DEPARTMENT OF EDUCATION

COLLEGE PROGRAMME CATALOGUE

1967 - 1968

SECTION II

BIOLOGICAL SCIENCES AND TECHNOLOGIES

Quebec, September 1967.
TRANSLATOR'S NOTE

This document is essentially a translation of the 1967-8 College Catalogue, which originally appeared in the late Fall of 1967. Since this is the first year of operation of the College programme, it is inevitable that there will be some changes — some quite substantial — in the 1968-9 announcement. Faced with the choice between distributing information some of which may shortly be out of date, and distributing no information at all, the first alternative is obviously the only possible course.

It should be remembered that the College catalogue represents the total of courses and programmes approved for the system. Each individual College publishes its own announcement containing the courses and programmes which it is in a position to offer.

In preparing an English translation, changes have only been made where a direct translation would be misleading — for example — the replacement of required courses in French language and Literature with courses in English language and Literature. The following points of detail should be noted:

i/
1. What were originally required courses in Philosophy, and which are specified in the French language version, are designated by the term "Philosophy, etc." since the matter of equivalents is still under study.

2. The programmes for English as a first language and French as a second language were not complete when Section I of the catalogue went to press.

3. Where language courses in French or English are specified in the French language version, these have been exchanged.

4. A certain number of course descriptions, especially in the fields of the Social Sciences, Art and Language and Literature, do not fit directly into an English language programme. Where necessary such courses will have to be modified, although in most cases the aims and basic approach of the course are unlikely to have to be changed.

5. In some cases exact equivalents are difficult to find. "Sciences humaines", for example, covers all of what are known as "Social Sciences" in the English language sector together with a number of disciplines
usually classed under the heading of "Humanities".
"Sciences humaines" has therefore been translated as
"Social Sciences", and, for want of a better term the
sub-division "Sciences sociales" (meaning Anthropology,
Economics, Political Science and Sociology) is transla-
ted by "Social Studies".

6. In certain cases, experts consulted have disagreed  -or,
in exceptional cases, no expert could be found !-  so that
there are bound to be  some expressions of which some rea-
ders will not approve.

7. The French language version lists suggested text-books for
many courses. Although many of these are in English, be-
cause of the apparent non-availability of French language
texts, it has been decided not to specify text-books in
the English language version.

The translator wishes to express
his gratitude to the many people in educational establish-
ments
and in business and industry who so kindly gave their time to
checking his translations or, in some cases, providing comple-
te translations themselves.

James H. Whitelaw
Special Counsellor
Directorate of College Education.

Quebec, February 1968.
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NOTICE

This section of the College Course Catalogue contains, in addition to the programmes in Biological Sciences and Technologies, descriptions of the courses which go, or might go, to making up the areas of concentration or vocational specialization involving these disciplines.

As far as the courses are concerned, it should be noted that only those currently included in one of the programmes in the Catalogue are accompanied by details of the distribution of work-load.

The various departments of each College will be responsible for preparing the syllabus of each course, based on the course descriptions. The syllabus must include, in particular, a description of the aims appropriate for each course, instructions as to the way the course is to be given and a bibliography.

Courses forming a sequence are listed according to the chronological order of the terms in which they appear in the programmes; the other courses are listed in numerical order within their category.
As far as the programmes are concerned, they are listed according to their respective destination. In the case of programmes leading to university entrance, these are designated by the AREA OF CONCENTRATION, which defines their general nature, and the FIELD OF FUTURE STUDY, which makes it specific.

In the same way, in the case of programmes leading to types of employment requiring college-level preparation, these are designated by the VOCATIONAL DIVISION concerned, and the SPECIALIZATION which distinguishes each from the other.

For the academic year 1967-1968, only the programmes listed in this section will be recognized, and the courses in them credited. If modifications are found necessary, they must be submitted for approval to the Curriculum Division of the Directorate.
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### PREPARATION FOR: PHYSICAL EDUCATION

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PREPARATION FOR: OPTOMETRY

AREA OF CONCENTRATION: SCIENCE II

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11/
PREPARATION FOR: PHARMACY

AREA OF CONCENTRATION: SCIENCE II

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**SPECIALIZATION: RADIOGRAPHY**

**VOCATIONAL DIVISION: HEALTH TECHNOLOGY**  Programme 9

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### VOCATIONAL DIVISION: HEALTH TECHNOLOGY  Programme 10

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**VOCATIONAL DIVISION: HEALTH TECHNOLOGY**

**Programme 11**

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**VOCATIONAL DIVISION: HEALTH TECHNOLOGY**

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**FORESTRY TECHNOLOGY**

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NURSING

Revised 1968-9 courses to follow

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I

BIOLOGY
BIOLOGY

101-001-90 GENERAL BIOLOGY
A- General Biology I

Theory:
III- Multi-cellular organization: in the higher plants (metaphytes), in the metazoan.
IV- Diversity of living creatures: continuity of evolution.

Laboratory

B- General Biology II

Theory:
V- Maintenance of life: nutrition and metabolism in plants and animals. Functions of relation and regulatory functions, enzymes, hormones, neural coordination, sensory organs, body fluids, excretion.
VII- Ecology: organism and physical environment. Interdependence of organisms. The place of man in nature.

Laboratory
101-921-00 CYTOGENETICS AND EMBRYOLOGY

Theory:

Laboratory

101-922-00 INVERTEBRATE ZOOLOGY

Theory:

Laboratory:
101-923-00    HUMAN PHYSIOLOGY I

Theory:

Laboratory

101-924-00    BIOGEOGRAPHY OF QUEBEC

Theory:

101-931-00    HUMAN PHYSIOLOGY II

Theory:
Functions of nutrition.

Physiology of the internal organs. Physiology of the circulatory system. Physiology of the heart. Physiology of the respiratory system. Physiology of the digestive system. Physiology of the excretory system. The reproductive function. Physiology of male and female reproductive organs.
Laboratory

101-932-00 COMPARATIVE CHORDATE ZOOLOGY
Pre-requisite 101-922-00

Theory
Principles of taxonomy. Study of the evolution of different systems by groups: chordates; prochordates and vertebrates. Evolution. General characteristics from cyclostoms to mammals.

Laboratory

101-933-00 PLANT BIOLOGY
Pre-requisite 101-001-90

Theory

Laboratory
101-934-00  HUMAN BIOLOGY I

Human body
General description, functions, organs, topography of the human body.

Cytology
The human cell (composition, physiological properties, division).

Histology
General structure of a tissue, different varieties, membranes (description, varieties).

101-935-00  HUMAN BIOLOGY II

Osteology

Myology

101-936-00  HUMAN BIOLOGY III

Digestive system
Associated glands. Physiology of digestion. Pathology of the digestive system. Circulatory system.
Blood: description and composition, coagulation and its role. Pathology of the circulatory system.

101-937-00  HUMAN BIOLOGY IV

Respiratory system
Division of respiratory tracts, lungs. Physiology of respiration. Pathology of the respiratory system.

Endocrine system
Endocrine glands, comparison of sexual characteristics. Pathology of endocrine glands.
Urinary system
Renal anatomy, renal physiology, anatomy and physiology of the urinary tract, urine, pathology of the urinary system.

Nervous system
Nerve cytology and histology, division of the nervous system (central, peripheric, vegetal).

Sensory organs
Skin and touch, eye and vision, ear and hearing, tongue and taste, nasal passages and smell. Pathology of the nervous system and of the sensory organs.

Reproductive system
Anatomy and physiology of male and female genital systems. Pathology of genital organs of both sexes.

101-938-00 RADIOMETRY 3-3-3

101-941-00 MICROBIOLOGY 2-3-3
Theory

Laboratory
101-942-00 MICROBIOLOGY

Theory

Laboratory
Identification of cocci and of coliform bacteria. Examination of smears of pathogenic bacteria. Identification of the most common blood and intestinal parasites.

101-951-00 INSTRUMENTAL BIOLOGICAL ANALYSIS

Theory

Laboratory
Laboratory exercises with apparatus of which the theory has previously been presented.
INSTRUMENTAL BIOLOGICAL ANALYSIS

Theory

Laboratory
Laboratory exercises with apparatus of which the theory has previously presented.

FORESTRY BOTANY

Historical outline. Plant geography and phytography. Classification of the main groups of forest plants. Study of the reproductive cycles.

DENDROLOGY

Morphology and classification of the principal forest types: description, distribution and economic value. Anatomy of wood: study of the anatomical characteristics of different types of wood. Macroscopic and microscopic characteristics which help to identify the principal forest types.

2- Study of different groups. In each group, anatomical study of a typical representative: protozoa (amoeba), porifera (sponges), coelenterates (fresh water hydra), platyhelminthes (tenia), aschelminthes (ascaris), molluscs (mya), annelids (earth worms), arthropods (lobsters), echinoderms (starfish). Chordates: prochordates, vertebrates, different classes.


101-963-00 CYTOLOGY AND GENETICS 1-1-1

Theory
Laboratory
After acquainting himself with the principal instruments of cytology, the student makes a number of observations of single-cell organisms: bacteria, yeast, algae, then tissues of the animal and plant kingdoms. Observation of blood elements, of the phenomena of osmosis and enzymatic digestion. Study of cell components of cell division. Problems in genetics.

101-964-00 CYTOLOGY AND GENETICS

Theory

Laboratory
After acquainting himself with the principle instruments of cytology, the student makes a number of observations of single-cell organisms: bacteria, yeast, algae, then on tissues of the animal and plant kingdoms. Observation of blood elements, of cell components of cell division. Problems in genetics.

101-970-00 PHYSIOLOGY

Theory

Laboratory
Study of living matter from the point of view of its chemical composition and its physical properties. Organization of living matter: cells, tissues and organs. Comparative study in various animals, of the digestive system and its physiology.
101-972-00  PHYSIOLOGY

Theory

Laboratory
Dissection and comparative study, in various animals, of the respiratory circulatory, urino-genital and nervous systems, including sensory organs.

101-973-00  EXPERIMENTAL PHYSIOLOGY
101-974-00

Laboratory
This course prepares the student for work in experimental or research laboratories. Modern experimental methods in physiology and serology. Study of the influence of bacterial infections or certain drugs. Statistical curves. Elements of respiratory physiology.

101-981-00  HAEMATOLOGY

Theory
Laboratory

101-982-00 HAEMATOLOGY

Theory
Pathological haematology. Principal causes of pathological variations in the number of blood cells. Haemorrhagic diseases. Elements of serology: physiology and application.

Laboratory

101-990-00 SPECIAL BIOLOGY

Biochemistry

Nutrition
Importance of rational feeding. Study of foods: composition, role, nutritive value, digestibility, effect of a deficiency. Elaboration of a diet according to Canadian food regulations. Adapting of nutrition to various ages.
Microbiology

101-991-00 HISTOLOGY

Theory
Physiological data concerning certain laboratory animals. Surgical techniques. Histological techniques: sampling, function and coloration of the four primary tissues and their activity.

Laboratory
Surgical techniques for laboratory animals; microtome cutting and coloration.

101-992-00 HISTOLOGY

Theory
Histology of circulatory, tegumentary, digestive, respiratory, urinary, endocrine and reproductive systems.

Laboratory
Study through mounted preparations of the major systems of the higher organisms.
II

FORESTRY TECHNOLOGY
Course outlines to follow.
III

NURSING
1968-9 Course outlines to follow.

Outlines will also be provided for certain specialized Biology courses, listed in Programme 6, but not yet incorporated in the Biology section.
IV

DENTAL TECHNOLOGY
DENTAL TECHNOLOGY

Course outlines to follow
V

RADIOLOGICAL TECHNOLOGY
115-101-90  RADIOGRAPHIC TECHNIQUE I


115-201-90  RADIOGRAPHIC TECHNIQUE II


115-301-00  RADIOGRAPHIC TECHNIQUE III

Essential factors in radiography. Factors for photographic effect. Technical factors, reasons and conditions for their choice. Radiographic technique for each system: ossecus, digestive, respiratory, circulatory, urogenital and endocrine.

115-401-00  RADIOGRAPHIC TECHNIQUE IV


115-501-00  RADIOGRAPHIC TECHNIQUE V

115-601-00  RADIOGRAPHIC TECHNIQUE VI

These courses are given in the hospital

115-102-00  RADIOThERAPEUTIC TECHNIQUE I

Equipment in therapeutic Radiology


Treatment planning


Radiography for therapy technicians

Basic knowledge of photography. Basic technique in radiography. Film processing technique. Radiographic and fluoroscopic technique. Radiographic techniques applied to therapy.

Applied Radiotherapy


Surgery
Radical, e.g. gastrectomy. Combined with radiotherapy, e.g. post-mastectomy, craniotomy, etc. Palliative. Reconstructive surgery.

Hormones
Estrogens and androgens. Castration in relation to the administration of hormones. Use of hormones in menopause. Palliative nature of the hormone therapy. Adrenalectomy. Hormones from the venal glands. Cortisone, prednisolone, meticorten, etc. Application of hormonal therapy to the treatment of cancer of the breast, the prostate, leukemia, etc.

Chemotherapeutic agents
Radiomimetic agents. Nitrogen mustard derivative. Anti-metabolic. Anti-mitotic. Clinical use and application of these agents should be discussed with regard to the expected results from their use. Give the indications and contraindications of the use of this form of treatment: mention the complications stemming from the administration of such agents, so that the technician may become a knowledgeable observer.
115-203-90 RADIOISOTOPE TECHNIQUE II 6-3-5

Instrumentation

115-303-00 RADIOISOTOPE TECHNIQUE III 9-0-3

Isotope laboratory technique
- Laboratory apparatus: centrifuge, balance, haematocrits and their use.
- Dilution technique.
- Basic bacteriology and sterile technique.

115-403-00 RADIOISOTOPE TECHNIQUE IV 9-0-4

Physiology and pathology.
- Basic haematology: chemistry of metabolic processes, application of radioisotopes.
- Specific studies in the use of radioisotopes.

115-503-90 RADIOISOTOPE TECHNIQUE V 6-3-2

A- General techniques for the radioisotope laboratory
- Laboratory apparatus and glass ware, centrifuge, incubator, waterbaths, balance, haematocrit lectures.
- Remote control equipment.
- Pipetting and dilution methods, series dilution included. Basic bacteriology and sterile technique.

B- Physiology and pathology.
- Administration of radioisotopes.
- Special studies in the use of radioisotopes.
- Study in the use of radioactive colloids.

115-504-00 RADIOISOTOPE SCANNING 3-0-2
115-604-00 RADIOISOTOPE SCANNING 3-0-2
115-508-00 TERMINOLOGY I 3-0-2


115-608-00 TERMINOLOGY II 3-0-2

Radiological anatomy, anatomic terms.

115-509-00 CONTACT THERAPY I 3-0-2
115-609-00 CONTACT THERAPY II 3-3-2

Combinations of the primary beams
Three beam systems. Multiple beams.
Corrections for irregular surfaces and tissue density.
Use of bolus and compensatory filters.
Use of wedge filters. Combination of beams using wedge.

Rotational and pendular therapy
Tissue/air relationship. Treatment planning and the use of this relationship. Influence of contour, angle of rotation, centre of rotation on the distribution of isodose curves.

Treatment planning
Use of tissue/air relationship in the angulation of a fixed source.
Distribution of a test dose in certain special cases.
Problems concerning the calculation of exposure doses necessary to fill the prescription for the plan given.

Mechanical aids

620-00 PEDIATRICS I 626-00 NEUROLOGY I
621-00 PEDIATRICS II 627-00 NEUROLOGY II
622-00 CARDIOLOGY I 628-00 SURGERY I
623-00 CARDIOLOGY II 629-00 SURGERY II
624-00 ORTHOPEDICS I 630-00 OBSTETRICS I
625-00 ORTHOPEDICS II 631-00 OBSTETRICS II

Courses 620 - 631, distribution of work-load: 3-0-2

115-911-00 APPLIED RADIOTHERAPY 3-3-2

Aim or objective of the use of ionizing radiation in medicine: in malignant tumors, in benign tumors, in inflammatory lesions, in malfunctioning systems.
Reasons for the choice of treatment.
Malignant tumors.
Benign lesions, which are often to be treated by radiotherapy.
VI

PHYSICAL EDUCATION
**Aims**

At this level, three aims should be set:

1. Physical development, based on the individual degree of physical maturity;
2. The development of habits and a healthy attitude towards the practice of physical training;
3. Psychological and social development of the individual.

**Method**

The type of organization described, the characteristics of the programme presented and the maturity of the student require a method which encourages freedom of choice and commitment on the part of the individual.

The instructor will therefore employ a very flexible kind of teaching, although he must make his requirements clearly understood. Teaching procedures will be in accordance with this approach.

**Activities**

1. **Conditioning**

   Physical exercises designed to improve the condition of organs and muscles.

   Students must take, in the first and third terms (men) or the second and fourth terms (women), one period per week of conditioning.

   The kind of activity laid down will be related to the major weaknesses commonly observed in most students at this level.

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(1) It has been considered appropriate, in the special case of Physical Education, to give details here which would normally belong to the syllabus.
2. **Individual activities and sports**

Forms of activity based to a greater degree on the inclination of the individual, making for the development of specific aptitudes and the growth of physical, mental and social qualities.

In each term, the student will take part in an individual sport.

The range of activities suggested will be in keeping with the present and future state of sport in Quebec, the climate, which affects the practice of certain activities, and the need for variety which a sensible programme of physical education should offer at this level.

Activities suggested:

Track and field, badminton, American hand-ball, cycling, fencing, creative movement, golf, gymnastics, weight-lifting, judo, wrestling, swimming, figure skating, diving, eurythmics, skiing, squash, tennis.

Distribution of activities by term:

-Men: Terms I and III:

Badminton, American hand-ball, fencing, gymnastics, weight-lifting, judo, wrestling, swimming, squash.

Terms II and IV:

Track and field, American hand-ball, cycling, golf (term IV only), judo, swimming, diving, skiing, squash, tennis.

-Women: Terms I and III:

Badminton, fencing, creative movement (term III only), swimming, figure-skating, eurythmics.

Terms II and IV:

Track and field, fencing, creative movement (term IV only), golf, gymnastics, swimming, diving, eurythmics, skiing, tennis.
3. Team_sports

Since individual activity should not be the sole feature of the programme, the student should be directed also towards activities where he can prove himself as a mature and well-balanced individual.

The choice of two team-sport activities will enable the student not only to complete, through more advanced techniques, his high-school experience, but also to satisfy social needs of which he has become aware at that level.

Suggested activities:

Basket-ball, volley-ball, European hand-ball, hockey, water-polo, soccer.

Distribution by term:

-Men: Terms I and III:
Basket-ball, volley-ball, hockey.

Terms II and IV:
European hand-ball, water-polo, soccer.

-Women: Terms I and III:
Basket-ball, volley-ball, European hand-ball.

Terms II and IV:
Nil.
Notes

1. It should be noted that at least one of the six sporting activities required should be a water sport, selected during one of the first three terms.

2. The same activity may be selected more than once in the four terms, with the exception of conditioning and track and field where course content extends over two terms.

3. The sports medical examination, provided that it is made compulsory, will be a decisive factor in the choice of activities; it should be further noted that the results of these examinations and the services offered in this area will have an effect on the attendance in the academic programme as a whole.

4. Some activities may be offered to mixed groups; others may be selected by both sexes but be held separately, and, finally, some, because of their special character, will have to be reserved for one or other sex only.

5. Hockey (men) and skating (women) can only be offered if a covered artificial rink is available.

Conclusion

The total activity carried on during the compulsory periods (two per week) should be rounded out by voluntary participation of all in one of the two complementary phases of the programme: intra-mural and intercollegiate activities.