Diploma of Medical Ultrasonography (DMU) (Obstetric)

Syllabus
INTRODUCTION

This syllabus is divided into two parts. Part 1 forms the foundation for Part 2. Part 2 continues with the acquisition of knowledge and concentrates on the acquisition of skills.

i. Philosophy/Perspective
Diagnostic ultrasound is firmly established in medical practice. Ultrasound facilitates decisions regarding patient management and the sonographer plays a significant role in the diagnostic team. The training and assessment processes need to reflect the responsibilities required of the sonographer.

ii. Theory And Training
As health care professionals, the sonographer’s role is to perform imaging to a high standard and to provide accurate information to aid in the correct management of the patient. Vital to the performance of a high standard of practice are several factors including:

- The assimilation of factual knowledge and understanding of relevant physical principles of ultrasound, instrumentation, anatomy, physiology, pathology and, where applicable, therapeutic intervention
- Acquisition and understanding of the required technical skills
- Acquisition and appropriate use of high-level oral and written communication skills
- Acquisition of interpersonal skills necessary for the sonographer to function in a professional, competent, caring and compassionate manner

Clinical supervision is provided by the practice in which the sonographer is working. It is recognised that some trainees may not be exposed to the broad range of ultrasound applications in one institution. Where there are local limitations, experience should be sought elsewhere. Participation in day-to-day reporting, clinical conferences and scientific meetings is advised. Emphasis is placed on current knowledge and skills. A commitment to continuing education is a professional responsibility.

iii. Responsibilities
In the delivery of a high quality professional service the responsibilities of the sonographer include:

- Clear communication with the patient and other medical staff
- Preparation of the patient for the examination
- An ability to obtain informed consent
- Confidentiality with patient information
- Care and comfort of the patient during the examination
- Familiarity with emergency procedures
- Strict adherence to infection control practice and knowledge of current standards
- Safe work practices in accordance with current standards of occupational health and safety considerations
- Knowledge of bioeffects
- Care and maintenance of equipment
- Acquisition of appropriate information to be presented to the medical practitioner for consideration and reporting
- Awareness of professional, legal and ethical aspects of sonographic practice
- Sensitivity to cultural differences
- Quality control of equipment and practical and administrative details
- A commitment to continuing education

ASUM policies, statements and clinical protocols are applicable where appropriate in the above points.
iv. **Overview Of The DMU (Obstetric)**

The Diploma of Medical Ultrasonography (Obstetric) is designed to assess the candidate’s knowledge and competencies in:

- The theory and application of the principles of ultrasound physics and instrumentation
- Relevant embryology, anatomy, physiology and pathology
- Obstetric scanning techniques, including all trimesters of pregnancy
- Scanning techniques and procedures used in complicated pregnancies
- The use of advanced techniques, such as Doppler, in obstetrics
- Gynaecological scanning techniques, including fertility applications

The DMU (Obstetric) is also designed to assess the candidate’s knowledge of the principles, major applications, limitations and advantages/disadvantages of ultrasound techniques in:

- Commonly used scanning techniques in the neonate, including:
  - the neonatal head
  - hip
  - abdomen
- Scanning techniques in the assessment of the adult abdomen, including the urinary tract

The DMU (Obstetric) is also designed to assess the candidate’s knowledge of other important aspects of sonographic practice such as:

- Professional, legal and ethical aspects of sonographic practice
- Quality control principles and practices
- Safe work principles and practices.

**PART 1 DMU (Obstetric) SYLLABUS**

a. **Anatomy and Physiology**

Concepts and principles from the biophysical sciences underpin the theoretical basis of sonography practice. This section forms the foundation for the study of the structure and function of the human body. In order to be successful in the DMU assessments candidates are expected to demonstrate a detailed understanding of the gross anatomy of the human body with an emphasis on those organ systems and structures that can be visualized using ultrasound.

An understanding of basic physiology is also required and candidates are expected to be able to demonstrate an understanding of the relationship between the anatomical features and basic physiology of the major organs and systems that can be assessed by ultrasound.

Changes which may occur in physiology from the fetal period to childhood to adulthood should also be understood. The relational anatomy between adjacent organs and structures must be understood. The following are major anatomical areas and organs about which candidates are expected to demonstrate a detailed knowledge of anatomy and physiology. Within each of these anatomical areas, and as applicable, candidates are expected to demonstrate detailed understanding of:

- Gross anatomical structure
- Surface anatomy and related anatomy to surrounding organs and structures
- Normal size ranges
- Common anatomical variants
- The major arterial, venous and lymphatic systems of each organ
- Basic physiology
i. Abdominal Structures
- Liver, including vascular structures
- Biliary tract (gallbladder, cystic duct, intra and extra hepatic bile ducts)
- Pancreas
- Spleen
- Urinary tract (kidneys, ureters, bladder and urethra)
- Adrenal glands
- Aorta and its major branches
- Portal venous system
- Inferior vena cava (IVC) and its major tributaries
- Retroperitoneum and the concept of the peritoneal space
- The alimentary system

ii. The Female Pelvis
- Uterus, cervix and vagina, including physiology of the menstrual cycle
- Ovaries, including physiology of the ovarian cycle
- Major ligaments and muscles of the pelvis

iii. Head, Brain and Central Nervous System (CNS) (as applicable to fetal and paediatric sonography)

The Cardiovascular System
Within the cardiovascular system candidates should concentrate particularly on those structures and areas that are commonly examined using diagnostic ultrasound techniques in obstetrics and gynaecology such as:
- The heart, particularly as applicable to the fetus
- The major structure of the arterial, venous and lymphatic systems

b. Embryology
An understanding of the major stages of embryological development is essential in understanding normal gross anatomy and the development of the fetus. Candidates are expected to demonstrate a detailed knowledge and understanding of the major stages of development of the fetus and the fetal environment, with an emphasis on:
- The processes from ovulation to the development of the blastocyst and implantation (the first week of development)
- The major processes that occur during the embryonic period (from approximately 6 to 10 weeks amenorrhea), including a detailed understanding of:
  - the chorionic and amniotic membranes and cavities
  - placental development.
- The variations in development of the membranes, in association with multiple pregnancies, must be understood along with the terminology for the classification of multiple pregnancies based on chorionicity and amnionicity
- A basic knowledge of development of the following organs and structures throughout the embryonic period (approximately 6 to 10 weeks amenorrhea) and the fetal period (approximately 11 weeks to term) is required:
  - placenta and umbilical cord
  - cardiovascular system
  - body cavities and serous membranes
  - gastrointestinal system
  - major organs of the abdomen, including: 
    - liver
c. General Pathology
Candidates are expected to demonstrate an understanding of the general principles of pathological processes, in particular the processes of:

- Cellular injury, repair and adaptation
- Inflammation
- Atherosclerosis, thrombosis, embolism and infarction
- Fluid production and haemodynamic derangements
- Genetic disorders (basic principles only)
- Disorders of immunity (basic concepts only)
- Neoplasia, including the:
  - development of neoplasms
  - classification of neoplasms in terms of cellular types and benign/malignant potential
- Mechanism for the spread of malignancies

d. Obstetrics (overview of anatomy and physiology)
The field of obstetric ultrasound requires a detailed understanding of fetal anatomy and fetal development throughout gestation. Candidates are expected to demonstrate a detailed understanding of the anatomy and development of those fetal organs and systems as described in Section b. Embryology.

Additionally candidates are expected to demonstrate an understanding of:

- The production of hormones during pregnancy, including the variations in hormone levels throughout pregnancy and immediate post-partum period
- Major maternal physiological changes during pregnancy
- Normal fetal growth and development
- Normal delivery and puerperium
- Placenta - basic structure and function
- Amniotic fluid - production, circulation and benefits of adequate amniotic fluid volumes

NOTE: It is each candidate’s responsibility to ensure that they have covered all the areas in this syllabus using all the resources available to them.

PART 2 DMU (Obstetric) SYLLABUS

a. Technique: General Considerations
The sonographer will be expected to attain competence in the performance and interpretation of diagnostic ultrasound examinations. Along with a review of Part 1 material, emphasis will be placed on application of this knowledge and its integration with the development of technical skills, image interpretation and patient care. This will involve reviewing embryology, anatomy, pathology and physiology, and understanding the
technical requirements necessary to produce ultrasound images that display normal and abnormal anatomy and pathology.

For any examination, the sonographer will be expected to:
- Understand the clinical indication/s for the examination and understand any impact it/they may have on the conduct of the examination
- Assess the suitability of ultrasound to answer a particular question
- Recognise any limitations presented by:
  - patient condition/habitus
  - equipment available
  - skills, knowledge and experience of the sonographer
- Explain the procedure to the patient and obtain informed consent to proceed with the examination (may be verbal consent where appropriate)
- Be aware of the needs of the patient during the examination
- Select appropriate equipment and transducer (linear/sector etc), appropriate frequency and transducer size
- Optimise technical factors in order to obtain the best possible image quality
- Recognise artifacts and their causes and when applicable be able to reduce artifacts.
- Optimise photographic factors to preserve image detail
- Systematically survey and document organs/structures with attention to features of:
  - size
  - position
  - shape/contour
  - echotexture
  - anatomical relationships
  - change in normal architecture
  - pathological processes
- Recognise and describe the ultrasound appearances of normal and abnormal anatomy, physiology and pathology
- Perform measurements as applicable and in accordance with recognised protocols
- Extend the examination to other areas as may be indicated by findings during the examination
- Select suitable images to record relevant anatomy and pathology
- Comply with ASUM’s “Policy on Ultrasound Services” and other relevant policies and protocols
- Present, explain and discuss the sonographic information for reporting
- Label recorded images appropriately
- Use equipment safely
- Adhere to applicable ASUM clinical protocols listed on the ASUM web site

b. Detailed Sonographic Assessment in Gynaecology
The purpose of a diagnostic ultrasound examination is to assess an organ or organ system in order to identify, record and allow appropriate reporting of normal and abnormal findings. The sonographer must have detailed knowledge of the following when examining any organ or organ system:
- Normal anatomy and physiology
- Normal sonographic appearances
- Sonographic appearances of common normal variants
- Normal ranges of standard measurements and standard measurement protocols
- Major pathologies applicable to an organ or organ system and their possible clinical presentations and sonographic appearances
- Appreciation of the more rarely seen or uncommon pathologies which may be associated with an organ or organ system
• Principles of application of advanced techniques such as the use of Doppler ultrasound or contrast agents
• The role, advantages, disadvantages and applications of complementary techniques, including invasive ultrasound guided therapeutic techniques
• How to find further information when required.

The following listing of major pathologies is meant as a guide to the predominant range of pathologies that an obstetric/gynaecological sonographer may expect to encounter when examining a particular organ or organ system. The list is not exhaustive and candidates are expected to read widely in the particular area of study.

The study of pathological processes that may be encountered in any organ or organ system should be approached systematically and would, in most cases, include consideration of the following:
• Congenital abnormalities/anomalies
• Acquired processes such as:
  o inflammation
  o infection
  o effects of trauma
  o neoplasia
  o degenerative processes
  o vascular disorders
  o metabolic disorders

The following is a list of common clinical and pathological conditions that may be found in the organs of the female pelvis that an obstetric sonographer is expected to have detailed knowledge of and be able to examine adequately. It is intended as a guide and is not a comprehensive list.

i. Uterus, cervix and vagina
• Congenital abnormalities
• Normal changes that occur during the menstrual cycle
• Leiomyoma (fibroids)
• Leiomyosarcoma
• Adenomyosis
• Arteriovenous malformation
• Postmenopausal endometrium
• Hematometrocolpos
• Endometrial hyperplasia
• Endometrial polyps
• Endometrial carcinoma
• Endometritis
• Intrauterine contraceptive devices
• Nabothian cysts

ii. Ovaries
Recognise the normal changes that occur during the menstrual cycle
• Postmenopausal ovary
• Functional cysts
• Haemorrhagic cysts
• Parovarian cysts
• Endometriosis
• Polycystic ovarian syndrome
• Ovarian torsion
• Hyperstimulation
• Ovarian cancer
• Germ cell tumours (cystic teratoma)
• Benign and malignant neoplasia
• Pelvic inflammatory disease
• Disease processes involving the fallopian tubes
• Postoperative pelvic mass
• Retained products of conception

iii. Infertility assessment and treatment
Candidates are expected to be able to demonstrate an understanding of the:
• Role of ultrasound in the investigation of infertility
• Use of ultrasound to monitor fertility treatment, including the monitoring of ovaries and the endometrium during spontaneous and stimulated cycles
• Principles, applications, limitations, advantages and disadvantages of advanced techniques for the assessment of the uterus and fallopian tubes such as hysterosalpingosonography, using saline and/or contrast agents

c. Obstetrics
In order to be successful candidates will need to demonstrate a high level of knowledge and skill in the area of obstetric ultrasound. Candidates are strongly advised to familiarise themselves with the ASUM policies on obstetric scanning protocols.

Candidates will be expected to demonstrate skill in the performance of a “normal” obstetric scan, as well as a detailed knowledge of possible anomalies that may be encountered at the various stages of pregnancy and in the post-partum period.

Candidates will be expected to demonstrate knowledge of, and competence in performing, the following fetal measurements at the appropriate stage of gestation:
• Crown-rump length (CRL)
• Mean sac diameter (MSD)
• bi-parietal diameter (BPD)
• head circumference (HC)
• occipito frontal diameter (OFD) (where relevant)
• cerebellar diameter
• Cisterna Magna
• Nuchal fold
• Cerebral ventricles
  o Nasal bone
• Long bones (especially femur and humerus)
• Abdominal circumference (AC)
• Fetal weight estimation
• Other organs when required (ie kidney, liver and lung)

i. First Trimester
Candidates are expected to demonstrate a detailed understanding of the application and requirements of an ultrasound examination and possible normal and abnormal findings in the first trimester of pregnancy.

Emphasis should be placed on, but not limited to, the following areas of application:
• Early diagnosis and dating of pregnancy
• Early pregnancy loss and threatened miscarriage
• Possible non-viable pregnancy, including trophoblastic disease
• Suspected ectopic pregnancy
• The 11-14 week scan, including nuchal translucency assessment and early fetal anatomical survey
• Assessment of twins and chorionicity

Candidates are expected to demonstrate an understanding of the principles of risk assessment and the use of biochemistry testing in conjunction with the nuchal translucency scan.

ii. **Mid trimester scan**
Candidates will be expected to have detailed knowledge of, and be able to demonstrate competence in performing, an 18-20 week morphology scan as described in the *ASUM Guidelines for the Mid Trimester Obstetric Scan*. Additionally, candidates will be expected to have a detailed knowledge of possible abnormalities that may be encountered during a routine 18-20 week obstetric scan.

The following list is not comprehensive, but is designed to emphasize those areas where candidates would be expected to be able to demonstrate an understanding of the abnormality and its possible ultrasound appearances:

- Diaphragmatic hernia
- Pulmonary hypoplasia
- Cystic adenomatoid malformations
- Pulmonary sequestration
- Cystic hygroma
- Oesophageal atresia
- Duodenal atresia
- Renal
  - bilateral renal agenesis
  - hydronephrosis/pyelectasia, including its association with aneuploidy
  - pyelectasis, including its association with aneuploidy
  - ureteropelvic junction obstruction
  - ureterovesical junction obstruction
  - duplication anomalies and ureteroceles
  - urethral obstruction
  - multicystic dysplastic kidney
  - obstructive cystic renal dysplasia
  - autosomal recessive (infantile) polycystic kidney disease
- Adrenal mass
- Fetal heart anomalies
  - atrial septal defect
  - ventricular septal defect
  - Ebstein’s Anomaly
  - hypoplastic right heart syndrome
  - hypoplastic left heart syndrome
  - tetralogy of Fallot
  - transposition of the great arteries
  - coarctation of aorta
  - tachycardia
  - bradycardia
- Fetal brain and central nervous system
  - anencephaly/acrania
  - encephalocele
  - spina bifida
  - holoprosencephaly
In addition to an assessment of the fetus for potential anomalies, the candidate is expected to demonstrate an understanding of, and competence in assessing, the following aspects of the fetal environment:

- **Placenta**
  - placenta praevia
  - definition of a low-lying placenta and its significance at the various stages of pregnancy
  - placental abruption
  - submembranous hematoma
  - hydatidiform mole/choriocarcinoma
  - variations in placental structure

- **Premature rupture of membranes**

- **Amniotic fluid**
  - amniotic fluid volume
  - amniotic fluid index
  - oligohydramnios
  - polyhydramnios

**Cervix incompetence and preterm labour**
- Assessment of length, funnelling and dilatation (including the use of trans-labial or vaginal scan)

**Co-existing gynaecological conditions**
- Congenital uterine anomalies
- Ovarian cysts/neoplasia

**Prenatal invasive diagnostic and therapeutic procedures**
Candidates are expected to have a general understanding of the role of ultrasound in the conduct of, and the basic principles of, prenatal invasive processes such as:
- Amniocentesis
- Chorionic villus sampling
- Fetal blood sampling
- Therapeutic interventions

**Multiple pregnancy**
Candidates are expected to have an understanding of the role of ultrasound in the assessment of multiple pregnancies including the following aspects:
• Techniques for the determination of amnionicity and chorionicity
• Complications of multiple pregnancies
• Twin to Twin Transfusion (TTT) Syndrome
• Complications specific to monoamniotic twins
• Conjoined twins

iii. Third trimester assessment
Candidates are expected to have a detailed understanding of the applications and role of ultrasound in the assessment of the pregnancy in the third trimester. Such an assessment will include appropriate:
  o biometry
  o fetal anatomical assessment
  o assessment of the placenta, amniotic fluid and cervix

Additionally, sonographic techniques to assess the following conditions are expected to be understood:

Fetal growth anomalies
• Intrauterine growth restriction
• Symmetrical growth restriction
• Asymmetrical growth restriction
• Macrosomic growth

Fetal well-being
• Biophysical profile
• Assessment of fetal hemodynamics such as the umbilical artery flow and middle cerebral artery flow using Doppler ultrasound. Candidates are also expected to understand the principles of Doppler assessment of the ductus venosus
• Assessment of maternal haemodynamics including the use of Doppler ultrasound to assess the maternal uterine arteries in the assessment of pre-eclampsia

Maternal diseases and complications of pregnancy
Candidates are expected to have an understanding of the possible maternal diseases which may impact on the pregnancy and the possible effects of such diseases/conditions. Such conditions include:
• Diabetes
• Hypertension
• Pre-eclampsia
• Rhesus and other antibody incompatibility

Candidates should also have an understanding of other possible maternal complications of pregnancy, and the post-partum period and the role of ultrasound and other diagnostic tests in the assessment of the complications. Some of the possible complications include:
• Retained products of conception
• Endometritis post-partum
• Deep vein thrombosis
• Portal vein thrombosis
• Renal failure
• Cardiomyopathy

d. Other Required Areas of Sonographic Assessment
The following areas of general ultrasound require obstetric candidates to be able to demonstrate an understanding of the main principles involved in the sonographic examination. Within these areas candidates should understand the:
• Major areas of application of ultrasound techniques
• Specific equipment /technical requirements for the applicable techniques
• Anatomy, physiology and pathology applicable to the major areas of application
• Normal sonographic appearances of the areas of common application
• Sonographic appearances of the common abnormalities expected to be detected
• Limitations of the ultrasound techniques in the major areas of application and the role of other complementary techniques

The study of pathological processes that may be encountered in any organ or organ system should be approached systematically and would, in most cases, include consideration of the following:
• Congenital abnormalities/anomalies
• Acquired processes such as:
  o inflammation
  o infection
  o effects of trauma
  o neoplasia
  o degenerative processes
  o vascular disorders
  o metabolic disorders

The following is a list of common clinical and pathological conditions that may be found in those organs and organ systems that an obstetric sonographer is expected to have knowledge of. It is intended as a guide and is not comprehensive.

Liver
• Congenital anomalies
  o liver cyst
  o adult polycystic disease
• Infectious Diseases
  o viral (hepatitis)
  o bacterial
  o fungal (candidiasis)
  o parasitic (hydatid disease, schistosomiasis)
• Jaundice, including types and causes
• Metabolic disorders
  o fatty liver
  o cirrhosis
• Vascular
  o portal hypertension
  o portal vein thrombosis
  o Budd-Chiari syndrome
• Benign neoplasms
  o hemangioma
  o focal nodular hyperplasia
  o adenoma
  o lipoma
• Malignant neoplasms
  o hepatocellular carcinoma
  o metastatic disease

Spleen
• Splenomegaly
• Portal hypertension effects
• Cysts
• Solid masses
• Neoplasia
  o benign
  o malignant
• Trauma and its effects
• Congenital anomalies
  o splenunculi
  o asplenia
  o polysplenia

Gallbladder and Bile Ducts
• Congenital variations
• Cholelithiasis
• Cholecystitis
• Polyps
• Adenomyomatosis
• Carcinoma
• Dilated bile ducts /obstruction
• Choledocholithiasis
• Sclerosing cholangitis
• Cholangiocarcinoma
• Congenital (choledochal cyst)

Pancreas
• Congenital anomalies
  o cysts
  o cystic fibrosis
  o annular pancreas
• Pancreatitis
  o acute
  o chronic
• Neoplasms
  o adenocarcinoma
  o cystic neoplasms
  o islet-cell tumours
  o non-islet-cell tumours

Urinary Tract
• Congenital anomalies such as:
  o fetal lobulation
  o compensatory hypertrophy
  o ectopia
  o Horseshoe kidney
  o renal agenesis
• Duplex collecting system, ureterocoele
  o ureteropelvic junction obstruction
  o congenital megacalycyces
  o congenital megaureters
• Infections
  o acute pyelonephritis
  o renal and perinephric abscess
  o chronic pyelonephritis
  o tuberculosis
- Renal calculi
- Nephrocalcinosis
- Tumours of the urinary tract
  - renal cell carcinoma
  - transitional cell carcinoma
  - angiomyolipoma
  - lymphoma
  - metastases
- Renal cystic disease
  - cortical cysts (simple and complex)
  - parapelvic cysts
  - medullary sponge kidney
  - medullary cystic disease
  - polycystic kidney disease
  - autosomal dominant
  - autosomal recessive
  - multicystic dysplastic kidney
  - acquired cystic kidney disease
- Traumatic effects
- Acute tubular necrosis
- Bladder diverticular

**Adrenal Gland**
- Adenoma
- Adrenal cortical cancer
- Metastases
- Cysts
- Haemorrhage

**Retroperitoneum**
- Lymph nodes (lymphadenopathy)
- Abdominal aorta
  - Calcification
  - Aneurysm
  - thrombosis
- Inferior vena cava (thrombosis)

**Peritoneum and the diaphragm**
- Peritoneum
  - ascites
- Diaphragm
  - pleural effusion

**Paediatrics**
Listed are conditions that especially pertain to newborns in the neonatal period. Candidates are expected to have an understanding of the pathological process and the role of ultrasound in assessing the:

i. **Neonatal Head**
- Chiari malformations
- Agenesis of the corpus callosum
- Dandy-Walker malformation
- Holoprosencephaly
- Hydrocephalus
- Germinal matrix haemorrhage
- Intraventricular haemorrhage and gradings
- Periventricular leukomalacia
- Porencephalic cyst
- Subdural and epidural haematomas
- Congenital infections

ii. Spinal Canal
- Tethered spinal cord
- Diastematomyelia
- Myelomeningocele

iii. Liver
- Choledochal cyst
- Biliary atresia
- Hepatoblastoma

iv. Kidney and Adrenal Glands
- Ureteropelvic junction obstruction
- Bladder outlet obstruction
- Prune-belly syndrome
- Autosomal recessive polycystic kidney disease
- Autosomal dominant polycystic kidney disease
- Multicystic renal dysplasia
- Wilms tumour
- Neuroblastoma

v. Gastrointestinal Tract
- Hypertrophic pyloric stenosis
- Congenital duodenal obstruction
- Intussusception

vi. Paediatric Hip
- Developmental dislocation and dysplasia of the hip

e. Professional, Legal and Ethical Aspects of Sonographic Practice

The role of the sonographer is diverse and complex and so DMU candidates are required to have an understanding of their responsibilities to the:
  - patient
  - employer
  - regulating bodies

Candidates must also understand and adopt practices that conform to the standards of their profession and have due consideration for the legal and ethical issues which regulate their actions as a health care professional.

Sonographers must be aware of their legal responsibilities and of ethical issues that may occur during their practice as a sonographer. The candidate is expected to have an understanding about a range of legal issues including:
  - consent
    - verbal
    - written
Sonographers must be aware of:
- published standards of practice
- the process of sonographer accreditation
- the value of membership to appropriate professional bodies

The candidate is also expected to have a good knowledge of these workplace issues:
- workplace health and safety including ergonomics
- emergency procedures
- infection control
  - policies
  - procedures
- quality control of equipment
- administrative processes
- indemnity insurance

The candidate must also have an understanding of the following ethical aspects of sonography:
- basic bioethical principles and how they apply to sonography
- autonomy
- non-maleficecence
- beneficience
- justice
- veracity
- how to resolve ethical dilemmas and conflict
- the relevance of bioethics in the practice of sonography and in particular in:
  - obstetrics and gynaecology
  - the use of new technologies

In order to be able to critically analyse information and understand their responsibilities you will need to:
- read widely from relevant publications
- attend conferences and seminars
- participate in continuing education programs

NOTE: It is each candidate’s responsibility to ensure that they have covered all the areas in this syllabus using all the resources available to them.