

ROWAN COLLEGE
CURRICULUM COMMITTEE

(2)

PROPOSAL TITLE: Anthropological Perspectives on Physical Growth + Development

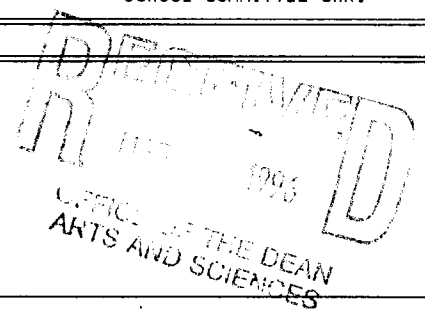
UNDERGRADUATE GRADUATE 3 CREDIT HOURS

SPONSOR(S): Dr. Diane Markowitz and Dept. of Geography/Anthropology

DEPARTMENT & TELEPHONE# Geography/Anthropology, Ext. 3981.

CHECK ONE: COURSE MINOR PROGRAM CONCENTRATION SPECIALIZATION
 ACHIEVEMENT CERTIFICATE CERTIFICATION PROGRAM MAJOR PROGRAM

STEP #1 (DEPARTMENT)	STEP #2 (RECEIPT)	STEP #3 (SCHOOL)
<input checked="" type="checkbox"/> APPROVED/DATE: <u>1/25/96</u> <input type="checkbox"/> NOT APPROVED/DATE: <u>Richard A. Gault</u> DEPT. CURRICULUM CHR. <input type="checkbox"/> REVIEWED/DATE:	SCC# <u>95-96-103</u> DATE RECEIVED: <u>1-24-96</u> <u>Ronald J. Gocher</u> SENATE CURRICULUM CHR.	REVIEWED DATE: <u>2/13/96</u> <input checked="" type="checkbox"/> RECOMMEND TO APPROVE <input type="checkbox"/> RECOMMEND NOT TO APPROVE FORWARD FOR OPEN HEARING <input checked="" type="checkbox"/> WITHOUT RESERVATIONS <input type="checkbox"/> WITH RESERVATIONS COMMENTS: <u>B. L. M.</u> SCHOOL COMMITTEE CHR.

STEP #4 (ACADEMIC DEAN)	COMMENTS:
<input checked="" type="checkbox"/> RECOMMEND <input type="checkbox"/> NOT RECOMMEND <input type="checkbox"/> CONDITIONALLY RECOMMEND (SEE COMMENTS) DATE & SIGNATURE, DEAN OF SCHOOL: <u>RW Bastelt 3/5/96</u>	

STEP #5 (SENATE CURRICULUM COMMITTEE)
DATE OF OPEN HEARING <u>4-24-96</u> APPROVED BY SENATE CURRICULUM COMMITTEE (DATE) <u>4/24/96</u> <input type="checkbox"/> RETURNED TO SPONSOR(S) FOR THE FOLLOWING REASONS: <hr/> <hr/>

#6 (SENATE)
DATE PRESENTED TO SENATE <u>4/26/96</u> <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> NOT APPROVED NOTIFICATION TO EXECUTIVE VICE PRESIDENT/PROVOST (DATE) _____ SENATE CURRICULUM COMMITTEE CHAIR SIGNATURE/DATE: <u>Ronald J. Gocher 5/3/96</u>

STEP #7 (EXECUTIVE VICE PRESIDENT/PROVOST)

DATE RECEIVED MAY 15 1996

APPROVED: YES NO

IF NO, REASONS ARE AS FOLLOWS:

STUDENT CREDIT HOURS 3

FACULTY LOAD HOURS 3

EQUALIZED CREDIT HOURS _____

OFFICIAL COPY & APPROVAL SHEET FILED (DATE) 5/20/96

SIGNATURE, EXECUTIVE VICE PRESIDENT/PROVOST [Signature]

REGISTRAR

DATE APPROVED COURSE DESCRIPTION RECEIVED 5/30/96

HEGIS TAXONOMY AND COURSE NUMBER ASSIGNED 2202.312

DATE/SIGNATURE OF REGISTRAR B2 Kelsey 5/30/96

NOTIFICATION FORWARD:

___ SENATE CURRICULUM COMMITTEE CHAIRPERSON

___ DEPARTMENT CHAIRPERSON(S)

___ ACADEMIC DEAN(S)

___ REGISTRAR

___ SPONSOR(S)

COURSE PROPOSAL:**ANTHROPOLOGICAL PERSPECTIVES ON
PHYSICAL GROWTH AND DEVELOPMENT****1.) Details:**

- a.) **Course title:** Anthropological Perspective on Physical Growth and Development.
- b.) **Sponsors:** Diane L. Markowitz, D.M.D., Ph.D, Department of Geography and Anthropology, and the Geography and Anthropology Department.
- c.) **Credit hours:** 3
- d.) **Course Level:** Undergraduate, sophomore/junior.
- e.) **Curricular Effect:** This course is specifically designed to introduce students to the concepts of physical growth and development, with a view to recognizing normal growth and development among a variety of the world's populations. It will be of particular value to those individuals planning to become involved with children in any professional capacity. It will be a free elective, though it may become required for certain majors (e.g., Psychology).

f.) **Prerequisites:** Human Biology or Anatomy and Physiology. Suggested: Physical Anthropology.

g.) **Time and scale of implementation:**

1.) **Time of implementation:** Spring, 1996

2.) **Scale of implementation:** The course will be offered once per year.

h.) **Adequacy or resources required to offer the course:**

1.) **Staff:** Presently, the faculty member proposing this course is the only individual in the department qualified to teach it. Diane L. Markowitz, D.M.D., Ph.D., has published and presented papers at national and international meetings on the subject of child growth and development and is currently involved in research on growth and development in the Orthodontics Dept. at the University of Pennsylvania School of Dental Medicine.

2.) **Space Needs:** The classroom space currently available to the Geography and Anthropology Department is adequate for the support of this course.

3.) **Library Holdings:** Library holdings are marginally adequate to support offering undergraduate education in growth and development. Though the library does have a selection of works pertinent to this topic, few have been published recently. Ideally, the American Journal of Human Biology should be acquired.

2.) Rationale:

A.) Human physical growth and development historically has been and remains an important subject for physical anthropologists to investigate. Although this course will be geared to the interests of those individuals interested in careers involving the care and education of children, the Geography/Anthropology outlook on the subject will guide the presentation of the subject matter. Human physical diversity, its relationship to ecological conditions and the importance of environment and heredity in shaping the course of growth and development are subjects uniquely suited to a cross-cultural perspective.

B.) Students taking this course can expect to acquire a detailed understanding of the tempo of growth, the meaning of developmental milestones and the effect of the environment, health and heredity on body habitus. Students who have already taken the Psychology Department's course in Child Development will be able to relate the timing and intensity of growth and their relationship to health and nutrition to the appearance of important psychological milestones. Students who have taken Physical Anthropology (recommended) will be able to understand the effect of the environment on the development of trunk/limb proportions, fat patterning and facial growth and development. Understanding the evolution of the variety of growth patterns seen in the world's populations will also be valuable in explaining the issue of work capacity and strength: a subject likely to be of interest to physical education majors. All students will benefit from a basic pre-requisite course in Human Biology, so that discussion may begin with the assumption that students have some familiarity with human anatomy and physiology.

C.) Following the earliest growth studies performed on the children of French factory workers in the 19th century, the originator of modern growth investigations - Franz Boas (the originator of the four-field approach in anthropology and first chairman of the department of anthropology at Columbia University) - demonstrated that all children pass the same developmental milestones, but at a rate affected by heredity, by nutrition, by climate and by interactions of all of these. This course will survey Boas' work and that of the best modern researchers on the subject, particularly Phyllis Eveleth, James M. Tanner and Barry Bogin.. We will examine the evidence for and against a variety of postulated causes of delayed growth, variety in trunk/limb proportions, fat patterning, sexual maturation and development of secondary sex characteristics.

D.) Students must become familiar with the signs of delayed or precocious development in order to recognize them and suggest to parents that a child be examined. Teachers who see a child every day are in a far better position to be the first to suggest a timely intervention than physicians who may see a child only once a year. Also, teachers who understand the normal development of secondary sex characteristics will be in a better position to predict and deal with expected changes in behavior peculiar to puberty.

E.) Teachers must be aware of the range of normal variation in growth and its tempo in order to adjust expectations of appropriate behavior for children. Well-nourished groups feature an impressive variety of normal body types and sizes. A child who is large for his age, for example, may present the appropriate proportions and physical and mental development for one of his chronological age: yet such a child is frequently expected (unreasonably) to behave in a very mature fashion. This is an error made frequently by those unfamiliar with the full range of normal development.

New Jersey, as do many other states, has a large number of temporary agricultural workers, some of whom bring their families. If - and we hope they do - send their children to school, many graduates of Rowan are likely to teach them. If these children are significantly smaller than others, teachers should have some means of evaluating the cause of their small size. Is short stature genetic and therefore of minimal concern, the result of early malnutrition (the effects of which will now be eradicated through catch-up growth in a more plentiful environment), or the continuing effect of malnutrition which may also affect a child's performance in school or some combination of all of these?

Special education teachers should be aware of the effects of developmental abnormalities on their students as well. Delay seen in some congenital syndromes affects mental function but not necessarily hormonal function. Others, such as Allbright's Syndrome or adrenal hyperplasia may affect development but not intellectual ability.

Physical education teachers are required to teach health and nutrition in order to improve immediate and long-term health in their students. They should know that a body habitus - for example, a pattern of centralized body fat deposition - that is perfectly normal for one group (Native Americans and many Hispanics) may also be associated with increased risk for disease in adult life.. Also, a child of African origin with small-average size parents who tracks consistently in the lower 3rd percentile for height may be displaying a growth delay of greater concern than if that child were of European or Asian origin.

F.) In this regard, students in this class will also become familiar with the methods for charting growth and the benefits and disadvantages of each. For example, in order to determine the health of an **entire population**, cross-sectional studies are performed in which each child is only measured once and the mean of measurements for all children of a particular age range is considered to be "normal" for that sample. The norm for that age group for that sample is then compared with the corresponding "norm" of a reference sample. But the choice of a reference sample represents a difficult and important decision. If the population under study is well-nourished, it may be appropriate to compare it with any reference sample of well-nourished children. If the study group is poorly-nourished, the most appropriate comparative reference sample is a well-nourished group of the same ethnic background. This type of study, whose results are often used to determine a putative "norm" for a particular population, is completely inappropriate for comparison with the growth trajectory of an individual child.

If, on the other hand, the objective is to determine the health of **one child**, a longitudinal study (which follows individual growth curves throughout each individual's subadult years) is the appropriate comparative means to determine the tempo of growth. Parents are frequently told that the "normal" age of menarche for girls is 12, yet they fail to understand that this is simply a population mean, and that 10 and 14 are just as "normal". Teachers should be able to interpret such statements often made by parents after their child sees the physician.

G.) Teachers need to be able to examine growth studies critically to determine their validity in use. In this course, students will also become familiar with some of the more useful means of forecasting growth, including dental and skeletal age and growth equations. Although students will not derive or prove the validity (or lack of validity) of these equations, they will become familiar with the benefits and drawbacks of each.

H.) Finally, students eventually will gain some experience in acquiring growth data on their own in order to evaluate the difficulty of developing accurate information for analysis. It is hoped that, within the foreseeable future, a scale, an accurate height measuring device and more skin-fold calipers can be obtained. With these instruments, students will practice on each other and then on available children - with the cooperation of the education department and the Human Subjects Research Committee - in order to produce their own limited study of growth. I hope to arrange field trips for students to the Gastroenterology and Nutrition Department at Children's Hospital of Philadelphia, the Turner Nutritional Awareness Project of the University of Pennsylvania and/or the Miller Clinical Research Center at the University of Pennsylvania School of Dental Medicine (where I do research)..

3.) **Essence of the Course:**

a.) **Objectives of the course:** Upon completion of the course, Anthropological Perspectives on Physical Growth and Development, students will be able to:

- 1.) outline the full range of normal milestones of growth seen in the healthy child.
- 2.) understand normal physiologic and anatomic maturation and the hormonal influences on them.
 - a.) explain the normal function of the hypothalamic-pituitary-gonadal axis: explain the elaboration of growth and sex hormones and the influences of the endocrine system on growth.
- 3.) be able to note when those milestones are not being achieved in a normal fashion.
 - a.) describe the effects on somatic, genitourinary, neural, lymphatic and adipose tissues.
- 4.) describe a variety of factors which may delay the tempo of growth: illness, disease, stress, treatment with steroids (?), malnutrition, high altitude (?), heredity (?).
- 5.) understand the mechanism by which these factors may interfere with growth.
- 6.) outline the methods used in forecasting and determining growth: this includes the charting of weight and height (and the derivation of the body mass index), trunk/limb proportions, head circumference, the appearance of secondary sex characteristics, the use of such equipment as skin-fold calipers, ultrasound machines and bio-electrical impedance devices to determine lean body mass, and dental and hand-wrist x-rays to examine dental and skeletal age.
- 7.) describe and intelligently criticize the benefits and shortcomings of the most often-used equations for forecasting growth.
 - a.) critically assess the validity of major growth studies in the literature.
- 8.) describe the phenomenon of catch-up growth and explain in what circumstances it may be seen.
- 9.) describe and understand the effects of heredity, environment, malnutrition and disease on body habitus (including stunting and wasting) and the passage of developmental milestones.
 - a.) be able to explain the effects of kwashiorkor, marasmus and protein-calorie malnutrition.
- 10.) become familiar with some of the known effects (in adulthood) of alterations in the tempo of child growth and development and in fat patterning.
- 11.) describe the major inter-population differences in tempo of growth, fat distribution, trunk/limb proportions and attained adult stature and be able to relate these to climate, altitude and heritability.
- 12.) understand the effects of illness, both infectious and non-infectious, on growth and development.
- 13.) describe and explain the secular trend in tempo of growth among well-nourished, industrialized populations in pubertal development and final attained height.
 - a.) understand its implications for adolescent behavior.

b.) Topical Outline:

- A.) Growth in general outline: endocrine influences
 - 1.) Scammon's curves and their meaning
 - 2.) the hypothalamic-pituitary-gonadal axis
 - a.) hypothalamic endocrine factors
 - b.) the influence of the thyroid and parathyroid
 - c.) the influence of the liver
 - d.) the influence of the pituitary
 - e.) the influence of the gonads
 - 3.) circulating growth factors
 - 4.) bone matrix growth factors
 - a.) the normal processes of bone growth
- B.) The evidence:
 - 1.) longitudinal growth curves.
 - 2.) cross-sectional growth curves.
 - 3.) Tanner stages: secondary sex characteristics.
 - 4.) radiographic evidence:
 - a.) dental age: Moorrees, Fanning and Hunt method, Demirjian method.
 - b.) skeletal age: Greulich and Pyle method, TW2 method.
- C.) Delaying influences:
 - 1.) malnutrition and infectious disease.
 - a.) kwashiorkor
 - b.) marasmus (protein-calorie malnutrition).
 - c.) mild-moderate malnutrition
 - 2.) failure to thrive.
 - a.) poor child/caregiver interaction.
 - b.) Duchenne muscular dystrophy.
 - c.) other causes: coeliac disease, juvenile diabetes, steroid medication, etc.
 - 3.) heredity
- D.) Forecasting growth: assessment of the most frequently used equations.
- E.) Catch-up growth.
 - 1.) likelihood of occurrence.
 - 2.) conditions of its effect.
- F.) Inter-populational variety in
 - 1.) tempo of growth.
 - 2.) attained height.
 - 3.) body habitus
 - a.) fat patterning
 - b.) trunk/limb proportions.
 - 4.) effects of adaptation and acclimatization.
- G.) Anthropometric and other types of measurements:
 - 1.) height
 - 2.) weight

3.) lean body mass

H.) The secular trend : what it is, how it arose and implications for the future.

I.) Positive deviance: the healthy child in a poor environment...why?

c.) Evaluation of Students:

Initially, familiarity with the major issues outlined above will require careful study of specific issues in human growth and development. Mastery of these subjects will be gauged via two hour-long examinations given after the first and second thirds of the course. By the end of the course, students should have sufficient acquaintance with the major issues to effectively criticize descriptions of actual growth studies. Students will be asked to choose a topic in growth and development and, using the library's resources (American Journal of Human Biology and the American Journal of Physical Anthropology) to write a paper, focusing on an issue in growth and development of interest to them.

d.) Course evaluation: Success in inculcating the requisite information and the students' perception of the quality of the course will be gauged via the SIR form and a specialized questionnaire developed for the course.

4.) Results of consultations:

a.) Consultation with departments offering courses with similar titles. Consultation with department heads and appropriate faculty members was solicited.

b.) Names of those who were consulted: Dr. Christy Faison, Mr. James Burd, Dr. John Frisone, Dr. Laurreta Reeves, Dr. Elizabeth Moore, Dr. Maria Tahamont.

c.) Copies of written replies to requests for consultation. Copies of written replies are appended.

5.) Additional information:

Suggested texts:

Foetus into Man by J.M. Tanner

Worldwide Variation in Human Growth by Phyllis B. Eveleth and James M. Tanner

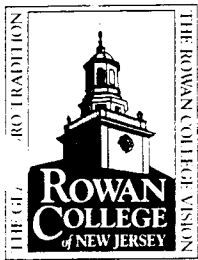
Patterns of Human Growth by Barry Bogin

Malnourished Children in the U.S.: Caught in the Cycle of Poverty: Robert B.

. Karp (ed.)

6.) Catalogue description:**Catalogue Description:**

Anthropological Perspectives on Physical Growth and Development examines the normal course of human physical growth and development and inter-population differences in attainment of puberty and final adult height, weight and body shape. It also focuses on the effect of the environment, heredity, disease and nutrition in producing a variety of fat patterns, trunk/limb proportions and delays in growth in different human groups. Finally, students learn to assess critically different types of growth studies and methods of forecasting growth.



Rowan College of New Jersey

201 Mullica Hill Road
Glassboro, New Jersey 08028-1701

TO: Dr. Diane Markowitz
Geography/Anthropology Department

FROM: James Burd, Chair *JB*
Department of Health and Physical Education

RE: Course Proposal - Anthropological Perspectives on
Physical Growth and Development

DATE: December 5, 1995

The Department of Health and Physical Education upon review of your course proposal Anthropological Perspectives on Physical Growth and Development, supports its passage by the School of Liberal Arts and Sciences and Faculty Senate Curriculum committees. Our department sees the value of this course, particularly for those students who will be dealing with children.



Rowan College of New Jersey

221 Mullica Hill Road
Glassboro, New Jersey 08028-1701 • (609) 256-4870

Psychology Department

November 1, 1995

Dr. Diane Markowitz
Geography/Anthropology Department
Rowan College
Glassboro, New Jersey 08028

Dear Diane:

I have reviewed the new course proposal for "Anthropological Perspectives on Physical Growth and Development," and support its approval. It is a well-designed course which has both intrinsic and applied academic value. While your proposed course builds on concepts discussed in the Psychology Department's Child Development course (which I teach), its concentration on anatomical and physiological aspects of growth is very different from the broad array of psychological topics covered in Child Development.

Sincerely,

Laretta Reeves, Ph.D.
Psychology Department
ext 3523



Rowan College of New Jersey

201 Mullica Hill Road
Glassboro, New Jersey 08028-1701

Biological Sciences Department • (609) 256-4833

TO: Dianne Markowitz
Geography & Anthropology Department

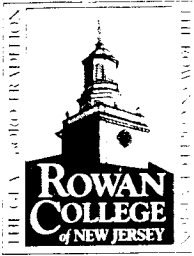
FROM: E. J. Moore *E.J.M.*
Chairperson, Biological Sciences

RE: Course Proposal

DATE: November 15, 1995

Thank you for giving our department the opportunity to review your course proposal entitled "Physical Growth and Development."

At our meeting on November 8, 1995, the members of the Biological Sciences department voted to endorse your proposal.



Rowan College of New Jersey

201 Mullica Hill Road
Glassboro, New Jersey 08028-1701 • (609) 256-4870

Psychology Department

November 28, 1995

Diane L. Markowitz, D.M.D., Ph.D.
Geography/Anthropology Department
Rowan College of New Jersey
Glassboro, NJ 08028

Dear Diane:

I have reviewed your course proposal, "Physical Growth and Development." As I read your very complete and interesting rationale, I asked myself, "Why is this course not already a reality?" It fills a huge gap: we have courses in child and adolescent development, but the present offerings cannot by themselves provide students an opportunity to study in detail the ways that maturational changes in cognition, behavior, and affect are related to physical development. In my opinion, your course is a perfect complement to the Psychology Department offerings in psychological development. I believe that this course should be taken by all of our students studying child and adolescent development, perhaps by all psychology majors.

I enthusiastically support this course.

Sincerely,

John Frisone, Ph.D.
Chairperson, Psychology Department



January 29, 1996

Dr. Diane L. Markowitz
Geography/Anthropology Department
Rowan College of New Jersey
Glassboro, N.J. 08028

Dear Dr. Markowitz:

I write in support of your course proposal, "Anthropological Perspectives on Physical Growth and Development." You have written an excellent proposal for an important course that would be of great benefit to students of human development. Issues concerning physical development addressed by this course proposal are frequently neglected in discussions of psychological and emotional development, learning disabilities, variability in intelligence testing scores, and cultural and gender differences in development. Your course would add valuable information to a student's understanding of development.

When your course is part of the curriculum, I will strongly encourage my advisees to register for it. This is an ideal elective for Psychology Department majors. You have made a valuable contribution to the college curriculum by developing this exceptional course proposal.

Thank you for the opportunity to review this proposal.

Yours truly,

Linda R. Jeffrey

Linda R. Jeffrey, Ph.D.
Professor

SENATE

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RECEIVED