

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
24 Douglas Street
GLASGOW G2 7NQ**

NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 7311031 **-Session-1991-92**
-Superclass- RH

-Title- **FOETAL DEVELOPMENT AND HUMAN GROWTH**
(x¹/₂)

-DESCRIPTION-

Purpose This module provides students with the means of extending their knowledge of human reproduction to include the details of embryonic development and post parturition growth to adulthood.

The module is suitable for inclusion in Biology, Human Biology, or Caring programmes and offered in conjunction with other Stage 2 Biology modules it could be a preparation for Higher Education.

Preferred Entry Level 7310051 Introducing The Human Body,
7310041 Introducing Reproduction or Standard Grade Biology at Grade 3.

Outcomes The student should:

1. describe the process of gametogenesis;
2. relate the growth and development of the foetus to its hormonal control;
3. relate birth and lactation to their hormonal control;
4. describe growth and development after birth.

Assessment Procedures Acceptable performance in this module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.

The following abbreviations are used below:

PC Performance Criteria
IA Instrument of Assessment

Note: The Outcomes and PCs are mandatory and cannot be altered. The IA may be altered by arrangement with SQA. (Where a range of performance is indicated, this should be regarded as an extension of the PCs and is therefore mandatory.)

OUTCOME 1 DESCRIBE THE PROCESS OF GAMETOGENESIS

- PCs
- (a) The description of gametogenesis is correct with respect to:
- (i) meiotic cell division;
 - (ii) location within tissues;
 - (iii) structure of male and female gametes.
- (b) The description of hormonal control of gametogenesis is correct with respect to:
- (i) oogenesis;
 - (ii) spermatogenesis.

IA Objective Questions

9 objective questions to assess the students ability to describe the process of gametogenesis.

The questions should be allocated as follows:

- | | | | |
|-----|------|-------------|-------------|
| PC | (a) | (i) | 1 question |
| | | (ii) | 2 questions |
| | | (iii) | 2 questions |
| (b) | (i) | 2 questions | |
| | (ii) | 2 questions | |

Several types of objective questions would be suitable for the above assessment.

Satisfactory achievement of the Outcome will be demonstrated by the student providing the correct responses to all 9 questions.

OUTCOME 2 RELATE THE GROWTH AND DEVELOPMENT OF THE FOETUS TO ITS HORMONAL CONTROL

- PCs
- (a) The description of the growth and development of the foetus is correct with respect to:
- (i) the process of fertilisation;
 - (ii) cleavage;
 - (iii) implantation;
 - (iv) differentiation;

- (v) exchange between foetal and maternal circulation.
- (b) The interpretation of the growth and development of the foetus in relation to its hormonal control is correct with respect to:
 - (i) the role of the pituitary;
 - (ii) the role of ovary;
 - (iii) the role of the placenta.

IA Structured Questions

2 structured questions to assess the student's ability to relate the growth and development of the foetus to its hormonal control.

The questions should be allocated one for each Performance Criteria. Each part of the Performance Criteria must be assessed at least once.

Satisfactory achievement of the Outcome will be demonstrated by the student achieving all the Performance Criteria.

OUTCOME 3 RELATE BIRTH AND LACTATION TO THEIR HORMONAL CONTROL

PCs

- (a) The description of birth is correct in terms of:
 - (i) the stages involved;
 - (ii) changes in foetal circulation.
- (b) The description of lactation is correct in terms of:
 - (i) breast structure;
 - (ii) suckling;
 - (iii) colostrum.
- (c) The relation of birth and lactation to their hormonal control is correct with respect to:
 - (i) the role of the pituitary;
 - (ii) the role of the placenta.

IA Structured Questions

2 structured questions to assess the student's ability to relate birth and lactation to their hormonal control.

The questions should be allocated as follows:

- 1 question on birth
- 1 question on lactation

Each part of the Performance Criteria must be assessed at least once within the 2 questions.

Satisfactory achievement of the Outcome will be demonstrated by the student achieving all the Performance Criteria.

OUTCOME 4 DESCRIBE GROWTH AND DEVELOPMENT AFTER BIRTH

- PCs
- (a) The description of the changes in body proportions from birth to adulthood is correct.
 - (b) The description of the hormonal control of growth and development is correct in terms of:
 - (i) the role of the pituitary;
 - (ii) the role of the ovary;
 - (iii) the role of the testis;
 - (iv) the role of the parathyroids;
 - (v) the role of the thyroid.

IA Objective Questions

10 objective questions to assess the student's ability to describe growth and development after birth.

The questions should be allocated as follows:

- | | | |
|----|-----|------------------|
| PC | (a) | 2 questions |
| | (b) | (i) 3 questions |
| | | (ii) 2 questions |
| | | (iii) 1 question |
| | | (iv) 1 question |
| | | (v) 1 question |

Several types of objective questions would be suitable for the above assessments.

Satisfactory achievement of the Outcome will be demonstrated by the student producing the correct response to all 10 questions.

**The following sections of the descriptor are offered as guidance.
They are not mandatory.**

CONTENT/CONTEXT

Corresponding to Outcomes 1-4:

1. Gametogenesis

Meiosis in terms of the behaviour of a pair of homologous chromosomes. The names of the divisions to be Interphase, Prophase, Metaphase, Anaphase, Telophase. The site of location within the ovary and testis. Structure of gametes at the light microscope level.

Oogenesis and spermatogenesis - the structure and process involved in the production and maturation of male and female gametes.

2. The growth and development of the foetus

Fertilisation, cleavage, implantation, differentiation. The development and gross morphology of the embryo, functions of the embryonic membranes (amnion, chorion and allantois) and placenta. The early establishment of the heart and blood vessels and blood circulation in the foetus studied. The involvement of the placenta in gas exchange - chorionic villi, umbilical cord. An outline of the main features of development and gross morphology of the foetus from two to nine months. Pre-natal tests could be discussed.

The pituitary hormones - Follicle stimulating and luteinising
The ovarian hormones - Oestrogen and Progesterone
The placental hormone - Human chorionic gonadotrophin.

3. Birth and Lactation

Birth

Describe the events preceding, during and after parturition, including the changes from foetal circulation to adult.

Lactation

The significance of colostrum. The difference in composition of human milk compared with cows and the arguments for and against artificial feeding could be included.

The role of oxytocin, prolactin (luteotrophin) hormones in birth and lactation.

4. After Birth

The general growth patterns of male and female children and the differences between their physical growth patterns; the appearance of secondary sexual characters; development of physiological sex functions.

The hormonal control of growth and development by growth hormone, parathyroid hormone, calcitonin, oestrogen, progesterone, testosterone, thyroxine.

Menstrual cycle.

Growth defects: dwarfism, gigantism, acromegaly, cretinism.

SUGGESTED LEARNING AND TEACHING APPROACHES

During the work of the module student should have several opportunities to practise their skills. Each student should be assessed at appropriate points throughout the module. Where a student is unsuccessful in achieving an Outcome, provision should be made for remediation and reassessment.

A student-centred, resource-based approach is likely to be the most flexible for this module. The Outcomes can be integrated so that concepts can be developed.

Selection of data, tabulation and drawing conclusions are examples of a problem-solving approach appropriate for establishing concepts.

The module could be successfully integrated with 7311001 Human Physiological Processes (x 1.5).

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