SM 6/v/67

3B
Kinesiology

Ad Hoc Committee of Senate.

Terms of reference.

1. Clarify to what extent listed Physical Development courses are acceptable in the Department of Biological Sciences as courses forming part of the Biology course credits for a major or honors or Physical Development 320 for sociology major etc.

2. Review of course make up to ensure that taking into account the early state of development of the science of Kinesiology - they are satisfied that the courses are significant. (Experts may be flown in for consultation at the expense of the general University travel budget).

3. Submit proposals to the next meeting of Senate whereby this program may be offered as a B.Sc major. I am loath at this time to consider the proliferation of degrees.

Membership.

Science	Arts	Education
Dr. D. G. Tuck	Dr. F. B. Collinge	Dr. G. Kirchner
Dr. W. Vidaver	Dr. J. Tietz	Dr. N. Robinson.

To carry out these duties the committee should consult as widely as possible and the committee has the power to co-opt members.

SM 6/2/67 19th January, 1967.

Kinesiology

REPORT

To: President and Senate

Subject: AD HOC COMMITTEE OF SENATE ON KINESIOLOGY

The committee which you appointed on the kinesiology program, and which you asked me to convene in your letter of December 12th, has had three meetings since that date (December 20th, January 10th and January 18th). I should explain immediately that the committee was late in meeting in the first place because I was sick and away from the campus for a week, and there was then an unavoidable delay because some members of the committee had to leave campus over the Christmas vacation. This of course, prevented us from meeting the deadline of January 9th fixed by Senate when the committee was set up, but I hope you will agree that the many important problems involved warranted thorough deliberation rather than over-hasty decision.

We have reviewed the chronological order of events which led up to the present situation, and Dr. Kirchner kindly provided all members of the committee with the many relevant documents, which we have looked through and considered. Your letter of December 12th set out three terms of reference, and you may well come to the conclusion on reading this report that we have ignored all of these. Let me assure you therefore at the outset that this is not the case. We have tried firstly to reach a decision which will allow the Department of Physical Education to make some statement in the Calendar to satisfy the students whom we understand desire to follow the kinesiology program. Secondly, we have tried to point the direction in which the University should go in setting up this and similar programs in future. We feel this is the most important outcome of our discussions, which led inevitably to the point where we were forced to think about how the kinesiology program was to be administered, and in fact we found it impossible to separate this from the general matters set out in your terms of reference. At our second meeting therefore we adopted two motions, both of which were passed unanimously by the committee as then constituted.

The first motion reads:

"This committee recommends that the Senate should establish a high level inter-faculty body to administer interdisciplinary programs under terms of reference to be dictated by Senate."

The second motion reads:

"That the administrative inter-faculty body referred to in motion 1 should be directed by Senate to implement the program on the study of human movement with the intention that this should be offered as a Bachelor's degree program."

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The point here I think is quite straightforward. The committee was faced with a choice, either of recommending some simple motion or motions of the sort set out above, or else being unable to make any recommendation to Senate at least before the end of this semester. This is simply because a thorough discussion of the details of the kinesiology program is vital before the program can be implemented, no matter how many detailed course descriptions are offered, and we could not do this in the time available. Furthermore it is quite clear that such a protracted discussion would effectively prevent the kinesiology program being offered by this University before September 1968. It may be therefore that we have failed to meet the terms of reference set by you in this respect, but the committee felt that we had very little option on this matter.

I think it is important that I should set out for you, and for Senate, some of the implications which the committee felt were involved in these two motions. The first point is that we regard the order in which the motions are presented as extremely important, and we do not feel that implementation of the second motion can precede action on the first.

Let me try to explain what we see as the necessary functions of the high level administrative body referred to in our first motion. The most important function is that there should be at the head of this body a full time academic of rank at least equivalent to a Dean. One of his tasks would be to ensure that the kinesiology program, and indeed all the future interfaculty and interdisciplinary programs envisaged at the founding of the University, are run properly under the conditions which Senate will no doubt lay down. There was complete agreement on the committee that to administer a program of the complexity and breadth envisaged for kinesiology requires much more than the irregular meeting of various members of faculty from the disciplines involved. There was no doubt in our minds that a full time person responsible for these matters is needed in the University if interdisciplinary programs are to be treated with the seriousness which the University intends. We feel that this person would be responsible, as is a Dean responsible to his Faculty, for the following matters:

1) He would prevent the proliferation of courses between one Faculty and another. The committee regarded this as a most important point and we would be strongly against any system of running interdisciplinary programs which would result, for example, in courses in biology being offered by anybody but the Department of Biological Sciences, or courses in sociology being offered by anybody other than P.S.A. The committee believes that such duplication is always possible if an interfaculty program should get out of control - if one faculty, for example, felt that required courses in an interdisciplinary program were not being properly offered in another faculty. Only somebody with complete authority over these programs can help to prevent such proliferation, which would obviously be extremely undesirable from every point of view.

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2) He, and his associated appointed committees, would rule on the admissibility of any interfaculty and interdisciplinary programs which might be suggested in the future before such programs were presented to Senate for their final approval. This action is parallel to that taken by the present Faculties under their Deans.

3) He, and his committees, would take responsibility for presenting to the appropriate University committees recommendations on the financing and the faculty staffing of departments called upon to provide, for an interfaculty program, service courses which they would not normally wish to offer as part of their honors or major program.

4) He, and other faculty involved, would effectively function as a faculty body and we believe that they would be the body recommending to Senate that the appropriate students receive degrees as graduates of the University.

What we are effectively recommending is a body which will have many of the functions of a separate Faculty but will not appoint its own teaching staff. The most important point in our view is that this body, be it Faculty or otherwise, should be run by a high level academic person, perhaps equivalent to an academic vice-president as presently understood in some other North American Universities.

In wording the second motion on p.1, we deliberately avoided any decision as to the name to be given to the degree awarded to students who complete the program in kinesiology. Strong views are held about this in some parts of the University, but we felt that to debate all the points involved at this time would hold up acceptance of the program. We therefore suggest that one of the actions of the proposed administrative body should be to resolve this in consultation with the interested parties.

As I said at the beginning of this report, we may have failed to answer some of the terms of reference which you laid down for us. I would suggest however that we have achieved something at least as useful, which is to recommend a route whereby a proper, serious and detailed consideration of the program on kinesiology, and other future interfaculty programs, can be carried out. Senate would I believe be mistaken if it allowed itself to go forward with a program in kinesiology which had not been properly considered in detail; but as I said earlier, it is quite clear that such a consideration by the present committee would be long, detailed, and tortuous, and would effectively prevent kinesiology being offered before September '68. This, we believe, was not the wish of Senate, and we therefore recommend that the calendar should show that there is to be a degree program in kinesiology without specifically mentioning the name which the degree will be given when it is awarded.

D. G. Tuck
Convenor

SM 6/2/69

Kinesiology

BACKGROUND INFORMATION TO THE REPORT OF THE AD HOC COMMITTEE OF SENATE ON KINESIOLOGY

SM 68/67

Kinesiology

PROPOSED INTERDISCIPLINARY PROGRAM

for the

STUDY OF HUMAN MOVEMENT

The following paper represents a proposal to the University Senate for the development of an interdisciplinary Program for the advancement of the study of human movement. The justification for the development of such a program appears in Appendix A. The areas of study of concern to the student of human movement may be identified as being studies related to human structure and function, human motor development and performance, and the inter-relationships of human development and social change. The program is designed to permit students to concentrate their studies in these areas while satisfying the requirements for a bachelors degree.

The course requirements for the proposed degree program are as follows:

SCIENCE REQUIREMENTS

The majority of the course requirements for the first two years would be identical to those for all biology science majors so that students might develop a basic foundation in the biological sciences before preceeding to a study of man with respect to movement. It is anticipated that within these courses it will be possible for students following this program to emphasize animal biology and in particular as it relates to man.

Lower Division:

Bio.	101-4	-	Intro Bio.
Bio.	102-4	-	Intro. Bio.
Bio.	201-3	-	Cell Bio. & Bio. Chem.
Bio.	202-3	-	Human Genetics
Bio.	203-3	-	Developmental Bio.
Bio.	204-3	-	Ecology
Chem.	101-3	-	Gen. Chem. I
Chem.	106-2	-	Chem. Lab.
Chem.	102-3	-	Gen. Chem. II
Chem.	116-2	-	Chem. Lab.
Chem.	251-3	-	Organic Chem. I
Chem.	256-2	-	Organic Chem. Lab.
Physics	101-3	-	Gen. Physics I
Physics	102-3	-	Gen. Physics II
Math	101-3	-	Intro. to Statistics
Math	111-3	-	Fund. Math I
Math	112-3	-	Fund. Math II

Upper Division:

Bio.	305-3	-	Animal Physiology
Bio.	316-3	-	Vertebrate Zoology
Bio.	425-3	-	Physiology Laboratory

ARTS REQUIREMENTS

In that an understanding of human movement must include study of man as a social organism, it is further proposed that a number of Arts courses be included within the course requirements for students following this proposed program.

Lower Division

P.S.A.	121-3	-	Social Structure
Psych.	201-3	-	General Experimental Psychology

Upper Division

Psych.	380-3	-	Physiological and comparative Psychology

PHYSICAL DEVELOPMENT CENTRE REQUIREMENTS

In that many of the knowledges important to the study of human movement are not presently systematically organized into existing academic courses, the proposed program includes a number of new courses to be taught by the Physical Development Centre. (Course outlines are included in Appendix B.)

* P.D.	301-3	-	Human Anatomy
* P.D.	303-3	-	Human Growth and Physical Development
* P.D.	306-4	-	Applied Anatomy of Human Movement
P.D.	320-3	-	Sociology of Human Movement
P.D.	401-4	-	Mechanics of Human Movement
* P.D.	405-3	-	Physiology of Motor Activity
P.D.	420-3	-	Human Motor Behavior

*These courses have been accepted by the Department of Biological Sciences as acceptable elective courses for meeting the requirements of a B. Sc. degree with a major in Biology.

SM 6/2/67

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OUTLINE OF SEMESTER HOUR REQUIREMENTS

	SEMESTER HOURS
Science	59
Arts	9
Physical Development Centre	23
Elective	
Lower Division . . .	4
Upper Division . . .	25
Total	120

As there are many directions in which the study of human movement may be pursued, it is proposed that the selection of work for students wishing to follow an honors program in this area be left to the discretion of the student with the approval of his advisor. The honors program would, however, require students to complete honors paper as well as satisfying the credit hours requirement.

JUSTIFICATION SM 6/2/67 Kinesiology

The complete justification of professional preparation programs for personnel in the fields of health, physical education, recreation and athletics is too extensive in scope to be adequately described in this document. It is felt, however, that the rationale behind these programs should be well understood and accepted by the university as a whole if they are to reach their full potential. Each of these fields has evolved from a recognition that man is unique in the animal world and that he has the capacity to understand and direct the forces of nature. The fields of health, physical education, recreation and athletics although using different means have as a common objective the furthering of man's understanding of himself - his structure, his functioning, his behavior, his surrounding, and the relationships among them. The ultimate goal is the development of individuals who are active functioning members of society capable of using their physical potential to maintain and enrich their lives.

Traditionally, physical education has projected the image of merely transmitting rules and techniques of sports, dance, and games. The results of such an emphasis are evident in this generation of adults who hold many misconceptions regarding the field and its values in an academic setting. In essence, the emphasis in physical education has been on what it could do for people rather than the development of a field of knowledge. This is particularly evident in teacher education programs of Canadian and American Universities. A student planning to teach physical education has been required to take course work oriented to what he may teach, how he might teach, and how he would administer a physical education program. In contrast, students planning to teach subjects other than physical education at the high school level undergo the study of a series of increasingly more complex course work in their major subject.

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Furthermore, these majors consist of course content far more advanced than anything that will be taught in high school.

It is the belief of the Physical Development Centre that the training of a professional physical educator should be founded on an extensive study of the theoretical and scholarly knowledges basic to physical education and the development of specific knowledges and skills related to motor activities. Following completion of such a program, students wishing to teach in the schools would supplement their major with the necessary courses in methods and other professional topics. This implies that there exists in physical education an organized body of knowledge, the acquisition of which is assumed to be an adequate and worthy objective as such, without any demonstration or requirement of practical application. It is our contention that there does in fact exist a scholarly field of knowledge which is unique and basic to physical education.

Physical Education as an Academic Discipline - Kinesiology.

The academic discipline of physical education encompasses aspects of the fields of anatomy, physiology, physics, anthropology, sociology, history and psychology. The focus of attention is directed toward the study of man as an individual, engaging in motor performances required by his daily life and in other motor performances yielding aesthetic values or serving as expression of his physical and competitive nature. An understanding of the comprehensive and and integrated knowledges of the motor behavior and capabilities of man cannot be accomplished by studying each of the fields listed above. The areas within these fields vital to physical education receive only peripheral treatment rather than systematic development.

Since the academic discipline of physical education cannot be synthesized by a curricula of selected courses from other departments another approach must be taken. It is first necessary for students wishing to master

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SM 6/2/67 Kinesiology

this discipline to pursue general courses in a number of the natural, behavioral and social sciences. The upper division course work in physical education however, needs to be specialized or the development of the subject field would be haphazard, incomplete, and ineffective. The latter areas of study may be defined as the Science of Kinesiology.

Kinesiology is of Greek derivation, and is a combination of two Greek verbs, "Kinein" - meaning to move, and "Logos" - meaning to discourse, usually on a doctrine, theory, or science. As defined in Dorland's Medical Dictionary * (1), Kinesiology is "the scientific study of movements" and must include ... "the sum total of man's knowledge of human movement."

The unique contribution of Kinesiology is that it selects from sciences such as anatomy, physiology, physics, psychology and sociology those principles which are pertinent to human motor performance and systematizes their application. The object of Kinesiology is to explain human motor performance, co-ordination, and skill with respect to structural, functional, behavioral and mechanical variables.

More specifically the study of Kinesiology would include body mechanics; the physiology of exercise, training, and environment; neuromotor coordination, the kinesthetic senses, motor learning and transfer; emotional and personality factors in physical performance; and the relation of all these to human development. Also included in this discipline is the role athletics, dance, and other physical activities play in the culture (both historic and contemporary) and their contribution to society as a whole.

* (1) Dorland's Illustrated Medical Dictionary. Twenty-third Edition, Philadelphia: W. B. Saunders Company, 1957, P. 715.

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Kinesiology, as a field of study, does not consist of the application of anthropology, physiology, psychology, and the like to the study of physical activity. On the contrary, it has to do with the study, as a discipline, of movement and its relationships to certain aspects of anthropology, physiology, psychology, and other appropriate fields. The student who majors in this cross-disciplinary field of knowledge will not be a physiologist or a psychologist or an anthropologist, since there has necessarily been a restriction in breadth of study within each of the traditional fields. Moreover, the emphasis must frequently be placed on special areas within each of these fields. This is comparable to the situation in a number of the disciplines. A biochemist, for example, is necessarily deficient in his breadth of training as a chemist, and he is also necessarily narrow as a biologist. Nevertheless, he is a more competent biochemist than is a chemist or a biologist.

Problems certainly occur in delimiting the field of knowledge outlined above. The development of personal skill in motor performance is without question a worthy objective in itself, but it should not be confused with the academic field of knowledge. Similarly, technical competence in measuring a chemical reaction, or computational skill in mathematics, are not components of the corresponding fields of knowledge. Learning the rules and strategy of sports may well be intellectual, but it is highly doubtful if a course on rules and strategy can be justified as a major component of an academic field of knowledge at the upper division university level.

One may well raise such questions as where, for instance, is the borderline between a field such as physiology and the field of kinesiology? No simple definitive statement is possible, but it is not difficult to show examples that illustrate the region of demarcation. The existence of oxygen debt is physiology; the role of oxygen debt in various physical performances is kinesiology. We do not know why a muscle becomes stronger when it is exercised

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repeatedly. The ferreting out of the causal mechanism of this phenomenon can be considered a problem in physiology, although the explanation, when available, will be appropriate for inclusion in a kinesiology course. On the other hand, the derivation of laws governing the quantitative relation between an increase in strength and the amount, duration, and frequency of muscle forces exerted in training is surely more kinesiology than physiology. Determination of the intimate biochemical changes in a muscle during fatigue would seem to be a problem in physiology, although of direct interest to kinesiology. Here again, the quantification of relationships and the theoretical explanation of their pattern as observed in the intact human organism is more kinesiology than physiology. The physiology of athletic training is not really application of physiology -- rather it is physiology, of the sort that is part of the academic discipline of kinesiology.

The study of the heart as an organ is physiology, whereas determining the quantitative role of heart action as a limiting factor in physical performance in normal individuals is perhaps more kinesiology than physiology. (Certainly the physiology textbooks consider such limitation chiefly with respect to the diseased rather than the normal and physically gifted individuals.) Thus quantitative elucidation of the role of such variables in causing individual differences in performance in the normal range of individuals is of particular concern to physical education but evidently of little interest to physiology. (All of these examples are, of course, borderline by intent.)

Textbooks on exercise physiology are written for physical education courses. Much of the research they describe was done by physiologists. On the other hand, a standard textbook on physiology written for physiologists may not even have a chapter on exercise, and if it does, the treatment is notably incomplete. Similar examples are to be found in the field of anatomy. Textbooks on psychology have at best a sparse treatment of such topics as reaction time, the kinesthetic

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sense, and motor performance. These are not matters of fundamental interest to present-day psychologists, although they did occupy a position of importance in the first two decades of the present century. Even though anthropologists have long been aware of the role of physical games and sports in all cultures, one cannot find comprehensive treatments of the topic in anthropology textbooks.

It would be unfair to say that scholars in various fields such as those mentioned above feel that it is unimportant to study man as an individual engaging in physical activity. Rather, the neglect is because this aspect is of peripheral rather than central interest to the scholar in that field.

Perhaps it is not being overly presumptuous to suggest that there is an increasing need for the organization and study of the academic discipline herein called kinesiology. As each of the traditional fields of knowledge concerning man becomes more specialized, complex, and detailed, it becomes more differentiated from physical education. Physiology of the first half of the century, for example, had a major interest in the total individual as a unit, whereas present-day physiology focuses attention on the biochemistry of cells and subcellular structures. While the importance of mitochondria in exercise cannot be denied, there is still need to study and understand the macrophenomena of exercise. Furthermore, the purely motor aspects of human behavior needs far more attention than they currently receive in the traditional fields of anthropology and psychology. If the academic discipline of kinesiology did not already exist, there would be a need for it to be invented.

The study of human movement and its many interrelated knowledges is of importance to a wide variety of scholars. These scholars include not only the physical educator, the athletic coach and the physical recreation specialist but also the many therapists who utilize physical activities to assist in the prevention, correction and rehabilitation of persons afflicted with

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diseases and injuries which affect their motor function. Recently a considerable amount of interest in the knowledges in this area has also been exhibited by persons concerned with working with the mentally retarded, and the emotionally disturbed. The medical profession as well has begun to recognize the importance of the study of physical medicine and the need for practitioners to understand the importance of exercise and motor activities in the prevention and correction of many illnesses. Another group of individuals deeply concerned with the study of man as a physical being are those who work in the many fields of health and health education. The study of kinesiology as an academic discipline therefore, is becoming of increasing importance to a wider and wider group of professional and technical occupations. The training of professional workers in each of these different occupations requires from slightly to markedly different professional and technical experiences but have similar needs with respect to scholarly and theoretical experiences.

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SM 6/2/69

Revised 69

PROPOSED INTERDISCIPLINARY PROGRAM

for the

STUDY OF HUMAN MOVEMENT

APPENDIX B - Course Descriptions

Many of the courses listed in the proposed program of study have already been accepted as legitimate courses within the Faculty of Science, and need not be discussed here. A justification and discussion of those courses not so accepted however, is presented below.

The development of the specifics of each course have been worked out in collaboration between faculty members of the Biological Science Department and the Physical Development Centre. The courses so developed satisfy the needs and interests of both groups, avoid duplication of existing courses materials, and, it is expected, are of sufficient quality to be acceptable to the University as a whole.

The general procedures for handling new courses would be similar to that used by other departments within the university. Large lecture sessions would be combined with smaller tutorial and laboratory sessions. Every effort would be made to arrange tutorial groups so that students emphasizing a particular area of study might be brought together under a specialist in that area. As the proposed courses do not go beyond the knowledge and capabilities which might be expected of an undergraduate student, a more complete study of the discipline would be left to the graduate level.

SM 6/2/67

Kinesiology

Course number: P. D. 303-3

Course title: HUMAN GROWTH and PHYSICAL DEVELOPMENT

Credit Hours: 3. (2 hours lecture
1 hour tutorial
3 hours laboratory)

Prerequisites: P. D. 306 (Human Anatomy)

Course Objectives: The processes, stages and characteristics of normal human physical development, the factors affecting this development, and the genetic and environmental variations in human motor behavior.

Course content:

I. Fundamental Concepts of Physical Growth and Development.
- Terminology and meaning
- General Principles
- Sequences and classification of body changes
- Genetic foundations

II. Characteristics and progress of pre natal physical growth and development.
- Periods of development and characteristics
- Factors related to size at birth

III. Characteristics and progress of post natal physical growth and development.
- Neural
- Glandular
- Physical a) bodily systems
  b) body shape and form
  c) motor development
- Factors affecting post natal growth and development
  a) Genetic
  b) Gravitational
  c) Traumatic
  d) Disease

IV. Motor activity and its effects on the advance and retardation of normal physical growth and development.
- Immediate or short term effects
- Secular effects
- Age and activity needs
- Appropriate and inappropriate motor activities for optimal physical growth and development.

V. Measurement and evaluation of growth and developmental characteristics.
- Physical Growth Studies
- Methods and instruments of measurement
- Analysis of data

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SM 6/x/67 Kinesiology

Course number: P. D. 306-3

Course title: HUMAN ANATOMY

Hours of Credit: 3. (2 hours lecture
1 hour tutorial
3 hours laboratory)

Prerequisites: Bio. 316 (Vertebrate Zoology)

Text: "Introduction to Human Anatomy" - Carl C. Francis.

Course Objectives: The concepts and knowledge of human microscopic and macroscopic anatomy which lead to a comprehensive understanding of the physiological, mechanical and ontogenetic aspects of human movement.

Course content:

I. Fundamental anatomic concepts
- Directional terms
- General orientation planes and axes
- Surface anatomy and land marks.

II. Skeletal System
- Gross and microscopic bone structure
- Classification and organization of bones
- Articulations - structural characteristics

III. Muscular System
- Gross and microscopic structure and composition
- Gross organization of skeletal musculature
  - Head and Spinal Column
  - Thorax
  - Upper extremity
  - Lower extremity
  - Trunks

IV. Nervous System
- Classifications and microscopic structure
- Structural Organization
  - The motor unit
  - Plexes
  - Spinal Cord
  - Brain
  - Autonomic Systems
  - Sensory Systems

V. Circulatory System
- Structural Organization and Characteristics
- Microscopic Structure of Organs and Vessels

VI. Respiratory System
- Structural organization and characteristics
- Microscopic structure of respiratory apparatus
- Volumes and Sinuses

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VII. Structural Organization and Characteristics of Complimentary Systems.
- Digestive System - alimentary canal, accessory organs
- Urinary System - kidneys, ureters, bladder and urethra
- Endocrine System - hypophysis, suprarenal, thyroid, parathyroid, pancreas, ovaries and testes.
- Lymphatic System - vessels, ducts, nodes, spleen, tonsils, thymus.
- Integumentary System - skin, hair, glands.

VIII. Measurement and Evaluation of Structural Characteristics
- Anthropometry
- Somatotyping
- Posture

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SM 6/8/67 Jamieson

Course number: P. D. 301-4

Course title: APPLIED ANATOMY OF HUMAN MOVEMENT

Hours of Credit: 4. (2 hours lecture
1 hour tutorial
4 hours laboratory)

Prerequisites: P. D. 306

Course Objectives: The fundamental and mechanical laws affecting human motor performance; the muscular, skeletal and articular components of the body in relationship to its function as a machine; and the basic anatomical, physiological and mechanical principles as they relate to human motor performance.

Course content:

I. Fundamental Concepts
- Starting positions
- Line and centre of gravity
- Planes and axes of motion

II. The Joints - Structure and Function
- Definitions
- Classifications
- Analysis of joint movements

III. The Muscular System
- Structural classifications
- The action of muscles in movement
- Muscular attachments
- Bones as levers
- Muscle tension
- Types of muscular contraction
- The coordination of the muscular system
- Gravitation and muscle action
- Pulley or tendon action of two-joint muscles
- Electromyography

IV. Neuromuscular Function
- The motor unit
- Muscle innervation
- Muscle tones
- Phasic contractions
- Reflexes
- Volitional movements
- Spasticity of muscles
- Reciprocal innervation and inhibition
- Kinesthetic sense
- Ballistic movements

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 5M/61&167 Gynecology

V. The Spinal Column
- Articulations
- Ligaments
- Whole movements
- Regional movements
- Stability and mobility
- The abdominal wall
- Muscular analysis of head and trunk movements

VI. The Thorax
- Articulations
- Ligaments
- Movements
- Muscles

VII. The Upper Extremity
a) The Shoulder Region
- Structure
- Movements
- Muscular analysis of movements

b) The Elbow Joint and Radioulnar Articulation
- Structure
- Movements
- Muscular analysis of movements

c) The Wrist and Hand
- Structure
- Movements
- Muscular analysis of movement

VIII. The Lower Extremity
a) The Hip Joint and the Pelvic Girdle.
- Structure
- Movements
- Muscular analysis of movements

b) The Knee Joint

c) The Ankle and Foot

IX. Basic Principles of Human Movement
a) The Machinery of the Musculoskeletal System
- The lever
- Body segments as levers
- The wheel and axle
- The pulley
- Efficiency of machines

b) Fundamental Principles of Motion
- Causes
- Kinds
- Motions experienced by body
- Factors determining motion
- Factors modifying motion
- Laws of motion
- Circular motion

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 SM 6/8/67 Kinesiology

c) Fundamental Principles of Force and Work
- Force
- Direction
- Point of application
- Components of muscular force
- Components of external force
- Truce force and resistance arms of levers
- Composite effects of forces
- Work

Selected References:

Steindler, A.: Kinesiology of the Human Body, Springfield, Ill., Charles C. Thomas, 1955.

Gray, H.: Anatomy of the Human Body, edited by C. M. Goss, 27th ed., Philadelphia, Lea and Febiger, 1954.

Bowen, W. P., and Stone, H. A.: Applied Anatomy and Kinesiology, 7th ed., Philadelphia, Lea & Febiger, 1953.

Wright, W.: Muscle Function, New York, Paul B. Hoeber, Inc. 1928.

Morehouse. L.E.: and Miller, A.T.: Physiology of Exercise, 2nd edition, St. Louis, V. Mosley Company 1953.

Morris, H.: Morris' Anatomy, edited by S.P.Shaeffer, 11th ed. New York, McGraw-Hill Book Company, Inc. 1953.

Mathews, D. K., Stacey, R.W. and Hoover, G. N.: Physiology of Muscular Activity and Exercise, New York, The Ronald Press Company, 1964.

King, Barry G., and Showers, Mary Jane: Human Anatomy and Physiology, Philadelphia, W. B. Saunders Company, 1963.

Grant, J.C. B.: Methods of Anatomy, 6th ed. Baltimore, The Williams & Wilkins Company, 1958.

Guyton, A. C.: Functions of the Human Body, Philadelphia, W. B.Saunders Co. 1959.

SM 6/2/69 Kinesiology

Course number: P. D. 320-3

Course title: SOCIOLOGY OF HUMAN MOVEMENT

Hours of Credit: 3. (3 hours lecture
1 hour tutorial)

Prerequisites: Soc. 121

Course Objectives: The cultural aspects of human motor behavior, including the role which games, sports, dance and exercise have played in various cultures; the effects of social institutions on the expressed values of selected cultures toward these activities; and an examination of the pertinent aspects of our present culture which may reflect implications for the future of games, sports, dances and other forms of physical expression.

Course content:

I. A survey of the role physical activity has played on the history of (Western) man.
- Primitive
- Egyptian
- Greek
- Roman
- Middle Ages
- Renaissance
- 17th and 18th Century
- 19th and 20th Century

II. A brief survey of the role of physical activity in selected Eastern Cultures.

III. Trends in present society and their effects and implications upon physical activity.
- Automation
- Leisure - free time
- Prosperity
- Changing role of women
- Teen-age "culture"
- Longer life span
- Over-population
- Urbanization
- Political rivalries and unrest

IV. Social stratification and its relationship to physical activity.

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SM 6/2/67 Sociology

Selected References:

Silvertsen, Helge. The Sports and the Cultural Work of Society. In Sport and Health (pp. 46-48).

Rinvan, Frode. Sport and City Planning. In Sport and Health (pp. 49-51).

Sport for Women. In Sport and Health (pp. 139-151).

Hewes, Gordon W. The Anthropology of Posture. Scientific American, Vol. 196. No. 2 (Feb. 1957) (pp. 123-128, 130, 132).

Huizinga, J. (Johan). Homo Ludens. (A study of the play-element in culture). Boston: Beacon Press (c 1950), Paperback 1955.

Jokl, Ernst. Medical Sociology and Cultural Anthropology of Sport and Physical Education. Springfield, Ill.: Charles C. Thomas, Publishers, 1964.

Jones, Mary Cover. A Comparision of the Attitudes and Interest of Ninth-Grade Students over Two Decades", Journal of Educational Psychology, 5:175-86, August 1960.

Kamlan, Max. Leisure in America. New York: John Wiley & Sons, 1960. (Ch. 14 "Games and Sports as Leisure", p. 189).

Karbe, Wolfgang. "Physical Education and Sports in East and West Germany", The Physical Educator, V. 19, N. 3, Oct. 1962. (pp. 108-113).

L'Heureux, W. J. "Sport in Modern Canadian Culture", JOHPER, V. 35, N.3, March 1964. (pp. 28-29, 61).

Lidster, Miriam. "Ethnic Dance, Medium for Cultural Exchange", Report of 39th Annual Conference WSPECW, 1963.

Malpass, Leslie F. "Competition, Conflict, and Cooperation as Social Values", Values in Sports. Washington, D. C. AAHPER, 1963, (pp. 61-65).

"The Psychology and Sociology of Human Activity", Health and Fitness in the Modern World. Papers presented at the Institute of Normal Human Anatomy Viala Regine Elene, 289 and the Ministry of Foreign Affairs, Rome, Italy. Chicago, Ill.: The Athletic Institute, 1961.

Sachs, Curt. World History of the Dance. N. Y. W. W. Norton, 1937.

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Seagoe, May V., and Ken Murakami, "A Cooperative Study of Children's Play in America and Japan", California J. Educ. Res., 12:124-30 (1961).

Stone, Gregory P. "American Sports - Play and Display", Chicago Review, IX, Fall, 1955. (pp. 83-100).

Stone, Gregory P. "Some Meanings of American Sport", 60th Annual Proceedings, CPEA, 1957. (pp. 6-29).

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Wenkart, Simon, "The Meaning of Sport for Contemporary Man", J. Existential Psychiatry, Vol. III, N. 12, Sp. 1963, (pp. 397-405).

Weston, Arthur. "The Contributions of Labor Leaders to Physical Education", Physical Educator, V. 19, M. 3, Oct. 1962. (pp. 88-92).

Kozman, Hilda, C. Group Process In Physical Education. New York: Harper Brothers, 1951.

Perry, Louis B. "Intercollegiate Sports in Academe", Liberal Education, October, 1963.

Van Dalen, D. B. "Cultural Impact on Physical Education", JOHPER, Dec. 1961. V. 31, N. 9. (pp. 15-17).

Shubik, Martin (Ed.) Game Theory and Related Approaches to Social Behavior. N. Y. John Wiley and Sons, Inc. 1964. (Chs. 1, 3, 5, 23).

Brightbill, C. H. "The Challenge of Leisure", Englewood Cliffs, N. J., Prentice-Hall, 1960.

Wiener, Norbert, "Some Moral and Technical Consequences of Automation Science", Vol. 131, No. 3410, May 6, 1960 (P. 1356).

Brightbill, C. H. "Man and Leisure", Englewood-Cliffs, N. J., Prentice-Hall, 1961.

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Van Vleit, M. L., "Physical Education in Canada", Scarborough, Ontario. Prentice-Hall of Canada, Ltd. 1965.

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Boyle, Robert H. Sport: Mirror of American Life. Boston: Little Brown and Company, 1963.

Green, Arnold. Recreation, Leisure and Politics. New York: McGraw-Hill, 1964.

Hofmo, Rolf. "Sport and Society". In Sport and Health. Royal Norwegian Ministry of Education, State Office for Sport and Youth Work. Oslo, Norway, 1952. (pp. 42-45).

SM 6/2/67 January 9/67

Course number: P. D. 401-4

Course title: MECHANICS OF HUMAN MOVEMENT

Hours of credit: 4. (2 hours lecture
1 hour tutorial
4 hours laboratory)

Prerequisites: P. D. 301

Course Objectives: The characteristics both unique and common, involved in varied human movements; the principles involved in performance of human motor skills, and the methods and techniques of mechanical and functional analyses of human motor performance.

Course content:

I. Principles of Stability
- Centre and line of gravity
- Size of base
- Mass of body
- Momentum and impact of external force
- Fricton
- Segmentation
- Visual and psychologic factors
- Physiological factors

II. Principles of Posture
- Mechanism for maintaining and adjusting posture
- Segmental alignment
- Hereditory factor
- Organiz factors
- Strength and flexibility
- Psychological factors

III. Principles of Moving One's Body
- Whole body movement
- Segmental movement
- Movement when supported by ground
- Movement when supported by water
- Movement when suspended from support pendulum
- Movement when free of support
- Application of force
- Reduction of resistance

IV. Principles of Receiving Impetus
- Avoiding injury
- Maintenance of stability
- Accuracy and control

V. Principles of Giving Impetus to External Objects
- Fundamental movements - pushing, pulling, lifting
- Complex movements - throwing, hitting, striking, kicking.

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 SM 6/4/67 Kinesiology

VI. Principles of Preventing Injury
- Equilibrium
- Range of motion
- Intensity of effort
- Transmission of forces
- Circular motion

VII. Anatomic and Mechanical Analysis of Fundamental Movement Skills
- Skills of moving one's body in different media
- Skills of receiving impetus
- Skills of giving impetus to external objects

VIII. Anatomic and Mechanical Analysis of Common Motor Activities in Sport and Dance
- Gymnastics
- Dance
- Aquatics
- Track and Field
- Combatives
- Racket and other impletment games
- Ball handling skills
- Body contact sports

IX. Measurement and Evaluation of Motor Skill Performance

Selected References:

Wells, Katherine F.: Kinesiology, 3rd ed., Philadelphia, Penn., W. B. Saunders Company, 1960.

Steindler, A.: Kinesiology of the Human Body, Springfield, Ill., Charles C. Thomas, 1955.

Bowen, W. P., and Stone. H. A.: Applied Anatomy and Kinesiology 7th edition, Philadelphia, Lea & Febiger, 1953.

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Duvall, E. N.: Kinesiology: The Anatomy of Motion, Englewood Cliffs, N. J., Prentice Hall, 1959.

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Rasch, Phillip J.: and Roger K. Burke: Kinesiology and Applied Anatomy, Philadelphia, Lea & Febiger, 2nd edition, 1963.

SM 6/x 167
Kinesiology

Course number: P. D. 405-3

Course title: PHYSIOLOGY OF MOTOR ACTIVITY

Hours of credit: 3. (2 hours lecture
1 hour tutorial
3 hours laboratory)

Prerequisites: Bio. 305 (Animal Physiology)
P.D. 306 (Human Anatomy)

Text: Physiology of Muscular Activity and Exercise, Mathews, Stacy and Hoover.

Course Objectives: The role of physiological functions in physical performance; the immediate reciprocal effects of physical performance on physiological functions; and the extent and meaning of long-term functional changes occurring as a result of physical performance.

Course content:

I. The Heart and Circulatory System
- Control of circulation
- Cardiac and circulatory responses to exercise and training
- Measurement and evaluation of circulatory function

II. The Respiratory System
- Respiratory mechanics
- Gas exchange and transport
- Control of respiration
- Respiratory responses to exercise and training
- Measurement and evaluation of respiratory function

III. Musculoskeletal System
- The nature of contraction. Tension. Classifications
- Innervation of muscle
- Muscle metabolism
- Muscular responses to exercise and training
- Measurement and evaluation of muscle function

IV. Nervous System
- General functioning of systems in exercise and training
- Central Nervous System
- Sensory System
- Motor System
- Autonomic System
- Coordination of Systems
- Measurement and evaluation of system function

V. Function of Remaining Systems and the Effects of Exercise and Training on these Systems.
- Digestive System
- Urinary System
- Endocrine System
- Integumentary System
- Lymphatic System

SM 6/16 7 January 64

VI. Physiological Basis of Exercise Programs
- Development of Strength
- Development of Muscular Endurance
- Development of Flexibility
- Development of Cardiorespiratory Endurance

Selected References:

Gray, H.: Anatomy of the Human Body, edited by E. M. Goss, 27th edition, Philadelphia, Lea and Febiger, 1954.

Morehouse, L. E., and Miller, A. T.: Physiology of Exercise, 2nd edition, St. Louis, C. V. Mosley Company, 1953.

Karpovitch, P. V.: Physiology of Muscular Activity, 5th edition, Philadelphia, W. B. Saunders Company, 1959.

Sherrington, C. S.: Integrative Action of the Nervous System, New Haven, Yale University Press, 1948.

Jokl, Ernst: Physiology of Exercise, Springfield, Illinois, Charles C. Thomas, 1964.

Clarke, H. Harrison: Application of Measurement to Health and Physical Education, 3rd edition, Englewood Cliffs, N. J. Prentice Hall, Inc., 1960.

Riedman, Sarah R.: The Physiology of Work and Play, New York, N. Y., Henry Holt and Company, Inc., 1956.

Mathews, D.K., Story, R.W., and Hoover, G.B.: Physiology of Muscular Activity and Exercise, N. Y. The Ronald Press Co. 1964.

King, Barry G., and Showers, Mary Jane: Human Anatomy and Physiology, Philadelphia, W. B. Saunders Company, 1963.

Grant, J. C. B.: Methods of Anatomy, 6th edition, Baltimore, The Williams & Wilkins Company, 1958.

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Tuttle, W. W. and Schotteluis, B. C.: Textbook of Physiology, 14th edition, St. Louis, C. V. Mosley Company, 1961.

Guyton, A. C.: Functions of the Human Body, Philadelphia, W. B. Saunders Company, 1959.

Johnson, Warren R. (Ed.) Science and Medicine of Exercise and Sports, New York. Harper and Brothers Publishers, 1960.

SM 6/2/67

Course number: P. D. 420-3

Course title: HUMAN MOTOR BEHAVIOR

Course credit: 3. (2 hours lecture
1 hour tutorial
3 hours laboratory)

Prerequisites: Psy. 380. P.D. 401. P. D. 320

Course Objectives: The Complex biological, sociological and psychological principles of man as they relate to his motor behavior, and an integrated concept of man as a moving, functioning individual.

Course content:

I. Principles of Neuro-Muscular Coordination
a) Muscular movement cycles
- Contraction, relaxation
- Levels of contraction
- Isotonic - Isometric
- Viscosity
- Ballistic Contraction
- Ballistic - Isometric
- Reversal of function
- Two joint muscle action
- Electromyography

b) Human Movement
- Co-contraction versus ballistic action
- Impulse action
- Co-contraction in ballistic strokes
- Functional limits
- Control and complex control
- Emotional behavior

II. Neuroanatomy and Neurophysiology of Motor Behavior
- The Ganglion Cell and Basic Neuronal Circuits
- Somesthetic sensations
- Control of motor activity
- Transmission of motor signals
- Coordination of motor movements
- Reflex functions of spinal cord
- The special senses

III. Psychological Aspects of Exercise and Sports
a) -Personality Dynamics in relation to exercise and sports
-Theories of motivation
-Motivational variables and personality testing
-Sports and personality dynamics
b) -Mental Health and Motor Behavior
c) -Motor Learning
d) -Academic Performance and Motor Activity

SM 61-62 Kinesiology

STATEMENT IN SUPPORT OF THE FOLLOWING MOTIONS

Motion 1. That the faculty of Education approve the offering of a B.Sc. degree for students successfully completing the interdisciplinary program for the study of human movement.

Motion 2. That the senate be requested to establish an Interdisciplinary Programs Committee to examine all interdisciplinary programs, and to report to the next meeting of Senate on the recommendations of the Faculty of Education that the interdisciplinary program for the study of human movement lead to a B.Sc. Degree.

There are certain distinguishing characteristics and responsibilities that are implicit in any discipline. It must, for example, encourage and carry on extensive research to support and advance existing theories and to lead to new concepts and knowledge. Existing knowledge must be organized and presented in an orderly and systematic fashion through coursework or academic experiences. Each discipline too, must select interested and promising students and encourage them to follow specific programs leading to professional competence. Without these functions and responsibilities it is doubtful if any discipline would continue to advance.

The personnel in the Physical Development Centre are faced with a situation which makes it impossible to carry out two of these functions. The reason why this situation exists are several, but should in no way be construed as truly hampering the possibilities of future development.

The philosophy of the Faculty of Education is one which identifies that the training of a teacher begins first with his mastery of the subject field or discipline he intends to teach. The method of promoting mastery of a discipline involves requiring the student to complete his undergraduate training in existing disciplines within the Faculties of Arts or Science. Following this academic preparation, the student then undergoes a period of professional preparation. This appears to be a sound philosophy and one which is quite compatible with the thinking of the Physical Development Centre.

The difficulty arises, however, when one realizes that the field of physical education has in the past primarily been one of professional preparation. Only recently has the profession begun to realize that there are two aspects to its totality; one, an academic discipline in the true sense of the term, and two, the application of the discipline in a professional or technical sense.

Because of this situation there does not exist within the Faculties of Arts, Science, or Education, a place for the study of the academic discipline of physical education. This means that unless a program for the advancement of the discipline is evolved within the structure of the Faculties of Arts, Science, or Education the discipline can not be studied and as a consequence, students could not be prepared professionally.

SM 6/2/67 Kinesiology

IV. Environment and Motor Behavior
- Climate and exercise
- Work capacity at altitude
- Motor function in sport diving
- Nutrition in motor activities
- Disease and motor activity
- Adaptation to stress and motor activity

Selected References:

Johnson, Warren R.: Science and Medicine of Exercise and Sports. New York: Harper and Brothers Publishers, 1960.

Jokl, Ernst: Physiology of Exercise, Springfield, Illinois, Charles C. Thomas Publishers, 1964.

Nutrition, Exercise and Body Composition. Springfield, Ill. Charles C. Thomas Publisher, 1963.

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Gayton, Arthur C.: Function of the Human Body. Philadelphia, W. B. Saunders Co. 1959.

Crosby, B. C., Humphrey, T.: Louer, et al.: Correlative Anatomy of the Nervous System. New York, The Macmillan Co. 1962.

Krief, W. J. S.: Functional Neuroanatomy. 2nd edition. The Blakston Co., 1953.

Rasmussen. A. T.: Principal Nervous Pathways, 4th edition, New York, The Macmillan Company, 1952.

Note: To a large extent the readings in this course would be drawn from periodicals in the field.

SM 6/2/69 Kinesiology

The problem facing the Physical Development Centre therefore, was to define what in fact constitutes the academic discipline of physical education and then to determine how this field of study might best be incorporated within the existing structure of the University.

The Physical Development Centre after extensive investigation and discussion agreed that the academic discipline of physical education may be identified as being the study of the science of human movement. It was further agreed that the science of human movement is founded upon a number of life and social sciences and that a study of human movement must first begin with a study of the basic concepts in these contributing sciences.

The Physical Development Centre, through a committee established by the President, worked closely with the Dean of Science in the development of an interdisciplinary program for the study of human movement. This program was thoroughly discussed within the department of Biological Sciences and the Physical Development Centre and was then advanced to the Curriculum Committees of the Faculties of Science and Education. The program was accepted in principle by both Committees and was passed back to the President's Committee for further modifications. The program, after refinement, was resubmitted to the Curriculum Committees; it was accepted in principle and in content and was advanced to the Faculty of Science for their approval and acceptance. The Faculty of Science by a vote of 20 to 15 declined to accept the program on the grounds that it did not appear to meet the requirements of a major degree in Science and suggested that the program should be sponsored by the Faculty of Education or such other body of the University that the Senate may recommend.

The President's Committee in revieving the possible actions which could be taken to advance this program following its defeat by the Faculty of Science, recommended to the President that the Senate be requested to establish a committee to examine all interdisciplinary programs and in particular, the program for the study of human movement. It was further recommended that direct action be taken in the advancement of the program and that the Faculty of Education be requested to accept the courses proposed by the Physical Development Centre for the development of the program. The President concurred with these recommendations and suggested that the Faculty of Education be requested to advance these proposals to the Senate. It was further recommended by the President that the Faculty of Education should be requested to go on record as approving the offering of a B.Sc. degree for students following this program and as being willing to offer such a degree if the proposed Senate Interdisciplinary Committee is unable to come up with a more satisfactory solution.

In further support for the above two motions, may I identify the following facts.

1. This program has had extensive discussion amongst a number of groups and has been accepted in principle by both the Faculties of Science and Education, and accepted totally by the Undergraduate Curriculum Committees of both Faculties.
2. The President wholeheartedly supports the program and has recommended the passage of the motions.

SM 6/2/67 Emergency

Support of Motions - Continued

3. The Faculty of Science (A group of 70) defeated the proposed program by a vote of 20 to 15.

4. There are approximately 60 students who are either following the lower division aspects of the program or have indicated they intend to follow the program once it is accepted.

5. The Physical Development Centre was originally charged with the responsibility to develop this program and is prepared to operate the program immediately.

6. There is a definite demand for such a program in the community in that U.B.C. has been unable to meet the demand for the preparation of qualified physical education personnel.

7. The Department of Biological Sciences is in full support of the program and is willing to accept four of the proposed courses as being elective courses for satisfying the requirements for a B.Sc. degree in Biology.

8. That unless this program can be advanced at this point in time the Physical Development Centre stands in jeopardy of losing a number of its faculty, and would have difficulty in attracting future staff.