (1997), The relationship of the Industrial Research, National Resources Planning Board, Washington: USGPO, p. 367.

6. Zachary, G. P. (2003), Endless Frontier: Vannevar Bush, Engineer of the American Century, Cambridge: MIT Press, 1999.