

ZAMBIA COLLEGES OF MEDICINE & SURGERY

(Registered Society)



MINISTRY OF HEALTH



Advancing Specialist Care & Professional Growth

Specialty Training Programme (STP) Curriculum & Learning Guide for Obstetrics and Gynaecology (2017)

Table of Contents

| | |
|---------------------------|---|
| GENERAL INTRODUCTION..... | 1 |
|---------------------------|---|

Contents

| | |
|--|----|
| GENERAL INTRODUCTION..... | 1 |
| Vision..... | 1 |
| Mission Statement..... | 1 |
| Values: | 2 |
| RATIONALE FOR THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY | 2 |
| Outcome 1. Apply, at mastery level, Biomedical Sciences, Behavioural & Sociology, and Scientific Principles to the Practice of Obstetrics and Gynaecology..... | 2 |
| Outcome 2. Competence, at mastery level, in Obstetrics and Gynaecology Clinical Practice. On successful completion of the work-based STP trainees: | 3 |
| Category I: Scientific foundations | 4 |
| Category II: Clinical Skills | 5 |
| Category III: Communication and Interpersonal Skills | 5 |
| Category IV: Prevention | 5 |
| Category V: Diagnosis..... | 5 |
| Category VII: Patient Safety..... | 5 |
| Category VIII: Information Management..... | 5 |
| Category IX: Ethics, Humanities, and the Law | 6 |
| Category X: Professionalism | 6 |
| Category XI: Leadership & Management..... | 6 |
| ADMISSION CRITERIA TO THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY | 6 |
| CURRICULUM DESIGN/MODEL OF THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY | 6 |
| TEACHING METHODS IN THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY | 6 |
| SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY CURRICULUM STRUCTURE AND MAP | 7 |
| ASSESSMENT IN THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY | 7 |
| Grading Scheme..... | 8 |
| PART 1: MODULES FOR OBSTETRICS AND GYNAECOLOGY SPECIALTY TRAINING PROGRAMME..... | 10 |
| PART 2 MODULES FOR OBSTETRICS AND GYNAECOLOGY SPECIALTY TRAINING PROGRAMME..... | 22 |
| Indicative Resources | 28 |

GENERAL INTRODUCTION

This Curriculum and Learning Guide describes the work-based competence-based professional training programme for the Specialty Training Programme (STP) in Obstetrics and Gynaecology (OBGY) in Zambia. The intended readership for the curriculum and guideline include the following:

- Trainees, host departments and managers of OBGY healthcare services;
- STP OBGY trainers, which includes all those involved in supervising, coordinating, assessing and delivering specialist education and training in obstetrics and gynaecology;
- Academic, administrative and professional staff within Higher Education Institutions Higher Education Institutions (HEIs), the Higher Education Authority (HEA), and the Zambia Qualifications Authority (ZAQA);
- Strategic partners involved in supporting reproductive, maternal, and newborn care, and the training of healthcare practitioners in these related fields.

Zambia Colleges of Medicine and Surgery (ZACOMS) advances professional training of medical specialists using the professional competence-based certification model beyond traditional university-based specialist training. It promotes specialist training as a vital pursuit for a successful professional medical career. The ZACOMS also promotes the increase of universal health coverage (UHC) by promoting equitable access to cost-effective quality specialist care as close to the family as possible for people in Zambia at all levels of socioeconomic status and geographical location. The ZACOMS certifies and admits members and/or fellows as specialists in a medical and/or surgical specialty in any of the various specializations of medicine and surgery.

The Zambia Colleges of Medicine and Surgery (ZACOMS) oversees the training of obstetrics and gynaecology specialists working through the Zambia Association of Gynaecologists and Obstetricians (ZAGO). The ZAGO is a member of the East Southern and Central African College of Obstetrics and Gynaecology (ESCACOG).Whereas, ZAGO is independent of ESCACOG the curriculum of ZACOMS STP OBGY training is aligned to that of ESCACOG so as to facilitate recognition by the regional body.

The STP OBGY training provides specialist training in maternal and reproductive health. The programme trains graduates to offer specialist care in women's physical, mental health and social well-being at all stages of life including during pregnancy, childbirth and postpartum period.

Vision

Our vision is to be innovative in providing a teaching and support structure that will empower every trainee to excel in Obstetrics and Gynaecology knowledge, skills and research through internal and external collaboration.

Mission Statement

The mission of the STP OBGY training in Zambia is to train specialists who shall endeavour to improve the health care services to women and communities by providing safe, evidence-based, humanistic specialist care in the field of maternal and reproductive

health in an efficient and proficient manner to meet the needs of the Zambian community, and contribute to the field of reproductive health in the region and globally.

Values:

- Professional excellence
- Integrity
- Sensitivity to reproductive health needs
- Interdisciplinary, inter institutional collaboration
- Continuous professional development
- Innovation
- Academic Excellence
- Self and peer review

RATIONALE FOR THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY

The STP OBGY aims train specialists in obstetrics and gynaecology in order to prepare them for specialist service in the healthcare service. The curriculum is informed by the training requirements of the Health Professions Council of Zambia (HPCZ) and the professional creed of the Zambia Association of Gynaecologists and Obstetricians (ZAGO). The training programme encourages self-directed learning, life-long learning, and student-centred approaches while providing robust and structured guidance. The key outcomes are twofold as stipulated in outcome 1 and 2.

Outcome 1. Apply, at mastery level, Biomedical Sciences, Behavioural & Sociology, and Scientific Principles to the Practice of Obstetrics and Gynaecology

1. The graduate should be able to apply to obstetrics and gynaecology practice biomedical scientific principles, method and knowledge relating to anatomy, biochemistry, cell biology, genetics, immunology, microbiology, nutrition, pathology, pharmacology and physiology. The graduate should be able to:
 - a) Explain normal human structure and function relevant to obstetrics and gynaecology.
 - b) Explain the scientific bases for common diseases and conditions' signs, symptoms and treatment relevant to obstetrics and gynaecology.
 - c) Justify and explain the scientific bases of common investigations for diseases and conditions relevant to obstetrics and gynaecology..
 - d) Demonstrate knowledge of drugs, drug actions, side effects, and interactions relevant to obstetrics and gynaecology.
2. Apply Behavioral and Sociology Principles to the Practice of Obstetrics and Gynaecology
 - a) Explain normal human behavior relevant to obstetrics and gynaecology.
 - b) Discuss psychological and social concepts of health, illness and disease relevant to obstetrics and gynaecology.

- c) Apply theoretical frameworks of psychology and sociology to explain the varied responses of individuals, groups and societies to disease relevant to obstetrics and gynaecology.
 - d) Explain psychological and social factors that contribute to illness, the course of the disease and the success of treatment relevant to obstetrics and gynaecology.
3. Apply Population Health to the Practice of Obstetrics and Gynaecology
 - a) Discuss population health principles related to determinants of health, health inequalities, health risks and surveillance relevant to obstetrics and gynaecology.
 - b) Discuss the principles underlying the development of health and health service policy, including issues related to health financing, and clinical guidelines relevant to obstetrics and gynaecology.
 - c) Evaluate and apply basic principles of infectious and non-communicable disease control at community and hospital level relevant to obstetrics and gynaecology.
 - d) Discuss and apply the principles of primary, secondary, and tertiary prevention of disease relevant to obstetrics and gynaecology.
 4. Apply Scientific Method and Approaches to Obstetrics and Gynaecology Research.
 - a) Evaluate research outcomes of qualitative and quantitative studies in the medical and scientific literature relevant to obstetrics and gynaecology.
 - b) Formulate research questions, study designs or experiments to address the research questions relevant to obstetrics and gynaecology.
 - c) Discuss and apply appropriate research ethics to a research study relevant to obstetrics and gynaecology.

Outcome 2. Competence, at mastery level, in Obstetrics and Gynaecology Clinical Practice. On successful completion of the work-based STP trainees:

1. The trainees should have clinical and specialist expertise in obstetrics and gynaecology, underpinned by broader knowledge, skills, experience and professional attributes necessary for independent practice;
2. The trainees should be able to undertake complex clinical roles, defining and choosing investigative and clinical options, and making key judgements about complex facts and clinical situations.
3. The trainees should contribute to reduction of maternal mortality and improves women's health in the context of the national health priorities, by means of outstanding scientific research and application of safe, high quality, cost effective, evidence based practice within the Zambian health system.
4. The trainees should possess the essential knowledge, skills, experience and attributes required for their role and should demonstrate:
 - A systematic understanding of clinical and scientific knowledge, and a critical awareness of current problems, future developments, research and innovation in obstetrics and gynaecology practice, much of which is at, or informed by, the forefront of their professional practice in a healthcare environment;
 - Clinical and scientific practice that applies knowledge, skills and experience in a healthcare setting, places the patient and the public at the centre of care

- prioritizing patient safety and dignity and reflecting outstanding professional values and standards;
- Clinical, scientific and professional practice that meets the professional standards defined by the Health Professions Council of Zambia (HPCZ);
 - Personal qualities that encompass self-management, self-awareness, acting with integrity and the ability to take responsibility for self-directed learning, reflection and action planning;
 - The ability to analyze and solve problems, define and choose investigative and scientific and/or clinical options, and make key judgments about complex facts in a range of situations;
 - The ability to deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and to communicate their conclusions clearly to specialist and non-specialist audiences including patients and the public;
 - The ability to be independent self-directed learners demonstrating originality in tackling and solving problems and acting autonomously in planning and implementing tasks at a professional level;
 - A comprehensive understanding of the strengths, weaknesses and opportunities for further development of obstetrics and gynaecology as applicable to their own clinical practice, research, innovation and service development which either directly or indirectly leads to improvements in clinical outcomes and scientific practice;
 - Conceptual understanding and advanced scholarship in their specialism that enables the graduate to critically evaluate current research and innovation methodologies and develop critiques of them and, where appropriate, propose new research questions and hypotheses;
 - Scientific and clinical leadership based on the continual advancement of their knowledge, skills and understanding through the independent learning required for continuing professional development.
5. Once registered as a specialist in obstetrics and gynaecology, a range of career development options will be available including sub-specialist training. Alternatively, others may opt to undertake further career development in post, as specialist, through structured Continuing Professional Development (CPD), provided by Accredited CPD providers. Specialist obstetricians and gynaecologists who have successfully completed the STP OBGY will be eligible to compete for available Consultant positions in obstetrics and gynaecology.

The outcomes of the STP OBGY training are affiliated to the following curriculum outcome categories:

Category I: Scientific foundations

Goal 1: Understand the normal structure and function of the human body, at levels from molecules to cells to organs, to the whole organism.

Goal 2: Understand the major pathological processes and their biological alterations.

Goal 4: Understand how the major pathologic processes affect the organ systems.

Goal 5: Integrate basic science and epidemiological knowledge with clinical reasoning.

Goal 6: Understand the principles of scientific method and evidence-based medicine including critical thinking.

Category II: Clinical Skills

Goal 7: Obtain a sensitive, thorough medical history.

Goal 8: Perform a sensitive and accurate physical exam including mental state examination.

Goal 9: Establish and maintain appropriate therapeutic relationships with patients.

Category III: Communication and Interpersonal Skills

Goal 11: Develop the knowledge, skills, and attitudes needed for culturally- competent care.

Goal 12: Participate in discussion and decision-making with patients and families Goal.

Goal 13: Work effectively with other providers in the health system.

Goal 14: Clearly communicate medical information in spoken and written form.

Category IV: Prevention

Goal 15: Develop knowledge, skills, and attitudes to practice the basic principles of prevention.

Goal 16: Practice personalized health planning for long-range goals.

Goal 17: Understand the planning for communities and populations.

Category V: Diagnosis

Goal 18: Elicit and correctly interpret symptoms and signs of obstetric and gynaecological conditions.

Goal 19: Diagnose and demonstrate basic understanding of common disease and conditions.

Goal 20: Appropriately use testing to help guide diagnostic and therapeutic decisions.

Goal 21: Demonstrate sound clinical reasoning.

Category VI: Treatment, Acute and Chronic.

Goal 22: Understand therapeutic options and participate in the multidisciplinary care of patients with complex problems.

Goal 23: Recognize acute life-threatening medical problems and initiate appropriate care

Goal 24: Acquire the knowledge and skills necessary to assist in the management and rehabilitation of chronic diseases.

Goal 25: Participate in care in a variety of settings; including knowledge about palliative care.

Category VII: Patient Safety

Goal 26: Identify and remove common sources of medical errors.

Goal 27: Understand and apply models of Quality Improvement.

Goal 28: Appreciate the challenges associated with reporting and disclosure.

Category VIII: Information Management

Goal 29: Use information and educational technology to facilitate research, education, and patient care.

Category IX: Ethics, Humanities, and the Law

Goal 30: Develop a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diversity.

Goal 31: Develop a critical understanding of the multiple factors that affect the practice of medicine, public health and research.

Goal 32: Incorporate ethical principles in clinical practice and research.

Category X: Professionalism

Goal 33: Develop healthy self-care behaviours and coping skills.

Goal 34: Model service to patients and community.

Category XI: Leadership & Management

Goal 35: Develop interpersonal and communication skills that result in leadership in patient health service delivery and health human resource management.

ADMISSION CRITERIA TO THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY

Applicants to the STP OBGY must possess a primary qualification in medicine, that is, Bachelor of Medicine and Bachelor of Surgery (MB ChB) or equivalent, from a recognized university. Additionally, they must have completed internship and retain full registration and a practising licence issued by the Health Professions Council of Zambia. Other Ministry of Health policies and directives, for example, completion of rural posting, may apply.

CURRICULUM DESIGN/MODEL OF THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY

The STP OBGY Curriculum is a work-based professional competence-based training situated in an accredited training facility managed by specialists in obstetrics and gynaecology with oversight by the Zambia Colleges of Medicine and Surgery (ZACOMS) working through ZAGO.

During the STP OBGY programme the specialty registrar is an integral member of the clinical work of the department in which they are training to gain the required clinical experience and competence. The STP OBGY programme is a work based professional competence-based training leading to the award of the Certificate of Completion of Specialty Training (CCST) by the Zambia Colleges of Medicine and Surgery (ZACOMS). Graduates are then eligible to apply to the Health Professions Council of Zambia to enter the Specialist Registers in Obstetrics and Gynaecology.

TEACHING METHODS IN THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY

The STP OBGY training is a work-based professional competence-based programme and should encompass diverse teaching and learning approaches that are appropriate for the target educational domain, i.e., cognitive (knowledge), psychomotor (practical), or affective (attitude)

domain. The teaching methods may include, but not limited to, the following: expository lectures, tutorials, seminars, practical classes, skills laboratories, clinical demonstrations, clinical clerkships (bedside teaching, ward rounds, ambulatory care teaching, operating theatre experience, post-mortem, and on-call duties), field and community based learning, and ICT supported learning experiences.

The Health Professions Specialty Training Guidelines for Zambia and Zambia Colleges of Medicine and Surgery Society Objectives and By-Laws provide detailed guidance to the trainee about the STP and ZACOMS, respectively.

SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY CURRICULUM STRUCTURE AND MAP

Curriculum Map for the STP OBGY Programme

| STP YEAR 1 | | STP YEAR 2 | | STP YEAR 3 | | STP YEAR 4 | |
|--------------------------------------|---------------------|--|------|--------------------------------------|------|---|----------------------|
| Basic Sciences in OBGY | ZACOMS PT 1 ARCP | Principles of Clinical OBGY II | ARCP | Management in Clinical OBGY | ARCP | Specialized OBGY | ZACOMS CCST Exams |
| Principles of Clinical OBGY | | Research Methodology & Proposal | | Data Collection for Research Project | | Data analysis & write up of Research Project | |
| Ongoing Clinical Management Practice | | Ongoing Clinical Management Practice | | Relevant Subspecialty Rotations | | Ongoing Specialist Clinical Management and Leadership | |
| Part 1: Generic Education & Training | | Part 2: Themed & Specialist Education & Training | | | | | |

N.B. The total number of years, in particular, the themed specialist education and training may vary between different specialties.

1. ARCP = Annual Review of Competence Progression
2. CCST = Certificate of Completion of Specialty Training Examination;
3. STP = Specialty Training Programme;
4. ZACOMS PT 1 = Zambia Colleges of Medicine and Surgery Part 1 Examinations in Basic Sciences, Behavioural Sciences, Health Population Studies, and Professionalism & Ethics; ZACOMS CCST Examinations = Certificate of Completion of Specialist Training in Obstetrics & Gynaecology Examinations

ASSESSMENT IN THE SPECIALTY TRAINING PROGRAMME IN OBSTETRICS AND GYNAECOLOGY

Progression to the next level of training is NOT automatic and is dependent on the trainee satisfying all the competency requirements of each defined level as per this curriculum and learning guide. The assessment framework is designed to provide a coherent system of assessing

both formative and summative assessment which are workplace based and in examination settings.

Each training site must ensure that they use valid, reliable and appropriate methods for assessing the knowledge, clinical skills and attitude domains. The continuous assessments and final annual assessments are weighted at 40% and 60% of the final mark of Annual Review of Competence Progression, respectively. Assessment methods may include, but are not limited to, the following: Log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, objective structured clinical examinations (OSCE), practical examinations, objective structured practical examinations (OSPE), Mini-clinical Examination (MiniCEX), Viva Voce, etc.

It is emphasized that marks from theory examinations **may not** compensate for poor scores in the clinical examinations; Students **MUST** pass the clinical examinations in order to progress to the next stage of training or completion.

| Assessment | Knowledge, Skill and Attitude Domain | Examining Body |
|--|--------------------------------------|--|
| Formative Workplace Based Assessments | Outcome 1 & 2 | Training Site |
| Annual Review of Competence Progression | Outcome 1 & 2 | Training Site in conjunction with ZACOMS |
| ZACOMS Part 1 Examination | Outcome 1 | ZACOMS working through ZAGO |
| ZACOMS Certificate of Completion of Specialist Registration Examinations | Outcome 2 | ZACOMS working through ZAGO |

A candidate shall be allowed a maximum of three attempts for ZACOMS Part 1 and/or Part 2 Examinations. Candidates must have submitted a completed log book to eligible to attempt the ZACOMS Part 2 Examination.

For ease of tracking progress and planning for obstetrics and gynaecology care, all STP OBGY trainees will be registered with ZACOMS and ZAGO for the duration of their training and will be allocated a Health Professions Council of Zambia Specialty Registrar Index Number.

Grading Scheme

The STP OBGY Curriculum and Guide are the basis for all specialty training which contextualize the standards of proficiency set down by the Zambia Colleges of Medicine and Surgery (ZACOMS) in consultation with the Zambia Association of Gynaecology and Obstetrics (ZAGO) in a way that is accessible to the profession and the public. The Certificate of Completion of Specialist Training (CCST) is not graded.

Separate assessments and examinations may be graded to show the level of achievement of the trainee in a particular course or assignment.

Assessment of Attainment of Competence in an Academic Subject

| Status & Level | Description of Competence Features | % Range |
|---------------------------|--|----------------|
| Outright Fail [D] | <ul style="list-style-type: none"> • Has poor and inaccurate command of the subject vocabulary • Has poor and inaccurate command of the concepts (knowledge, skills and attitudes) of the subject across a broad range of topics. | 44.9% & Below |
| Bare Fail [D+] | <ul style="list-style-type: none"> • Has the basics of subject vocabulary • Has the basics of concepts (knowledge, skills and attitudes) of the subject across a broad range of topics • Unable to transfer and apply knowledge, skills and attitudes of the subject in a range of situations. • Unable to exercise independent judgement in a range of situations | 45 – 49.9 |
| Clear Pass [C] | <ul style="list-style-type: none"> • Has sound command of subject vocabulary • Has sound command of concepts (knowledge, skills and attitudes) of the subject across a broad range of topics • Able to formulate responses and demonstrate skill and exhibit appropriate attitude in well-defined and abstract problems/professional settings across a broad range of topics of the subject | 50 – 64.9 |
| Meritorious Pass [B] | <p>All of above in level 3 and:</p> <ul style="list-style-type: none"> • Able to transfer and apply knowledge, skills and attitudes and exercise significant independent judgement in a broad range of topics of the subject | 65 – 74.9 |
| Distinction Pass [A] | <p>All of the above in level 4 and:</p> <ul style="list-style-type: none"> • Displays masterly of complex and specialised areas of knowledge, skills and attitudes in a broad range of topics of the subject. | 75% & Above |

PART 1: MODULES FOR OBSTETRICS AND GYNAECOLOGY SPECIALTY TRAINING PROGRAMME

Principles and Practice of Obstetrics and Gynaecology

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| Course Name Code STP OBGY 1 | <i>Principles and Practice of Obstetrics and Gynaecology</i> |
| Aim/Purpose: | <p>This Course aims at consolidating the applied basic scientific principles underlying the clinical practice of Obstetrics and Gynaecology, including functional and applied aspects and understanding of normal female organs, pregnancy, gestation duration & development of a foetus and abnormal pregnancy, related illnesses and threats for the patient, as well as the foundation for problem solving in applied situations and clinical practice. The course also aims at preparing the trainees for the Clinical Practice in Obstetrics and Gynaecology. This course also aims at developing the trainee as a scientific researcher, making them aware of the importance of evidence based practice by accessing scientific literature and by developing a research project proposal that can contribute to evidence based practice in Zambia in the field of Obstetrics and Gynaecology.</p> |
| Learning Outcomes: | <p>At the completion of the course students will be able to:</p> <ol style="list-style-type: none"> 1. To explain and integrate relevant principles of physiology, anatomy, pharmacology and pathology to the care of women with obstetric and gynaecological health and diseases. 2. To demonstrate advanced skills in history taking and clinical examination of the obstetric and gynaecological patient. 3. To demonstrate a solid basis in knowledge of the principles and practice of common Obstetrics and Gynaecology disease conditions, problem solving skills and health education and counselling skills. 4. To identify, initiate as well as interpret laboratory and bedside investigations required to make a diagnosis and manage the obstetric and gynaecological conditions. 5. To demonstrate the skills and attitudes appropriate for the care of women of all age groups, including communication with patients, their family and colleagues. 6. To appreciate and apply evidence-based clinical obstetrics and gynaecology practice and basic technical skills. 7. To demonstrate basic surgical skills in obstetrics and gynaecology, including performing minor surgery independently and managing common obstetric and gynaecological emergencies. 8. Demonstrate leadership and role modelling to junior doctors and medical trainees. 9. To function as senior house officers (SHO) within the department with clinical duties including: |

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| | <ul style="list-style-type: none"> ▪ Participation in daily ward work ▪ Participating in outpatient clinics ▪ Taking on-calls at SHO level ▪ Supervision of interns and other junior health workers ▪ Teaching of undergraduates, interns and junior health workers ▪ To take a part in all academic activities in the department and also to join in postgraduate activities of the department such as Journal Club, clinical meetings and respective departmental unit's Grand Rounds <p>10. To portrait as a role model and demonstrate professional behaviours, including understanding one's professional limitations.</p> <p>11. To understand the importance and principles of scientific research skills and to emphasise the importance of an evidence-base for contemporary Obstetric and Gynaecological practice.</p> <p>12. To access and analyse scientific publications and research in the field of maternal Health Care.</p> <p>13. To present the developed research Project proposal with an appropriate topic in the field of Maternal Health for Zambia, to the Research Committee, with clearance by Research ethics Committee</p> |
| Course Content | <p>1. Anatomy</p> <ul style="list-style-type: none"> • Anatomy of the pelvis: The gross structure, ossification, the landmarks of the pelvic bones, common variants, different types of pelvises their associated joints. Shape and dimensions of the normal female pelvis. Relationships between the pelvic architecture, size and dimensions and reproductive function. Pelvic soft tissue. Gross and microscopic anatomy of all intra-pelvic soft tissues. It includes the vascular, lymphatic and the nerve supply. • Anatomy of the female reproductive system: Gross and microscopic anatomy, and the changes that occur during the menstrual cycle. The blood supply, nerve supply and lymphatic drainage. Relations to other structures and their importance. • Anatomy of female urinary system: Gross and microscopic structure of the kidneys, ureters, bladder, urethra, their blood and nerve supply and lymphatic drainage. Changes which occur in pregnancy and menopause. • Anatomy of the Abdomen: Topographical anatomy of all intra- abdominal organs. Structure, nerve and blood supply, and lymphatic drainage of the abdominal wall. • Anatomy of the breast: Its gross and microscopic anatomy in relation to its function, the blood supply, lymphatic drainage. The milk “let down reflex” • Anatomy of male reproductive system: Gross anatomy and |

histology of the testis, spermatogenesis. The necessary glands and their functions.

- Anatomy of endocrine system: Gross and microscopic anatomy of the hypothalamus, pituitary, thyroids, adrenals, ovaries, and testes, and other glands involved in reproduction e.g. the thalamus.
- Anatomy of nervous System: Major sensory and motor pathways within the central nervous system with particular references to the nervous connections of the pelvic organs.
- Embryology: Oogenesis and spermatogenesis. The fate of spermatozoa and ova in the male and female reproductive tracts respectively, and the importance thereof. Fertilisation, transport and implantation of the fertilized ovum, placentation and early embryogenesis. The development, structure, function and maturation (fate) of the human placenta. The development of foetal membranes. Formation, properties, function, volume at different gestations, and the fate of amniotic fluid. The general pattern and timing of organogenesis in the foetus. Effects of embryo toxic substances. The factors involved in the determination of the sex of a baby and the common abnormalities thereof.
- The foetus: The gross anatomy of the foetus with particular reference to the skull and cardiovascular system. The development of the urogenital system in the male and female. The foetal growth and maturation, and factors influencing them. The foetal-placental unit and its significance (i.e. as an endocrine gland) Oxygen and carbon dioxide transport into and out of, as well as within the foetus: the factors influencing that – Antenatal and in labour. The effects of uterine contractions upon foetal blood supply and oxygenation. The factors involved in the initiation and maintenance of neonatal respiration. The physiological adaptation and anatomical changes within the neonate to extra uterine life during the first few days, and factors controlling them.

2. Biochemistry

- Carbohydrate, protein and fat. Their general properties and an outline of the main metabolic pathways. Their main sources, and the roles in the body functions. Requirements in pregnancy and lactation.
- Enzymes: Their nature, functions and relation to intermediary metabolism.
- Iron metabolism, haemoglobin and haemopoietin, main sources of iron, types and demands in pregnancy and lactation

3. Cell biology and genetics

- The structure and function of the different components of a typical human cell.

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| | <ul style="list-style-type: none"> • The principles of a genetic code, and its determination • Mitosis and meiosis • Chromosomal constitution and anomalies of the karyotype • Mechanisms of inheritance of genetically determined abnormalities • Transfer of substances across the cell membranes of different tissues/organs. • Cellular features associated with damage, particularly those associated with ionising radiation, inflammation and trauma (e.g. surgical) <p>4. Essential of Biostatistics (Essentials of biostatistics, epidemiology and behavioural sciences).</p> <ul style="list-style-type: none"> • Basic biostatistical techniques. One should understand terms such as mean, median, mode, standard deviation and normal distribution, etc, their use and interpretation. • The principles of using tests of significance, relative risk, odds ratio, and the levels of probability which are normally accepted as demonstrating differences between groups of populations. • The different data analysis packages, techniques and when to use which. • General principles of identifying a topic for a research study and understand the various types of study designs, when and how to use which, the general principles of conducting research studies, analysing data, interpreting the results, and how such results can be presented, e.g. for publication, conference presentations, or dissertation/thesis. • Essential principles of human disease and factors which influence them. • Medical Sociology, cultural influence on reproductive health and health seeking behaviours. • Ethics as they relate to research on human subjects <p>5. Immunology</p> <ul style="list-style-type: none"> • The principles of immunology; properties of antigens, and antibodies; their reactions, and effects (results) thereof. • The development of immunity to infection, etc. – (active and passive). • The immunology of reproduction and pregnancy: the principles and types, including immunological pregnancy tests. • Rhesus and ABO incompatibility: their aetiology, effects and prevention. • Auto-immune diseases and reproduction. <p>6. Endocrinology</p> |
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| | <ul style="list-style-type: none"> • The hypothalamus and pituitary. The hormones of the hypothalamus: their nature and secretory control. Hormones of the anterior and posterior pituitary: their nature and control of secretion. The physiological functions and effects of these hormones. • Ovarian Hormones: Production and actions of ovarian steroidal hormones. An understanding of the basic pathways involved in their synthesis. A detailed knowledge of the process of menarche, menstruation and menopause, is necessary. • The adrenal gland: The action of ACTH, aldosterone, cortisone and catecholamines and an understanding of the metabolic pathways involved in the production of these hormones. Changes in pregnancy and their effects. • The Pancreas: Insulin, its nature, secretion and effects on carbohydrate metabolism. Changes in pregnancy and their effects. • The Thyroid: Control and secretion of thyroid hormones. The actions of thyroxine. Changes in pregnancy and their effects. • The Testis: The various hormones produced by the testes, their secretory control, metabolic processes, and effects. • The Placenta: (The foetal-placental unit – FPU). Detailed knowledge of the anatomic structure of the unit, the hormones produced, the metabolic pathways, precursors and their sources. The actions of the hormones. • Initiation of Parturition. Factors responsible for it. How all these endocrine glands inter-relate, especially in human reproductive functions and disease. <p>7. Microbiology/parasitology/virology/mycology.</p> <ul style="list-style-type: none"> • The principles of microbiology, parasitology, virology and mycology in broad outlines. • Behaviour and characteristics of the common bacteria, parasites, viruses, fungi and protozoa causing diseases of the female/male reproductive organs and their effects on pregnancy and fertility in general. • The microbiology of STI's in both females and males and how these affect reproductive health. • Common viruses (including HIV); protozoa, fungi, etc., which impact on reproduction or fertility. • The principles of infection control, asepsis, sterilization, disinfection, isolation and control of epidemics. • The principles underlying the use of chemotherapeutic, antimicrobial, antiviral, antifungal, antiparasitic agents. <p>8. Pathology</p> <ul style="list-style-type: none"> • The general pathological and histological patterns of trauma, inflammation, neoplasia and degeneration. |
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- The principles of human tissue response to various trauma, infection, surgery, etc., and factors influencing it.
- The normal process of wound healing and factors influencing it.
- Pathological features of wound healing and wound infection and predisposing factors.
- The pathogenesis and pathophysiology of gynaecological neoplasia both benign and malignant, and other common disease conditions.

9. Pharmacology

The principles underlying the mode of action and side effects of the following groups of drugs:

- Anaesthetics, analgesics and sedatives, tranquillisers, anticonvulsants.
- Chemotherapeutic agents: antibiotics, antiprastic, antifungal and antivirals.
- Cytotoxic agents.
- Drugs acting upon the sympathetic and parasympathetic nervous system.
- The principles underlying the metabolism, distribution and excretion of drugs and the changes in pregnancy and lactation
- The teratogenic dangers of drugs and other effects on the foetus, neonate and pregnant woman.
- The pharmacology of drugs acting upon the female reproductive system during and outside pregnancy.

10. Physiology

- Reproduction: All aspects of male and female reproductive physiology, much of which is covered under other headings within this syllabus.
- The following must include detailed knowledge of functional adaptation in pregnancy, parturition, the puerperium and lactation.
- Electrolyte and water metabolism.
- Acid –base balance
- Body responds to trauma with special reference to labour, obstetrical and gynaecological surgical trauma.
- Normal renal function.
- The cardiovascular system including knowledge of the control of blood pressure, heart rate and regional blood flow.
- Respiration, oxygen and carbon dioxide transport mechanisms.
- The working and arrangement of somatic and autonomic nervous system including the chemical transmission of nerve impulses.
- Digestive tract including absorption of different food

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| | <p>substances</p> <ul style="list-style-type: none"> • Carbohydrate, lipid and protein metabolism. <p>11. Nutrition:-</p> <ul style="list-style-type: none"> • The general principles of dietetics • The constitution of a normal diet • Particular requirements in pregnancy, and lactation. <p>12. Elementary biophysics</p> <ul style="list-style-type: none"> • The basic principles of: • Ionising radiation • Diagnostic radiology • Ultrasonography • CT Scan • Radiotherapy. <p>13. Health Care Ethics and Professionalism</p> <ul style="list-style-type: none"> ▪ Philosophical bases of healthcare ethics ▪ Principles and values in healthcare ethics ▪ International and national ethical codes. |
| Contact Hours: | <p>Lectures 1hr/week Tutorial 1hr/week Self-Directed Student-Centred Learning Activity 6 hr/week Clerkship Rotations (as per department's work schedule).</p> |
| Teaching Methods: | <p>The teaching methods may include, but not limited to, the following: expository lectures, tutorials, seminars, practical classes, skills laboratories, clinical demonstrations, clinical clerkships (bedside teaching, ward rounds, ambulatory care teaching, operating theatre experience, post-mortem, on-call duties), field and community based learning, and ICT supported learning experiences.</p> |
| Assessment Methods and Weighting: | <p>Log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, objective structured clinical examinations (OSCE), practical examinations, objective structured practical examinations (OSPE), Mini-clinical Examination (MiniCEX), Viva Voce,</p> <p>Annual Review of Competence Progression</p> <p>(a) Continuous Assessment - 40%</p> <p>(b) Final Examinations - 60%</p> <p>ZACOMS Administered Examinations Taken according to ZACOMS Examinations Schedule</p> |

CLINICAL RESEARCH METHODS

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| Course Name Code STP OBGY 2 | <i>CLINICAL RESEARCH METHODS</i> |
| Aim/Purpose: | This course is designed to provide the trainee with a basic understanding of clinical research through a stepwise overview of the research process. The course will introduce trainees to the concepts and principles of epidemiology, research methods, and biostatistics in the context of protocol development. It will equip trainees with the skills to design and implement a clinical research study, and analyze, interpret, and present their results. |
| Learning Outcomes: | <p>At the completion of the course students will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate understanding and utilizing basic epidemiologic principles for research. 2. Identify a research problem and formulate an appropriate question/hypothesis. 3. Identify an appropriate study design and necessary data for answering the question. 4. Gain familiarity with aspects of data management. 5. Identify and apply appropriate analytical methods to a data set, including computer-aided statistical analysis. 6. Synthesize and interpret study results. 7. Effectively present research methods and results both orally and in writing. |
| Course Content | <p>A. Epidemiology</p> <ol style="list-style-type: none"> 1. Introduction to epidemiology <ol style="list-style-type: none"> 1.1 Definitions of epidemiology 1.2 Common epidemiological terms 1.3 History of epidemiology 1.4 Application and importance 2. What is causation? <ol style="list-style-type: none"> 2.1 Cause and effect relationship 2.2 Causal pie model/Multicausality 2.3 Strength of causes 2.4 Causal criteria 3. Measure of Disease Occurrence <ol style="list-style-type: none"> 3.1 Incidence 3.2 Prevalence 3.3 Case fatality rates 3.4 Risk Ratio and Odds Ratio 3.5 Attributable risk/PAR 4. Types of epidemiological studies <ol style="list-style-type: none"> 4.1 Overview of the study designs 4.2 Cross-sectional studies 4.3 Cohort studies |

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| | <ul style="list-style-type: none"> 4.4 Case control 4.5 Clinical controlled trials 5. Bias and Confounders in study design <ul style="list-style-type: none"> 5.1 Definition of Bias and confounders 5.2 Types of errors (systematic and random) 5.3 Sources of bias in epidemiological studies 5.4 Properties of confounders 5.5 Control of bias and confounders 6. Data collection tools <ul style="list-style-type: none"> 6.1 Quantitative (open and closed questionnaire) 6.2 Qualitative (IDI, FGD) |
| | <p>B. Biostatistics</p> <ul style="list-style-type: none"> 1. Medical statistics <ul style="list-style-type: none"> 1.1 What is statistics? <ul style="list-style-type: none"> 1.2 Importance of statistics 1.3 Descriptive statistics 1.4 Inferential statistics 1.5 Variables 2. Central Tendency <ul style="list-style-type: none"> 2.1 What is central tendency? 2.2 Measures of central tendency 3. Variability <ul style="list-style-type: none"> 3.1 What is variability? 3.2 Measures of variability 3.3 Estimating variance 4. Graphing Distribution <ul style="list-style-type: none"> 4.1 Histogram 4.2 Bar charts 4.3 Line graphs 5. Probability <ul style="list-style-type: none"> 5.1 Basic Concepts 5.2 Non Conditional probability 5.3 Conditional probability 6. Normal Distribution <ul style="list-style-type: none"> 6.1 Varieties of normal distribution 6.2 Areas of normal distribution 6.3 Standard normal 7. Sampling Distribution <ul style="list-style-type: none"> 7.1 Sampling distribution of mean 7.2 Sampling distribution of difference between means 7.3 Sampling distribution of Pearson's r 7.4 Sampling distribution of a proportion 8. Estimation <ul style="list-style-type: none"> 8.1 Introduction 8.2 Degrees of Freedom 8.3 Characteristics of estimators |

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| | <ul style="list-style-type: none"> 9. Confidence Interval <ul style="list-style-type: none"> 9.1 confidence interval for the mean 9.2 Confidence interval for the difference between the means 9.3 Confidence interval for the Pearsons correlation 9.4 Confidence interval for the proportion 10. Logic of hypothesis testing <ul style="list-style-type: none"> 10.1 Significance testing 10.2 Type 1 and type 2 errors 10.3 One and two tailed test 10.4 Significance testing and confidence interval 11. Power <ul style="list-style-type: none"> 11.1 Power and sample size calculation 11.2 Factors affecting power 12. Predictions <ul style="list-style-type: none"> 12.1 Simple logistic regression 12.2 simple linear regression 13. ANOVA <ul style="list-style-type: none"> 13.1 ANOVAs designs 14. Chi-square <ul style="list-style-type: none"> 14.1 One way table 14.2 Contingency tables 15. Validity and reliability of diagnostic tests <ul style="list-style-type: none"> a. Sensitivity, Specificity, PPV, NPV b. ROC curves c. Inter observer variation |
| | <ul style="list-style-type: none"> C. Proposal Development <ul style="list-style-type: none"> 1. Identification of the research problem <ul style="list-style-type: none"> 1.1 Formulation of the Title 1.2 How to write the Introduction/Background 2. Review of literature <ul style="list-style-type: none"> 2.1 The main purpose of reviewing literature 2.2 How to search for literature 2.3 Reference and referencing 3. Justification/rationale 4. Statement of the problem and Hypothesis formulation 5. Objectives <ul style="list-style-type: none"> 5.1 Main objectives 5.2 Specific objectives 6. Methodology <ul style="list-style-type: none"> 6.1 Study design 6.2 Site 6.3 Sampling 6.4 Sample size |

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| | <ul style="list-style-type: none"> 6.5 Data collection techniques 7. Data management and Analysis <ul style="list-style-type: none"> 7.1 Introduction to SPSS 7.2 Entering Data in SPSS <ul style="list-style-type: none"> 7.2.1. Starting SPSS 7.2.2. Output viewer 7.2.3. Importing data from the other files 7.3 Data processing <ul style="list-style-type: none"> 7.3.1. Creating and defining data 7.3.2. Inserting cases and variables 7.3.3. Computing new variables 7.3.4. Recording variables 7.3.5. Sorting cases 7.3.6. Selecting cases 7.4 Data Summaries <ul style="list-style-type: none"> 7.4.1. Descriptive statistics 7.4.2. Frequencies 7.4.3. Cross-tabulations 7.5 Inferential statistics <ul style="list-style-type: none"> 7.5.1. Measure of association (statistics, chi-square linear correlation) 7.5.2. Testing for difference between two groups (t-tests) 7.5.3. One-way Analysis of Variation (ANOVA) 7.5.4. Nonparametric tests 7.5.5. Logistic regression 7.5.6. General Linear models 7.6 Displaying of Data <ul style="list-style-type: none"> 7.6.1. Tables 7.6.2. Bar Graphs 7.6.3. Scatter plots 7.6.4. Interactive charts 7.7 Data manipulation <ul style="list-style-type: none"> 7.7.1. Splitting files 7.7.2. Merging files 7.7.3. Aggregating data 8. Timeline 9. Research ethics 10. Budgeting 11. Presenting with PowerPoint 12. Techniques of writing a scientific paper |
| Contact Hours: | Lectures 1hr/week Tutorial 1hr/week Clerkship Rotations (as per department's work schedule). |
| Teaching | Lectures/ Seminars/discussions/tutorials and self-directed student-centred |

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| Methods: | learning. |
| Assessment Methods and Weighting: | <p>Log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, Viva Voce.</p> <p>Annual Review of Competence Progression</p> <p>(a) Continuous Assessment - 40%</p> <p>(b) Final Examinations - 60%</p> <p>ZACOMS Administered Examinations</p> <p>Taken according to ZACOMS Examinations Schedule</p> |

PART 2 MODULES FOR OBSTETRICS AND GYNAECOLOGY SPECIALTY TRAINING PROGRAMME

MANAGEMENT IN CLINICAL OBSTETRICS AND GYNAECOLOGY

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| Course Name Code STP OBGY 3 | MANAGEMENT IN CLINICAL OBSTETRICS AND GYNAECOLOGY |
| Aim/Purpose: | This Course aims at consolidating the clinical care and leadership skills in Obstetrics and Gynaecology in the trainees, and giving them more responsibility for teaching and supervising activities of staff at all levels, be role models by good example and be advocates for women's welfare and rights. This course also aims at providing mentorship and guidance to the trainee for the undertaking of their research project, collecting and analysing data, to develop scientific research skills, contribute to evidence based and quality Obstetrics and Gynaecology specialist care in Zambia. |
| Learning Outcomes: | <p>At the completion of the course students will be able to:</p> <ol style="list-style-type: none"> 1. To be fully proficient in applying relevant scientific principles and biostatistics to the care of women and children in obstetric and gynaecological health and disease. 2. To demonstrate general professional competencies including leadership and managerial skills, medical ethics and teamwork. 3. To plan and undertake independent scientific research activities, literature searches, critical appraisal of scientific literature, process and analyze statistics, interpret epidemiology data. 4. To function as senior registrars within the department with clinical duties including: <ul style="list-style-type: none"> ▪ Participation in daily ward work ▪ participating in outpatient clinics ▪ Taking on-calls at senior registrar level ▪ Supervision of interns and other junior health workers ▪ Teaching of undergraduates, interns and junior health workers 5. To take a full part in all academic activities in the department and also to join in postgraduate activities of the department such as Journal Club, clinical meetings and respective departmental units Grand Rounds. 6. To portrait as a role model and demonstrate professional behaviours. 7. To contribute to evidence-base knowledge for Obstetric and Gynaecology practice and improve the Health Systems in Zambia with regards to women and reproductive, holistic health care standards, including prevention and health promotion. 8. To collect and analyze scientific research data for their research project in the field of Obstetrics and Gynaecology health care |

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| <p>Course Content</p> | <ul style="list-style-type: none"> • Ante partum, post partum haemorrhage • Pre-eclampsia and eclampsia • PROMS, preterm labour • Previous caesarean section cases • Induction of labour using Misoprostol, or Oxytocin • Principals of dialysis, and immunosuppressant • Immunotherapy • Principals and application of surgical diathermy, lasers • The interpretation and investigation of disorders of cardio-respiratory function and renal function • Urinary tract and genital dysfunction caused by disease, injury and surgical intervention • Uses and pitfalls of ionising radiation • Principles of epidemiology and screening • Principals involved in the treatment of female reproductive dysfunction. <p>Clinical skills</p> <ul style="list-style-type: none"> • Obstetric and gynaecological ultrasound. • Uses and dangers and complications of ionising radiation including radiation protection of patients and users. • Use of post-mortem • Surgical skills • Resuscitation of the new born and other aspects of obstetric and new born care • Breech deliveries • Repair of third degree perineal tears • External cephalic version • Elective elective/emergency caesarean section, • The application of forceps, vacuum to achieve instrumental delivery • Postoperative Management • IVF management • Blood product usage • Antibiotic usage • Sterilisation • Thromboprophylaxis <p>This part includes attachment to specialities:</p> <p>1. SURGERY: Attachment for abdominal and female urological surgery. Knowledge and skills in these areas are important to any practicing obstetrician and gynaecologist. This is especially important and relevant in the practice within developing countries, like Zambia. Training will be conducted under the supervision of</p> |
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| | <p>General and/or Urological Surgeons.</p> <p>2. NEONATOLOGY. Each trainee will be attached to the Neonatal Unit under the supervision of Paediatrician(s). The aims are for the trainees to:-</p> <ul style="list-style-type: none"> ▪ Learn the common neonatal problems and relate them to maternal conditions, pregnancy, and intrapartum events. ▪ Learn the management of such conditions. ▪ Recognize the importance of preventive strategies, such as antenatal care, intrapartum care (active management of labour), fertility regulation. ▪ <p>3. ANAESTHESIA and INTENSIVE CARE UNIT (CRITICAL CARE) It is considered useful for the trainees to spend (1) one month in the anaesthetic department to acquire skills and experience in Obstetrics anaesthesia and analgesia. During this time the trainee will also be expected to rotate through the Intensive Care Unit (ICU) to gain experience in the management of critically ill patients requiring ICU management. This is important especially considering the various obstetric and gynaecological conditions, common in Zambia and the region, which may from time to time need intensive care unit management.</p> <p>4. CERVICAL CANCER SCREENING For cervical cancer screening trainees will rotate for 2 months in the cervical cancer screening clinic under supervision of the specialist to gain knowledge about the screening methods for cervical cancer. The trainees are also expected to gain knowledge in the use of colposcopy, cervicography,ablative procedures and LLETZ (large loop excision of the transformation zone).</p> <p>5. MANAGEMENT SKILLS COURSE</p> <ul style="list-style-type: none"> • Understand team management and leadership □ Human resource principles and staff management □ Business and financial management. • Administrative skills and time management • Collaboration with health care providers • Risk management • Understand health financing and planning • Project management • Relationships with professional bodies |
| <p>Contact Hours:</p> | <p>Lectures 1hr/week Tutorial 1hr/week Self-Directed Student-Centred Learning 6 hr/week</p> |

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| | Clerkship Rotations (as per department's work schedule). |
| Teaching Methods: | The teaching methods may include, but not limited to, the following: expository lectures, tutorials, seminars, practical classes, skills laboratories, clinical demonstrations, clinical clerkships (bedside teaching, ward rounds, ambulatory care teaching, operating theatre experience, post-mortem, on-call duties), field and community based learning, and ICT supported learning experiences. |
| Assessment Methods and Weighting: | <p>Log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, objective structured clinical examinations (OSCE), practical examinations, objective structured practical examinations (OSPE), Mini-clinical Examination (MiniCEX), Viva Voce,</p> <p>Annual Review of Competence Progression</p> <p>(a) Continuous Assessment - 40%</p> <p>(b) Final Examinations - 60%</p> <p>ZACOMS Administered Examinations</p> <p>Taken according to ZACOMS Examinations Schedule</p> |

Specialized Obstetrics and Gynaecology

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| Course Name Code STP OBGY 4 | <i>Specialized Obstetrics and Gynaecology</i> |
| Aim/Purpose: | This Course aims at further consolidating the specialist clinical care and leadership skills in Obstetrics and Gynaecology in the trainees, and giving them final responsibility for teaching and supervising activities of staff at all levels, be role models by good example and be advocates for women's health and rights. This course also aims at providing mentorship and guidance to the trainee for the finalizing of their research dissertation. |
| Learning Outcomes: | At the completion of the course students will be able to: <ol style="list-style-type: none"> 1. To function independently as a Fellow and provide high standard specialist care at all levels of the health care system, in line with National Health Policy. 2. To demonstrate excellent general professional competencies including leadership and managerial skills, medical ethics and teamwork. 3. To initiate, plan and undertake independent scientific research activities. 4. Communicate effectively and functions as a productive team member engaged in health care, research and education. 5. To take full part in all academic activities in the department, including supervision of other health professionals. 6. To portrait as a role model and demonstrate healthy Professional behaviours. 7. To contribute to evidence-base knowledge for Obstetrics and Gynaecology practice and improve the Health Systems in Zambia with regards to women and reproductive, holistic health care standards, including prevention and health promotion. |
| Course Content | <ol style="list-style-type: none"> 1. Obstetrics Specialist Clerkship 2. Gynaecology Specialist Clerkship |
| Contact Hours: | Lectures 1hr/week Tutorial 1hr/week Clerkship Rotations (as per department's work schedule). |
| Teaching Methods: | The teaching methods may include, but not limited to, the following: expository lectures, tutorials, seminars, practical classes, skills laboratories, clinical demonstrations, clinical clerkships (bedside teaching, ward rounds, ambulatory care teaching, operating theatre experience, post-mortem, on-call duties), field and community based learning, and ICT supported learning experiences. |
| Assessment Methods and Weighting: | Log of experiences and procedures completed, case reports, portfolios, project reports, multiple choice questions, essay questions, short answer questions, modified essay questions, short and long cases, objective |

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| | <p>structured clinical examinations (OSCE), practical examinations, objective structured practical examinations (OSPE), Mini-clinical Examination (MiniCEX), Viva Voce,</p> <p>Annual Review of Competence Progression</p> <p>(a) Continuous Assessment - 40%</p> <p>(b) Final Examinations - 60%</p> <p>ZACOMS Administered Examinations</p> <p>Taken according to ZACOMS Examinations Schedule</p> |
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INDICATIVE RESOURCES

Bennett P, Williamson C (2010). Basic Science in Obstetrics and Gynaecology: A Textbook for MRCOG Part 1. Churchill Livingstone (4th edition). ISBN10:0443102813

Goering R V, H M, Zuckerman M, Wakelin D, Roitt I, Mims C and Chiodini P (2007). Mims' Medical Microbiology (4th edition). Mosby. . ISBN: 978-0-32304475-2 .

Murray R, Granner D, Mayes P and Rodwell V (2006). Harper's Illustrated Biochemistry. McGraw-Hill. ISBN: 978-0-07-146197-9

Sinnatamby C S (2006). Last's Anatomy - Regional and Applied (11th edition.) Churchill. ISBN: 978-0-443-10033-8

Schoenwolf G C, Bleyl B S, Brauer P R and Francis-West P H. (2008). Larsen's Human Embryology (4th edition). Churchill. ISBN: 978-0-443-06811-9

Underwood JCE (2009).General and Systemic Pathology (5th edition). Churchill. ISBN: 978-0-443-06888-

Hulley SB, Cummings SR, Browner WS, et al. Designing Clinical Research. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2007.

Kenneth J Rothman: Epidemiology: An introduction Oxford University press 2002

Bernard Rosner. The Fundamentals of Biostatistics. Duxbury Press, Belmont CA 5th edition 1995

Daniels, (1991). Biostatistics: A Foundation for Analysis in Health Sciences (6th Edition). John Wiley and Sons Inc, New York.

Browner WS. Publishing and Presenting Clinical Research. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2006.

Cunningham F.G, Hauth J.C, Kenneth J. L, Larry Gilstrap III, Steven L. B, Wenstrom K D. Williams Obstetrics - 22nd Ed. (2005). McGraw-Hill Medical Publishing Division. ISBN: 0-07-141315-4

Chamberlain G, Philip J. S (2002). Turnbull's Obstetrics-3RD Edition. Churchill Livingstone ISBN 13: 9780443063657

Edmonds K (2007). Dewhurst's Textbook of Obstetrics and Gynaecology, 7th Edition. Wiley-Blackwell. ISBN: 978-1-4051-3355-5

David L, Jonathan S. B (2007).Novak's Gynaecology 13th edition. Philadelphia: Williams. & Wilkins ISBN-10: 0-7817-6805-5

Family Planning Methods and Practice: Africa (2010) USA. Dept. of Health Atlanta Superhot – Clinical Endocrinology.

John A. R (2008) TeLinde's Operative Gynaecology (Te Linde's Operative Gynecology) 10th Edition. Lippincott Williams & Wilkins. ISBN-10: 0781772346

British Journal of Obstetrics and Gynaecology

American Journal of Obstetrics and Gynaecology <http://www.obgyn.net/educational-tutorials>

Gabbe S G, Niebyl J R, Simpson J (2007).Obstetrics: Normal and Problem Pregnancy _5th Edition. Churchill Livingstone. ISBN: 0443069301