

UNIVERSITY OF MINNESOTA  
Graduate School

Minutes of Executive Committee  
Tuesday, October 12, 1971  
11:30 A.M. Campus Club

Present: the Chairmen of the Six Policy and Review Committees: Professors Paul Johnson, Education & Psychology; Frank Ungar, Health Sciences; Robert J. Schork, Language, Literature, & Art; Stephen Prager, Physical Sciences; Donald Rasmusson, Plant & Animal Sciences; Robert Scott, Social Sciences. Graduate Student Representatives: Julie Belle White, Lorelei Hanson, and Mary Ebert. Deans Francis Boddy, Harry Lease, Luther Pickrel, Millard Gieske; Professor Robert Dykstra and E. W. McDiarmid. Dean Bryce Crawford, Jr., presiding; Shirley McDonald, secretary.

1. Graduate Degree Programs

Dean Crawford reported that the following programs, new or modified, received final action and approval by the Board of Regents during the summer and early fall:

	<u>Approved</u>
A. Certification Program, Special Learning Disabilities at Duluth	6/12/71
B. M.S. in Chemistry extended to include Plan B at Duluth	7/09/71
C. Ph.D. with major in GeoEngineering	7/09/71
D. M.S. with major in Nursing (replaces Medical-Surgical and Psychiatric Nursing majors)	7/09/71
E. M.A. with double major in French & Italian	6/12/71
F. M.S. with major in Physical Therapy extended to include the Plan B program	9/10/71
G. M.S. & Ph.D. with major in Oral Biology	10/08/71
H. M.S. with major in Medical Microbiology at <u>Mayo</u> (Rochester)	10/08/71

The following new and modified programs, recommended by the Policy and Review Committees were brought before the Executive Committee for action:

- A. Plan B program in English at Duluth - a modification: a proposed "internal" minor. The student may offer 6 to 12 credits in American Literature or English Language to satisfy one of the related fields. This does not establish a precedent; the "internal" minor exists in a number of fields including English offered on the Minneapolis Campus.

The Executive Committee approved and the modification in the Duluth program will be reported for information and bulletin copy. HECC and Regents action is not required.

B. M.S. with major in Medical Microbiology - Twin City Area

There is a need for trained personnel in laboratory and diagnostic services of hospitals and clinics in this country. The purpose is to train students who are interested in medical microbiology, in advanced concepts and methodologies in medical bacteriology, virology, mycology, parasitology, and immunology. Special emphasis will be placed on laboratory methods relevant to these areas.<sup>1</sup>

The program will include an internship or preceptorship for Twin City students in laboratories in several hospitals. Each has a specific laboratory for a specific emphasis. The program will be offered under Plan B since a project will be required, rather than a thesis.

The Medical Sciences Group Committee deferred action at its last meeting in May pending some input by the departments of Medical Technology and Laboratory Medicine about possibility of overlap and for some knowledge of the responsibility and commitment on the part of hospital personnel who would be involved with the internships.

Professor Ungar reported that a subcommittee of the old Medical Sciences Group Committee and the new Policy and Review Committee for Health Sciences met to consider the additional information requested. The questions were satisfied and the subcommittee recommended acceptance of the program.

The Executive Committee approved the program; the complete proposal will be referred to the HECC for review; final action must come from the Board of Regents.

- C. Ph.D. with a major in Biomedical Engineering (minor for the M.S.) Biomedical Engineering is an interdisciplinary field in which the principles of engineering science are applied to systems and problems which are of biomedical interest. The proposal states that a graduate program would "benefit the University by providing increased flexibility in bioengineering training and clearer identity for the existing bioengineering activities." The training can be best provided through the Ph.D. degree since it would service students with backgrounds in physical sciences who want complementary training in the biological sciences and students with backgrounds in biological sciences who need in-depth training in the engineering

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<sup>1</sup>from the proposal

sciences. The student would choose a traditional minor (as opposed to the supporting program) and it would be this department which would house the student and probably offer support since separate funding for bioengineering is not available at this time. The minor would usually be the department of the student's undergraduate major and of his adviser. The proposal has been reviewed by the Physical Sciences, Health Sciences, and the Plant and Animal Sciences Policy and Review Committees. Professor Ungar, for Health Sciences, reported that the Committee approved the proposal in principle; Professor Rasmusson said that the Plant and Animal Sciences P & R Committee support the proposal generally, but feel that the individual student programs should be assigned to one of the established Unit Committees for processing rather than the separate subcommittee suggested in the proposal. Professor Prager, for Physical Sciences P & R, said that this Committee also supports the proposal in general, but here is a question as to whether this program is taking advantage of resources available in other bio-related areas in IT, particularly Chemistry and Physics. The Executive Committee approved the proposed program, with the proviso that the above stipulations be taken into account in the final formulation of the proposal.

Preliminary notification will be forwarded to the HECC and the final proposal will follow as soon as it has been prepared. Final approval must come from the Board of Regents.

The following new or modified graduate programs are receiving preliminary review by the Policy and Review Committees:

A. M.S. with a major in Family Planning and Population Studies.

There is a demand for personnel trained to establish and operate family planning programs in the United States and in other countries. The University of Minnesota has resources available to provide this kind of training through a Master's degree program; some of the areas involved would be Obstetrics and Gynecology and other divisions in the Medical School, Public Health, and Sociology.

The proposal has been referred to the Health Sciences and Social Sciences Policy and Review Committees. The Plant and Animal Sciences Policy and Review Committee may also have an interest and a copy of the proposal has been sent to the chairman, Professor Rasmusson. Professor Ungar reported that the Health Sciences Committee has appointed a subcommittee to meet with Dr. Harry Foreman, Director of the Center for Population Studies, to discuss the proposal. The item will be carried forward.

B. A Cooperative Program for Administrators.

This is a proposal for a joint program between the Division of Educational Administration at the University of Minnesota and the Department of Education at Moorhead State College. The proposal states that the primary purpose of the program is to "prepare elementary and secondary school administrators, both at the principal and superintendency levels, to meet the certification requirements of the State of Minnesota. The professional administrator's certificate requires the minimum preparation of a Specialist Degree in School Administration earned in a recognized graduate school." Moorhead State cannot offer the Specialist Certificate at this time and this cooperative program would provide a means by which students from Northwestern Minnesota could jointly plan a Master's Degree and a Specialist Certificate. The University courses offered at Moorhead State would be through the General Extension Division and the Graduate School.

The proposal has been referred to the Education and Psychology Policy and Review Committee and the item will be carried forward.

C. Specialist Certificate in Library Science.

This program is intended to replace the existing Specialist program in Library Science Teaching. It is a modification of that program in that it would extend the training beyond that of the teaching of Library Science. This program, with field unspecified, would provide the opportunity for students to decide on their own specialty. For example, one student might be interested in machine use in libraries; another might wish to specialize in rare books.

The proposal was discussed at the June meeting of the Social Sciences Group Committee. While the Committee approved the proposal in principle, it was suggested that it go before the new Policy and Review Committee in light of the current interest in professional degree programs by the Graduate School. It has now been referred to the Social Sciences Policy and Review Committee and will be carried forward pending a recommendation.

Program Proposals for the following may be forthcoming:

- A. A New Program in Public Affairs or a Redesignated Major
- B. A Master of Social Work at Duluth

Dean Lease said that a program and curriculum proposal will be ready for the Duluth Graduate Faculty Committee about the 1st of December; it should come to the Graduate School in January.

C. An M.A. with a major in Latin American Studies

The HECC guidelines have been sent to the proponents of the proposal.

The following program proposal has been withdrawn:

A. The MAT in English at Duluth

Dean Lease said that this proposal will be resubmitted, probably as an extension of an existing program.

2. The Graduate Student Council

Dean Crawford commented on the fine job three of the Council's Officers did with an orientation session, an information table, and a social hour for graduate students. The Council can certainly be useful to the students, the various faculty committees, special and ad hoc committees and to the Graduate School. The three students, Julie Belle White, Mary Ebert, and Lorelei Hanson prepared a report of the recent activities and this was distributed to members of the Executive Committee.

Julie Belle White summarized the purposes of the Council. The first meeting of all of its delegates will be held on October 21st. The Council hopes to be the students' power source and their assimilation and information source; it can be useful to the Policy and Review Committees through their student representatives. Julie Belle White said that currently, the Council is headquartered in the Student Activities Bureau. She inquired as to the possibility of space for the Council headquarters in the Graduate School; Dean Crawford said this would indeed be desirable and that the matter will be explored. At the time of this meeting, student representatives had been selected for the Health Sciences and the Physical Sciences Policy and Review Committees. The others are proceeding with the selection of representatives.

Miss White said that less than one-third of the departments have graduate student organizations at this time. She, along with Lorelei Hanson and Mary Ebert will sit with the Executive Committee until other representatives have been selected.

A portion of the report is attached to these minutes.

3. New Unit Committees "Start-Up"

The newly organized Graduate School committee structure, as recommended by the Task Force on Graduate School Reorganization, is in

operation. Two meetings with Unit chairmen were held early in October. The logistics of handling the student programs and related materials were established. Some suggestions by the Unit chairmen were incorporated.

Dean Crawford said that unless there is some real objection, the requirement of the 250-word thesis outline to accompany the thesis title form will be mandatory in all fields. In the past, all but two of the group committees required the outlines. This will not only ease the handling of materials for the Graduate School, but will help the Unit Committees with the assignment of the final oral examining committees.

The dean stressed the importance of the Unit Committees making their recommendations on the student materials and the A-1 and A-2 nominations to the Graduate Faculty as a committee and not by separate individual actions; since there are now 24 Units to handle this work formerly assigned to 7 group committees, it might be reasonable to expect each Unit Committee to meet once a month for an hour or two.

A new edition of the Graduate Faculty listing is to be published soon; Dean Crawford asked that the Units and Policy and Review Committees meet early to take care of the backlog, from summer and early fall, so that the book can be as up-to-date as possible.

A memorandum, explaining some of the basics of processing student materials and including some related policy changes has been sent to the Graduate Faculty.

4. Committee on Graduate School Admissions Policies

This committee, chaired by Professor William Martin, will have a report of specific recommendations ready within the month. The draft has been completed, but there are some supplements to be included. This ad hoc committee will be continued, reconstituted as a standing Committee on Admissions; it will be useful to the Graduate School and faculty, especially on matters of general policy questions related to admissions.

5. Committee on Doctoral Programs

This Committee, chaired by Professor Warren Loud, has its report in preparation. Probably this Committee also will be reconstituted, with some new specific charges. The Doctor of Arts may be explored to see if this designation would be useful at Minnesota for students who wish to teach in Universities rather than conduct research. Dean Crawford also hopes that the great variation in practices by fields in administering the doctoral program at Minnesota can be reviewed and ideas exchanged; some overall guidance about purposes and directions for the Ph.D. may be desirable.

6. Admission to the Preliminary Oral Examination

Dean Crawford reported that procedures for admission to the preliminary oral examination have been simplified. In the past, the Graduate School has held for completion of the minor or supporting program, language (if required), and the passing of the preliminary written examinations in the major field. More often than not, the checking of the file revealed a number of deficiencies which required petitions causing inconvenience to both student and faculty. Since many exceptions were granted, the Graduate School has agreed to admit the student to the examination upon receipt of the report of written preliminary examinations in the major -- signed by the adviser and the Director of Graduate Studies, certifying successful completion of these examinations. The examination must be scheduled in the Graduate School Office at least a week in advance; the students will be notified of any deficiencies and they will be expected to take care of them as soon as possible. This policy change is described in the mailing to the Graduate Faculty.

7. Tuition and the Course-Credit Module

When the course-credit module was changed, it affected many graduate students who normally register for 6 credits or less and pay half the normal tuition rate. The Graduate School sought and received approval for such students to be allowed to pay the half tuition for 6 credits or less or 2 courses or less. Dean Crawford pointed out that a laboratory course, which has a separate number and specifies credit counts as a separate course for this kind of registration.

8. Minimum Credit Requirement and the Course-Credit Module

The Master's Degree, Plan A calls for 18 credits in the major and 9 credits in the minor. The Plan B calls for a total of 45 credits with a minimum of 21 in the field of concentration and a minimum of 18 in the related fields. These minimums fit the 3-credit module; but they are not divisible by 4 or 5. As a result, the Graduate School is getting queries and requests for a reduction in the above minimums.

Dean Crawford reported that the credit minimums will obtain - requests to reduce them because of a "numerical accident" cannot be approved.

9. Full-time and Part-time Graduate Students

Dean Pickrel commented on the variety of administrative problems in the identification of the part-time vs. the full-time graduate student. A number of factors can affect the definition of the FTE (full-time equivalent): tuition and fees paid, minimum-credit requirement for foreign students to satisfy immigration authorities,

etc. A student who is working on his thesis may be certified as carrying a full load; the change in the course-credit module will have its effects; holding an assistantship may expedite the student's progress toward the degree, or it may slow it down.

There are a number of areas which have many part-time students, especially in the engineering and education fields. The Extension programs at Rochester and the UNITE (University Industry Television for Education) will raise questions as to how many part-time students are involved in these programs.

Dean Crawford reported that a committee will be appointed to work out procedures by which a more realistic identification of part-time, full-time students can be accomplished.

10. Status of Budget Planning and Graduate Program Review

Dean Crawford said that response to the "crash program" for Retrenchment and Reallocation of funds (R & R) varies between colleges. The Policy and Review Committee members working with their own departments on recommendations for R & R may not have time to have much impact on plans for the rest of this biennium, but can certainly use the recommendations for the longer range in-depth review of graduate programs.

The discussion turned to possible criteria or guidelines, first to help identify programs for review and then to apply to the actual in-depth study. The dean said that the Graduate School would hesitate to establish guidelines since they tend to be restrictive; the Policy and Review Committees may wish to develop their own guidelines and procedures. He mentioned the subcommittee structure and set of criteria which the Physical Sciences P & R Committee is using to initiate program review in that area. The guidelines for the development of new graduate programs by the Minnesota Higher Education Coordinating Commission (HECC) may be useful. The dean said that procedures for program review followed by several universities will be duplicated and sent to the Policy and Review Committee chairmen and graduate student representatives on the Executive Committee.

There will be differences in procedures followed between the Policy and Review Committees, but interchange of information and ideas between them should be helpful. Communication with the Units is important too -- a good way to keep abreast of what is going on in different fields is to have a look at, say, the last 12 or so individual student programs in a field from time to time. Policy and Review Committee chairmen may request programs by contacting Mrs. LaVerne Wagner in the Graduate School Unit Committee Office.



Dean Crawford stressed the point that in-depth reviews should not be restricted to programs which appear to be in trouble; these periodic reviews should serve to strengthen programs, not to cut nor to eliminate them.

Professor Johnson raised a question: when a program has been identified for a review, who is to serve as its advocate? Dean Crawford said that there should be no rigid policy; he made the following suggestion: perhaps a subcommittee could be appointed, to be in close touch with the Policy and Review Committee, and to include one or two faculty members and graduate students from the program field, from an adjoining field, and from a field not so closely related. The dean asked to be informed, if this procedure is to be used, so that he may touch base with the appropriate college dean to avoid possible duplication of effort in this regard.

Dean Crawford suggested that the Policy and Review Committees may wish to call in experts from outside the University of Minnesota for their views and recommendations on graduate degree programs.

In any event, the Policy and Review Committees will want to explore the whole question, considering objectives, criteria, and procedures before initiating the on-going program review function.

In the original recommendation for several graduate programs established recently, early reviews were suggested; these include the programs in Italian, Family Practice and Community Health, and Pharmacy Administration. Master's degree programs in the Physical Sciences will also be studied by a committee which Deans Swalin and Crawford have appointed. Dean Gieske suggested that the Rochester programs also be included in this review.

11. Post-baccalaureate Education and Training

Dean Boddy reported that the subcommittee appointed to study the question of post-baccalaureate programs will present an oral report to the Senate Committee on Educational Policies (SCEP) soon; a written preliminary report will be published but probably not before the end of the fall quarter.

The meeting was adjourned.

October 18, 1971

Respectfully submitted,  
Shirley McDonald  
Secretary

COUNCIL OF GRADUATE STUDENTS  
University of Minnesota

There are approximately 8,000 graduate students attending the University of Minnesota. They constitute the second largest group of students, yet until this year they had no official organization to represent them. In January of 1971 Dean Crawford met with over 50 representatives from graduate student department organizations. As a result of this meeting, a steering committee was formed which accomplished several major steps during spring quarter. A Constitution and Bylaws were written, proposed and accepted. The organization, named the Council of Graduate Students, was formally recognized by the Student Activities Bureau. A survey of the status of graduate students in their departments was conducted revealing great differences from area to area, and a list of representatives to the COGS was drawn up. During the second week of the fall quarter the first meeting of all the duly chosen representatives will be held.

The following principles were stated by the Steering Committee as justifications for establishing a council to represent the graduate and professional student body:

1. To assimilate, coordinate, and disseminate information to all graduate students;
2. to make the Council of Graduate Students part of the Graduate School structure and organization;
3. to provide student representatives for University committees;
4. to make the graduate students aware of mutual problems and to help find solutions for these problems;
5. to unite the forces of all graduate and professional students, thus making a powerful, formally recognized body to represent and negotiate for all graduate students.

Certainly many problems concern only the members of an individual department, but for more universal matters the unified power of one strong organization may be much more effective and efficient than the attempts of single individuals. We also hope that you will support COGS. Bring your problems to us; we are here to serve you.

Questions concerning the Council of Graduate Students should be directed to Dr. Matthew Stark, advisor, Council of Graduate Students, Room 121 Temporary North of Mines. Telephone 373-4182.

July 21, 1971

Dean H. Harry Lease:  
20 Administration  
University of Minnesota  
Minneapolis, Minnesota 55412

Dear Dean Lease:

The minutes of the meeting of the Board of Regents for June 12, 1971 have been received in Dean Crawford's Office. Gladys Upham pointed out an item which includes the formal approval of the Four-Bachelor's Level Certification Program in Special Learning Disabilities at Duluth. The proposal was submitted to the NBOC and, apparently, received a positive recommendation.

We will recall that the proposal was discussed at the May 21, 1971 Duluth School Executive Committee meeting. It was approved with the understanding that all requirements of the regular M.A. degree will be met since this program is a specialization which will be available through the existing M.A. in Education.

The approval, by the Board of Regents, will be reported for the record at the first fall meeting of the Executive Committee.

I will appreciate your informing interested persons of this approval.

Sincerely yours,

Shirley McDonald  
Prin Exec Secretary

UNIVERSITY OF

Minnesota

copy to Skid

cc: F. Boddy

*(Handwritten initials in a circle)*

MAR 4 1971

OFFICE OF THE VICE PRESIDENT, ACADEMIC ADMINISTRATION  
213 MORRILL HALL • MINNEAPOLIS, MINNESOTA 55455

February 24, 1971

Mr. Richard C. Hawk  
Executive Director  
Minnesota Higher Education  
Coordinating Commission  
Suite 400, Capitol Square  
550 Cedar Street  
St. Paul, Minnesota 55101

ATTENTION: Dr. Donald P. Draine

Dear Mr. Hawk:

By authorization of the Board of Regents, I am transmitting to you materials which describe a formal proposal for Special Learning Disabilities at the University of Minnesota, Duluth. This proposal is forwarded to you now for consideration by your Curriculum Advisory Committee. I am sending you 25 copies of the proposal for your distribution.

Sincerely yours,

*William G. Shepherd*

William G. Shepherd  
Vice-President  
Academic Administration

WGS/ska

cc: Donald K. Smith

Attachments

CC Number 276  
Dep't. Action 1-9-70  
Division Action JAN 23, 1970  
CC Action 2-24-70

TO: Curriculum Committee

FROM: Department of Special Education

SUBJECT: Request for Approval of Post-bachelor's Level Certification Program  
in Special Learning Disabilities (SLD)

I. Catalog Description

SPECIALIZATION IN LEARNING DISABILITY

Elementary and secondary teachers wishing to specialize in learning disabilities will need to complete a minimum of 33 quarter hours of specified course work and one year of supervised field experience for certification as an SLD-Learning Disabilities teacher. This program may be taken at either the adult special or graduate levels. Prospective candidates should consult with program adviser to make formal application for admission to the program.

The candidate and the adviser will plan a program of studies according to the following guidelines:

Foundation Studies (12 quarter credits)

SPED 5-378 Education of Learning Disabled Children  
SPED 5-251 Language Disorders in Children  
PSYF 5-611 Psychology of Human Learning  
Electives:  
PSYF 5-311 Advanced Child Psychology  
PSYF 5-111 Personality and Mental Hygiene  
EDUC 5-305 Measurement in the Classroom  
SPED 5-220 Education of Exceptional Children  
EDUC 5-305 The Culturally Disadvantaged Pupil  
SPED 5-250 Normal Language Development

Instructional Clinical Skills (21 quarter credits)

EDUC 5-370 Reading Disabilities  
EDUC 5-672 Practicum: Reading Diagnosis  
EDUC 5-673 Practicum: Reading Remediation  
SPED 5-374 Learning Disabilities I  
SPED 5-675 Practicum: Learning Disabilities I  
SPED 5-376 Learning Disabilities II  
SPED 5-677 Practicum: Learning Disabilities II

II. Reasons for the Request

The emergence of the learning disability field represents one of the major recent developments in the field of special education to assist children who possess apparently normal levels of learning ability but who are not making commensurate academic progress. As a result of both federal and state legislation for program support at the local school levels, colleges and universities are, in turn, being obligated to prepare teachers with this type of specialization.

SLD

III. Staff.

The principal adviser for the program will be Dr. Vernon Simula.

IV. Effective Date.

Dependent upon formal review by the State Department of Education.

Formal Proposal to HECC Curriculum Advisory Committee

Title: Special Learning Disabilities (SLD) -- a program to be conducted by the Department of Special Education at UMD at the post-bachelor's, teacher-certification level and as a related field for the M.A. in Education degree

Date Submitted: October 28, 1970 Proposed Date of Implementation: June 15, 1971

Tentative Approval of the Institution's Governing Board

Need for the Program

Although teacher surpluses may have been acknowledged in certain fields, fully trained and certified teaching personnel in the field of learning disabilities has been identified as a critical shortage area. Public school administrators and parent groups continue to communicate this need to this department.

Firm Supporting Data to Establish this Need Data documenting this need has been published in three recent surveys: Minnesota State Department of Education, Professions Development Section, 1970; Educational Management Systems, 1970; and Research and Development Council for Northeastern Minnesota, 1969. A recently organized Duluth chapter of the Minnesota Association of Children with Learning Disabilities is vociferously calling for even higher levels of service than indicated by the three surveys cited.

Program Objectives

To prepare skilled teachers with an array of specialized instructional competencies to provide services to learning disabled children within an array of role settings.

Content of the Program

The program will feature selected theoretical components which will be coupled with continuous concurrent practicum for the development of competencies in the following process-type skills: 1) instructional decision making, 2) applied behavior analysis, 3) instructional systems analysis, 4) curriculum analysis, 5) organization of the learning environment, 6) management of the learning environment, and 7) the mobilization of resources.

Number and Type of Students to be Served Teachers pursuing this program may elect to enroll as adult special students to meet the teacher certification requirements or they may enroll as graduate students to meet both certification requirements and to apply credits taken in this area toward a related field requirement within the present M.A. in Education degree. It is anticipated that during the initial years, most students will be part-time students during the academic year and full time students during Summer Sessions. Present staff and facilities will permit an enrollment of about 10 full time academic year students with another 20-40 continuing as part time students during the year and in summers.

Number and Type of Students to be Served Five Years After the Inception of the Program

Although the need for teachers and course work is presently intense in this field, any projection of student numbers for a five year period would be predicated upon the availability of additional staff. To ensure a high quality program, enrollments would be limited to approximately present levels.

Relationship of the Proposed Program to Existing Programs at the Offering Institution

The program would have complementing functions with the Elementary Guidance Program, the Speech Pathology Program, the Elementary Teacher Education Program, the Child Development Program in Home Economics, the planned School of Social Work Program, and the planned Medical Sciences Program. Exploratory discussions have already been initiated with each of the above programs to develop possible interchange of staff, common program functions, and service courses.

Relationship of the Proposed Program to any Other Similar Programs Offered in the State in Both Public and Private Institutions

This proposal was concurrently submitted to the Minnesota State Department of Education where it was approved for teacher certification. As a consequence, it is now only one of the two learning disabilities programs with full training program approval status.

Additional Faculty Members Needed During the First Year of Operation

None (see Section 6.00 of proposal)

Additional Faculty Members Needed Five Years after its Inception

One

Equipment which will be Needed to Initiate the Program

Needed equipment (essentially instructional equipment and supplies) has been secured through an EPDA program development grant. This grant of \$65,000 included approximately \$3,000 for necessary initial equipment and supplies.

Equipment Needed During the Five-Year Period after its Inception

A major focus of the program is to develop more efficient and effective techniques for teacher education. The use of video-tape equipment will be a primary vehicle for accomplishing this. As a consequence, approximately \$5,000 worth of this type of equipment will be needed. A grant request for this has already been submitted.

The Indication of any Additional Laboratory Facilities Needed to Initiate the Program

These needs have been incorporated into the UMD Long Range Physical Facilities planning. Office, clinical and research space has been requested as part of the proposed Psychology-Speech Pathology-Special Education Building complex. Extensive use of public school buildings and facilities will be made in conjunction with the practicum phases of the program



Office of the Vice Provost  
for Academic Administration

November 10, 1970

TO: Stanley B. Kegler  
FROM: D. A. Vose *DAV*  
SUBJECT: Program Approval Request: Learning Disabilities

The attached request has been prepared by the Department of Special Education and endorsed by the Division of Education and Psychology and by this office.

It is transmitted for forwarding to the Higher Education Coordinating Commission through the office of the Vice President for Academic Administration.

DAV/mm

Office of the Chairman

November 6, 1970

TO: Vice Provost Vose  
Dean Lease

FROM: V. R. Plumb

SUBJECT: Program Approval Request: Learning Disabilities

The attached request has been prepared by Dr. Vernon Simula, Head of our Department of Special Education. It is framed in a manner which should be useful to the HECC.

I have gone over it in some detail, and recommend its transmittal to HECC through Vice President Shepherd's office.

VRP:jk

-VRP

cc: Vice President Shepherd  
Dr. Vernon Simula

October 28, 1970

A REQUEST FOR PROGRAM APPROVAL:  
SPECIAL LEARNING DISABILITIES (SLD)

(Post Bachelor's Teacher Certification Level  
and Related Field for M.A. in Education Program)

Department of Special Education  
University of Minnesota, Duluth

0.10 Preface

0.11 The documentation which follows is directed to the questions included in the guidelines issued on April 20, 1970 by means of a memorandum from Vice President Shepherd's office.

0.12 In the review of this request for program approval, it must be noted that considerable program development and implementation has already occurred prior to the issuance of the guidelines and the review procedures.

0.13 For example, a) curriculum proposals establishing certain of the courses in the program were initiated and approved on the UMD Campus as early as May 1968 with the remaining few courses and the program-as-a-whole being approved by the UMD Curriculum Committee in March 1970; b) the first-phase components of the program had been conducted through Summer Sessions in 1968 and 1969; c) allocation of one partial staff person for the program has been approved on March 21, 1969 by the faculty of the various departments within the UMD Division of Education and Psychology with the second full staff position being approved on December 1, 1969 by the department heads representing each of the Division departments and d) a request for EPDA funding of a 15 month phase of the program was transmitted on November 3, 1969 which was subsequently approved by the Minnesota State Department of Education for funding and training program approval.

0.14 Thus, the information to be supplied cannot be stated within the apparent intent of the guideline questions. This Department does, however, appreciate the necessity for this type of program monitoring.

0.20 Definition

0.21 By way of introduction the following three legal and professional definitions are offered to establish the basic context within which this program approval request is being presented.

0.22 "The Special Learning and Behavior Problems program of special education is authorized by Section 120.03, subdivision 3 of Minnesota's 1957 mandatory special education law. This section defines as handicapped, and thereby eligible for special education services, "every child who by reason of an emotional disturbance or a special behavior problem needs special education services but who is educable as determined by standards of the state board." (1)

0.23 "Learning disabled: Definition of the U.S.O.E., Bureau of Education for the Handicapped, 1969 and Public Law 91-230, dated April 13, 1970. Learning disabled children who "exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunctions, dyslexia, primarily to visual, hearing or motor handicaps, to mental retardation, emotional disturbances or to environmental disadvantage." (2)

0.24 Minnesota Title VI S.L.D. Task Force definition of the S.L.B.P. area; "Special learning disabilities are those educational problems which are not effectively reduced by ordinary and generally available educational techniques and facilities. They may be related to perceptual, intellectual, attitudinal, developmental, motivational and social factors which adversely affect the child's educational attainment." (3)

1.00 Need for the Program

1.01 The need for the establishment of a program to prepare teachers for the learning disabilities field is manifested primarily by the ever-growing demands being made by both parents and public school officials that more services must be provided for these children.

1.02 The magnitude of that need can be ascertained from several pupil incidence/staff utilization studies which have recently been completed.

1.03 The EMS Title VI ESEA Study (4) of April 1970 reported that "approximately 12 percent of the school children in Northeast Minnesota were identified as possessing handicaps of major educational significance" and that "approximately one-half of these children exhibited special learning disabilities." (4:70)

1.04 The EMS study also utilized and evaluated two separate procedures which used samples of student achievement and intelligence data for making further refinements of these estimates. The findings which were reported suggested that from approximately 4-6% of the 87,483 student population in northeast Minnesota were cases of special learning disabilities. Utilizing even the smaller of the two percentage figures, the estimated number of students involved within the total population would be approximately 3,500. The EMS study also provided projections of service needs for the 1974-75 and 1978-80 periods.

1.05 Another study based upon 1967-68 student enrollments covered a slightly larger geographical area of northeast Minnesota (encompassing 96,101 students) reported that only 335 students were actually being served by SLD programs during that year. The study estimated that an additional 4,470 students were in need of such services. The study also reported, that during the 1967-68 school year, 17 full time and 59 part time SLD teachers were employed. This figure was contrasted with the estimated 295 personnel that would be needed to meet the defined needs.

1.06 More recently, a survey of the Minnesota superintendents conducted by the State Department of Education and reported during June, 1970 revealed that related programs in a) learning disabilities, b) remedial reading, and c) areas other than requiring reading remediation were among the top 10 areas of critical teacher personnel needs, notwithstanding the present accounts of an oversupply of classroom teachers in other areas.

1.07 To compound the shortage of trained SLD teachers, there existed, as of July 1970, only two training programs among Minnesota institutions of

higher learning which were fully approved by the Minnesota State Department of Education. Programs at the other campuses were at varying stages of development.

## 2.00 Program Objectives

2.01 The principal objective of this program is to prepare skilled teachers who possess the following competencies as outlined by the Minnesota SLD Program Guidelines (1:18):

- 2.02
1. Ability to carry out suitable procedures for assessment of the precise nature of the child's reading, spelling, writing, arithmetic, or other skill learning difficulties,
  2. Ability to specify, in behavioral terms, instructional objectives which are appropriate to the skill needs and entry level characteristics of the individual case,
  3. Ability to estimate which systems of instruction, or learning conditions, are likely to be most effective for ameliorating the learning dysfunctions presented by the particular case,
  4. Ability to set up and maintain conditions and procedures of instruction suitable to the learning goals set for the individual case,
  5. Ability to assess instructional outcomes in terms of pupil behavior change and use this data in formulation of an on-going instructional plan adjusted to changed child conditions,
  6. Ability to use appropriate behavior management techniques with the child to help him develop the self-management skills required for constructive social participation and independent learning,
  7. Ability to explain to others working with the child the goals and essential characteristics of the teaching approach used with the individual case, so all persons working with the child can articulate their efforts effectively with the teaching effort,
  8. Appreciation of the limits of his or her competence to undertake certain kinds of diagnosis and treatment."

## 3.00 Content of Program

3.01 An explanation of the program specifics may be found in the curriculum request which has now been approved by the UND Curriculum Committee and the Minnesota Educational Group Committee and the Executive Committee of the Graduate School.

3.02 The following outline provides a synopsis of recommended foundations studies and clinical skills which will guide a teacher candidate and the adviser in planning a 33 credit program:

1. Foundation Studies (12 quarter credits)

a. Related Areas

- 1) Required: SpEd 5-251 Language Disorders in Children
- 2) Required: PsyF 5-611 Psychology of Human Learning
- 3) Elective: PsyF 5-311 Advanced Child Psychology
- 4) Elective: PsyF 5-111 Personality & Mental Hygiene
- 5) Optional: Educ 5-305 Measurement in the Classroom

b. Professional Areas

- 1) Required: SpEd 5-378 Education of L.D. Children
- 2) Optional: SpEd 5-220 Education of Exceptional Children
- 3) Optional: SpEd 5-150 Educ of Emo Dist & Soc Maladj or equiv.
- 4) Optional: Educ 5-375 Educ of Culturally Disadvantaged

2. Clinical Skills (21 quarter credits)

a. Prerequisite Phase

- 1) Required: Educ 5-370 Reading Disabilities
- 2) Required: EEd 5-356 Practicum: Reading Diagnosis
- 3) Required: Educ 5-673 Practicum: Reading Remediation
- 4) Optional: SpEd 5-371 Clinical Procedures with Children

b. Major Phase

- 1) Required: SpEd 5-374 Learning Disabilities I
- 2) Required: SpEd 5-675 Practicum: Learning Disabilities I
- 3) Required: SpEd 5-376 Learning Disabilities II
- 4) Required: SpEd 5-677 Practicum: Learning Disabilities II

4.00 Number and Type of Students

4.01 The type of students involved will be largely adult special students pursuing a post-bachelor's certification in this field. A smaller number (perhaps 20%) of the total number admitted would foreseeably pursue an M.A. Degree in Education.

4.02 As previously noted, the preliminary phases of the program were initiated as early as 1968 with all of the course work being provided either through Summer Sessions or the Evening Classes Section of the Extension Division. With the students who have undertaken the program by means of the above avenues coupled with the twenty students who were admitted to the program by means of the present EPDA project, a total of 37 part time students are presently in the program.

4.03 Although the need for teachers and course work is intense in this field, any projection of student numbers for a five year period would be predicated upon the availability of additional staff. Using the recommended student-staff ratio of 10 to 1 for first level graduate programs, it is felt that program enrollments will need to be limited to the present level.

5.00 Relationships to Existing Programs

5.01 As previously noted, this program is only one of the two within the state that has received full training program approval from the State Department of Education.

5.02 This program does have a complementary relationship to other existing programs on this campus: namely, the Elementary Guidance Program in the Department of Psychology, the Speech Pathology Program in the Department of Speech Pathology and Audiology, and the Elementary Teacher Education Program in the Department of Elementary Education. The complementary relationships are demonstrated by the interchange of staff and service courses. (See Section 6.00)

6.00 Staff and Department Utilization

6.01 As indicated in Section 0.13 of the preface, the department already has two staff members whose major responsibilities are with the learning disabilities program. Several other persons from other departments and public schools have also assumed instructional and supervisory responsibilities in the program. These persons will be identified in Section 6.05.

6.02 The department now has adequate personnel to conduct the program at its present level.

6.03 An examination of the requests from the public schools of the region for more inservice training of their present teachers would provide clear substantiation of a request for an immediate addition of one staff member.

6.04 In order to meet the projected increases in personnel needs which would necessitate a sizeable expansion of the program, the department would need three additional staff members in learning disabilities alone by 1980. The need for this type of expansion is documented in the UMD Long Range Plan.

6.05 Curriculum Vitae for Faculty

Dr. Virginia Brown

Education:

- B.A. University of Missouri, Kansas City, (1958)  
Elementary Education, Social Sciences
- M.S. Ed. University of Kansas (1966) Special Education; Sociology
- Ed.D. University of Kansas (1968) Special Education: Curriculum
- (USOE) Ohio State University (1969) Institute in Evaluation
- (USOE) Tucson Advanced Leadership Institute in Learning Disabilities (1969)



Experience:

Indiana University - 1968-1970	Coordinator, Learning Disabilities Program Staff: EPDA Project (BEH)
George Peabody College for Teachers - 1967-1968	Emotionally Disturbed Program Remedial Reading Program
University of Kansas - Su 1967	Instructor, Special Education
University of Kansas - Su 1966	Instructor, NEPA Reading Institute
Kansas City Public Schools	Ford Foundation Experimental Teacher Education Programs
Kansas City Public Schools	Remedial Reading Teacher
Kansas City Public Schools	Urban Negro Area Primary Teacher- Inner City

Program Responsibilities: (Full time)

Major Advisor, program development, community liaison, instruction

6.06 Curriculum Vitae for Faculty:

Dr. Vernon Simula

Education:

B.S.	University of Minnesota, Duluth (1954)	Education, English
M.A.	University of Northern Iowa (1960)	Elementary School Administration: Curriculum
Ed.D.	Indiana University (1964)	Elementary Education: Reading; Psychology/Linguistics

Experience:

University of Minnesota, Duluth (1964- )	Departmental Administration Program Coordination & Development Instruction: Ed Psych, Reading Methods Consultant: Learning Disabilities Programs
Ball State University (Su 1965)	Instructor, Reading Disabilities
Indiana University (Su 1963, 1964)	Instructor, Learning and Reading Disabilities Clinical Practicum Programs
Indiana University (1962-1964)	Graduate Assistant Center for Child Study
Waverly (Iowa) Public Schools (1958-1962)	Elementary teacher and curriculum coordinator

Program Responsibilities: (Part time)

Administration, community liaison, instruction

6.07 Curriculum Vitae for Faculty (Part time)

Bettye Bakkum

Education:

B.S. St. Cloud State College (1961) Elementary Education  
M.A. University of Minnesota (1964) Educational Psychology,  
Child Development, Psychology (NIH Fellow)  
Completing specialist's program in Special Education Administration,  
University of Minnesota

Experience:

Virginia (Minn.) Public Schools	Director of Special Education Director of Reading Clinic Educational Diagnostician Teacher of Emotionally Disturbed Teacher & Consultant for Gifted Remedial Reading
Sauk Centre, Minnesota	Elementary Teacher, grades 1 & 2
Perham, Minnesota	

Program Responsibilities:

Instruction (Extension and Summer Session) and Supervision of  
Practicums

7.00 Equipment

7.01 Needed equipment (instructional equipment and supplies) is presently being secured through the funds of the EPDA program development grant. Approximately \$3,000 was granted for this purpose.

7.02 Within the first five year period, approximately \$5,000 worth of video-tape equipment will be needed. The request for this has already been submitted.

8.00 Additional Laboratory Facilities

8.01 The program during the first two years has utilized public school classrooms of the Duluth public schools for both lecture, demonstration, and practicum activities. It is hoped that this relationship between this department and the public schools can be further developed in order to provide the program with a major "clinical" base from which to proceed with program development.

8.02 The need for additional office, clinical, and research space for the department and the program specifically has been made a part of the 1971 UMD Legislative Building Request as part of the Psychology-Speech Pathology-Special Education space/function needs. This also illustrates the type of interdepartmental planning and work that is already occurring.

9.00 Library Holdings

9.01 During the 1969-70 year, a systematic search of the UMD library holdings was undertaken to determine the resources that were germane to the learning disabilities field. Evaluation of the data revealed that present holdings are minimal but adequate. The systematic search process also yielded a manner by which future acquisition can be monitored directly by the department so that a quality resource can be made available on this campus.

9.02 The UMD Library holdings are supplemented by three important means: a) the micro-film techniques which make the entire card catalog of the Minneapolis Campus Wilson Library directly accessible to students on this campus, b) the newly improved interlibrary exchange service which now utilizes a teletype request exchange system, and c) the access of the Instructional Materials Center operated by the Department of Special Education on the Minneapolis campus -- a facility which also provides abstract and information retrieval service for the available research in the field of learning disabilities.

10.00 Total Estimated Costs

10.01 The costs for the initial establishment of the program have already been secured by means of University support (as of December 1, 1969) and by means of EPDA Program Development funding (\$65,000 for the period March 1, 1969 - July, 1971.)

10.02 In that many of the present course offerings are still conducted by means of the Summer Session and Extension Division, it is difficult to provide a realistic picture of what the cost of the program would be for the academic year budget. The assignment of staff to this program during the present year is largely for program development. As a consequence, this program can be expected to change significantly in both purpose and scope during the next few years. The following estimates of costs are based upon the projections that have been made available on the basis of present program development efforts.

10.03 The program as it might be projected for two years from now would foreseeably involve 10 - 30 adult special or graduate students, a number of whom would only be part time, which would be served by both the regular and Extension Division programs as well as approximately 20 students being served during each Summer Session.

To accurately indicate the cost of the learning disabilities program to the departmental academic year budget is difficult in that the designated faculty would also contribute to other phases of the total teacher education program. A general estimate of requested program support on a yearly basis would be as follows:

1½ FTE Staff @ \$16,000/9 mo.	\$24,000
Miscellaneous Help (Graduate assistant, field supervision)	6,500
Supplies & Expenses	<u>2,650</u>
Total	\$33,150

Remaining costs for instruction would be secured through the existing Summer Session and Extension Division tuition procedures.

11.00 Suggested Sources for Additional Funds

11.01 The focus of the present program development efforts are upon securing additional outside funding to provide for fellowships and supplementary support for the program. Examples of such funding sources would include USOE Public Law 88-126; USOE Public Law 89-10; Title VI, ESEA; and EPDA Legislation

12.00 Evidence of Articulation with Other Departments

12.01 Interdepartmental articulation and cooperation for the past establishment and future development of this program has included both administrators and individual faculty members principally of the UMD Departments of Psychology, Elementary Education and Speech Pathology and Audiology. Moreover, the Department of Special Education of the Minneapolis campus has provided invaluable guidance, counsel, and encouragement.

13.00 Proposed Date of Implementation

13.01 As previously noted, all of the first generation components of this program have been engaged as of September 1970. Present program development efforts will result in a major re-designing of the basic structure of the entire program. This second generation program will hopefully be implemented during the 1971-72 academic year.

A P P E N D I X

Letter #1      From Dr. Patricia Goralski, Director  
                  Professions Development Section  
                  Indicating State Department Approval

Letter #2      From Dr. Stephen Lundin, Project Evaluator  
                  Educational Management Services, Inc.



STATE OF MINNESOTA  
DEPARTMENT OF EDUCATION  
CENTENNIAL OFFICE BUILDING  
ST. PAUL, MINN. 55101

May 29, 1970

Dr. Thomas W. Chamberlin  
Academic Dean  
University of Minnesota  
Duluth, Minnesota 55812

Dear Dr. Chamberlin:

We are pleased to approve your program for training teachers in the field of Special Learning Difficulties (SLD). It is our understanding that this program will be initiated during the summer of 1970, in cooperation with the city of Duluth as part of an EPDA B2 program.

It is our further understanding that UMD will commit itself to the effective continuation of this program. During the course of our conversation prior to approval of the program, we indicated our interest in a program which would continue in the future to make it possible for teachers to obtain effective training in the area of Special Learning Difficulties during the course of two or more summers. It has been brought to our attention that one of the things that deters teachers from developing skills in specialized areas is the lack of availability of programs during times of the year when they are able to participate. It is very often impossible for teachers to be in residence for an entire year. Therefore, we are hopeful that after this first "EPDA year" that UMD will continue to make this training available during summer sessions as well as during the regular academic year.

We hope that staffing and other problems will be solved so that your program can move forward smoothly. Our best wishes.

Sincerely yours,

Patricia J. Goraliski, Director  
Professions Development Section

PJG/bh

cc: Dr. V. Plumb  
Dr. V. Simula ✓  
R. Burland  
G. Droubie  
C. Elliott  
J. Groos



CONSULTANTS IN EDUCATION

**EDUCATIONAL MANAGEMENT SERVICES, INC.**

1403 SILVER LAKE ROAD • NEW BRIGHTON, MINNESOTA 55112 • PHONE: 612 636 0177

August 26, 1970

Dr. Vernon Simula  
Director of Special Education  
Department of Education  
University of Minnesota, Duluth Branch  
Duluth, Minnesota

Dear Vern:

It was my pleasure to be present at the wrap-up of the summer phase of the EPDA-B2 Project in Duluth as part of the evaluation activities that EMS is performing for you. Too often the results of such evaluation sessions go unnoticed until the time of the final report. I believe there are some findings that you might be interested in at this time. These and other findings will be documented in a progress report to be distributed at the time of your first in-service meeting in the fall.

You will recall that on August 20th, I distributed a questionnaire to the 20 trainees which they returned immediately, and on August 21st I interviewed each of the trainees and discussed certain aspects of their responses to that questionnaire. A very interesting phenomenon occurred at that time. Any one of the twenty questionnaires could be chosen at random, and the responses therein could stand as a very close approximation of the mean response of all trainees. That is, almost to the person, the trainees responded in a highly similar manner.

The trainees gave the staff the highest ranking possible in the areas of capability, friendliness, degree to which they were respected, and the effort they put into their work. All of the trainees ranked Dr. Simula and Mrs. Johnson as the key personnel in the program in terms of their contribution. In ranking the relative contributions of the six three-credit components of the summer program, the learning disabilities practicums ranked number one across the board. Generally, the responses to all questions were highly positive and I will not go into detail on each of those questions at this time for those responses will be documented at a later date. There are some areas, however, where the program might be improved.

Dr. Vernon Simula

August 26, 1970

Many of the trainees noted that they would have benefited from having a complete review of the textbook materials, more specifically Myclebust and Johnson, at the beginning of the session. One or two of the trainees were somewhat anxious about going into junior and senior high schools, for they felt that the summer session had not focused to a great enough degree on the specific needs of secondary students. A number of the trainees felt that they might benefit from an increased emphasis on mathematics and task analysis within a mathematics framework. As a slight contradiction, however, each of the trainees made some comment to the effect that they felt the summer session was filled to the brim, and that there would not have been any space available for other topics. One or two of them mentioned that perhaps the emphasis on the phonics and speech related activities might be diminished somewhat in order to provide more time for study of the previously mentioned topics.

You will recall, Vern, that I reviewed many of the trainee folders; I reviewed their final examination papers; I have read their final reports and I studied in detail the files they had constructed on the students they dealt with, detailing tests administered, behavioral objectives written, contingencies manipulated, graphs constructed to demonstrate the effect of manipulating those contingencies, the description of the educational program derived from the results of the assessments they made and their summative remarks for each child. It was my judgement in reviewing these files and information sources and in checking my perceptions by asking the trainees content questions at the time of the interview, that these trainees are perhaps as well trained as any group of trainees I have had the pleasure of interacting with. I would like to suggest that you and Denny LaRock take steps to initiate a summer training program, commencing in the summer of 1971 which would service the entire state, for I feel very strongly that you have a service to offer the state that is of high caliber and is certainly in an area where presently some great needs exist.

Again I thank you for making a highly profitable visit possible, and I look forward to the continued activities of the evaluation of the EPDA-B2 program in Duluth, Happy sailing.

Sincerely,



Stephen C. Lundin, Ph.D.  
Director of Research and Evaluation

SCL:jj

cc: Denny LaRock  
Pat Goralski  
Richard Pearson



This program in Special Learning Disabilities is to be initiated as soon as it receives formal approval.

*These certified  
proposals sub LL  
5/20/72*

JUN 24 1970

UNIVERSITY OF *Minnesota*

GRADUATE SCHOOL • DULUTH, MINNESOTA 55812

Office of the Assistant Dean

June 23, 1970

Dean Francis M. Boddy  
312 Johnston Hall  
University of Minnesota  
Minneapolis, Minnesota 55455

Dear Dean Boddy:

I have Mrs. McDonald's letter of June 17th indicating that the Special Learning Difficulties program must have the specific information required by the Minnesota Higher Education Coordinating Commission by June 24th to be considered for the July meeting. I have discussed it with Dr. Vernon Simula and he will not be able to get the information to you in time for that deadline.

Dr. Simula expects to work on the information as soon as he can but a summer institute has rather tied him down for the moment. He will, if possible, have the material to you in time for an August meeting of HECC, if there is such a meeting. Otherwise I would suppose it will have to lay over until the sequence of meetings can take care of the matter.

Sincerely,

*Harry*  
M. H. Lease, Jr.  
Assistant Dean

*FMB has my copy of proposal*

MHL/lr  
cc: Dr. Vernon Simula

June 17, 1970

Dean M. Harry Lease  
SH 206  
University of Minnesota  
Duluth, Minnesota 55812

Dear Harry:

Dean Boddy said that he had talked with you about the need to revise or expand the proposal for the Special Learning Difficulties program to include the specific information required by the Minnesota Higher Education Coordinating Commission. I expect you received copies of the April 8 memorandum concerning HECC, but I have attached a copy of the guidelines anyway.

If you wish to have the proposal go before HECC at its July meeting, the revised copy or supplementary statement should be back in the Graduate School by June 24. And it should be typewritten copy (not ditto) so that we can reproduce sufficient copies for HECC.

While the Board of Regents will not meet until September (HECC and the Regents meet the same day in July), it may be possible to get a contingent approval if HECC recommends approval of the proposal.

Will you contact the appropriate persons about this? I note that Professor Simula would be principal adviser, but I couldn't be sure whether he was responsible for the proposal itself.

Thank you.

Sincerely yours,

Shirley McDonald  
Prin Exec Secretary

SM:MS  
enc

May 26, 1970

Dean Thomas W. Chamberlin  
University of Minnesota  
Duluth, Minnesota 55812

Dear Dean Chamberlin:

Following the recommendation by the Education Group Committee, the Graduate School Executive Committee approved the Post-Bachelor's Level Certification Program in Special Learning Difficulties. This approval is given with the understanding that this is not a new major, but an emphasis available within the existing Master of Arts in Education and that all of the requirements of the regular M.A. will be met.

This action was taken at the May 21, 1970 Executive Committee meeting and is recorded in the official minutes of that meeting.

The proposal will be sent to the Minnesota Higher Education Coordinating Commission for its review and will then be sent back to be transmitted to the Board of Regents for final action.

Sincerely yours,

Shirley McDonald  
Prin Exec Secretary

sm:ms

cc: Dean Harry Lacey  
Prof. Ward Wells

*Office of the Academic Dean*

April 15, 1970

Dean Bryce Crawford, Jr.  
321 Johnston Hall  
University of Minnesota  
Minneapolis, Minnesota 55455

Dear Dean Crawford:

The Duluth Campus wishes to request approval of a Post-Bachelor's Level Certification Program in Special Learning Disabilities (SLD) as proposed by the Duluth Department of Special Education in the Division of Education and Psychology.

This certification program, after approval, will then be submitted to the State Department of Education for its approval.

BULLETIN description of the proposal is attached to Mrs. Jaycox's copy of this letter as Curriculum Committee proposal No. 276, which was approved by the Duluth Campus Curriculum Committee on February 24, 1970. Further details concerning the program are available from Professor Vernon L. Simula, head of our Department of Special Education.

Sincerely,



T. W. Chamberlin  
Academic Dean

TWC/mm

cc: Assistant Dean M. H. Lease, Jr.  
Professor W. M. Wells  
Mrs. Faith Jaycox

July 12, 1971

Don M. Harry Lease  
University of Minnesota  
Administration 401  
Duluth, Minnesota 55812

Dear Harry:

On July 9, 1971, the Board of Regents approved the proposal to extend the M.S. in Chemistry to include the Plan B program. This action will be reported, for the record, at the first fall meeting of the Executive Committee.

Will you please inform Professors Thompson and Nichol and any other interested parties that students may now have the option of the Plan B?

Sincerely yours,

Shirley McDonald  
Prin Exec Secretary

SM:ms

SM:1)  
Phys. Sc. G.C.?

GRADUATE SCHOOL

MAR 9 1971

OFFICE OF THE DEAN

March 2, 1971

Dean Francis H. Boddy  
Associate Dean of the Graduate School  
University of Minnesota  
Minneapolis, Minnesota 55455

Dear Dean Boddy:

At the suggestion of Dean Harry Lease, we are sending you at this time, 30 copies of the preliminary proposal for a Plan B Master of Science program as requested by N.R.C.C.

Enclosed please find 30 copies of the preliminary proposal and 30 copies of the summary sheet. This proposal has been approved by the USD Curriculum Committee.

Sincerely,

*F.B.M.*  
Francis B. Moore  
Professor and Head

FHM/at

cc: Dean H. M. Lease  
Acting Vice Provost for Academic Admin. Vose  
✓ Dean R. J. Crawford

Enclosures

Preliminary Proposal to HECC Curriculum Advisory Committee

Title: A Proposal for the Extension of the Existing M.S. (Plan A) Program  
in Chemistry, University of Minnesota, Duluth, to Include Plan B

Date Submitted: January 29, 1971

Estimated Date of Formal Proposal: April 1971

The Need for the New Program

From time to time inquiries have been received regarding the availability of a Plan B program in chemistry and recently two well-qualified students have expressed a strong preference for this type of program as being more in accord with their interests than Plan A.

The Objective of the New Program

To provide a program for individuals in occupations for which an advanced knowledge of chemistry is needed, but with the emphasis on providing a broad background in course work, rather than on carrying out original research as in Plan A.

A Preliminary Estimate of the Number of Students to be Involved

1 to 5 per year in the foreseeable future

The Number of Faculty Members Required during the First Year of the  
Program's Operation

The present faculty will be adequate since all the courses required are already in existence, and are being offered in connection with the present graduate program



SUMMARY SHEET

TITLE OF PROPOSAL A Proposal for the Extension of the Existing M.S. (Plan A) Program in Chemistry Univ. of Minn., Duluth, to Include Plan B

TENTATIVE APPROVAL OF THE INSTITUTION'S GOVERNING BOARD

SUBMITTING INSTITUTION  
University of Minnesota

NEED FOR THE PROGRAM Well-qualified students have expressed a strong preference for a program with emphasis on a broad background of course work.

TYPE OF INSTITUTION

FIRM SUPPORTING DATA TO ESTABLISH THIS NEED

Expressed interest of students referred to above.

INTER-INSTITUTIONAL PLANNING

None

PROGRAM OBJECTIVES To provide a program for individuals in occupations for which advanced knowledge of chemistry is needed, but with emphasis on advanced course work rather than specialization in a research area

SIMILAR EXISTING OR PROPOSED PROGRAMS IN THE STATE, BY LOCATION, PLANNING AREA AND TYPE OF INSTITUTION

University of Minnesota, Minneapolis campus

Winona State College, Winona

CONTENT OF THE PROGRAM 45 quarter credits in graduate courses in the major and related fields plus term papers (Univ. of Minn., Plan B)

NUMBER AND TYPE OF STUDENTS TO BE SERVED

1 to 5 graduate students

NUMBER AND TYPE OF STUDENTS TO BE SERVED FIVE YEARS AFTER THE INCEPTION OF THE PROGRAM

1 to 5 graduate students

RELATIONSHIP OF THE PROPOSED PROGRAM TO EXISTING PROGRAMS AT THE OFFERING INSTITUTION. M.S. degree programs in the sciences at the Duluth campus include Biology (Plan B), Botany (Plan A), Zoology (Plan A), Geology (Plan A and B), and Physics (Plan A). The Minneapolis Campus Chemistry Dept. offers Plans A and B.

RELATIONSHIP OF THE PROPOSED PROGRAM TO ANY OTHER SIMILAR PROGRAMS OFFERED IN THE STATE BOTH PUBLIC AND PRIVATE INSTITUTIONS Winona State College offers Plan B in Chemistry

ADDITIONAL FACULTY MEMBERS NEEDED DURING THE FIRST  
YEAR OF OPERATION

None

ADDITIONAL FACULTY MEMBERS NEEDED FIVE YEARS AFTER  
ITS INCEPTION

None

EQUIPMENT WHICH WILL BE NEEDED TO INITIATE THE  
PROGRAM

None

EQUIPMENT NEEDED DURING THE FIVE YEAR PERIOD AFTER  
ITS INCEPTION

None

THE INDICATION OF ANY ADDITIONAL LABORATORY FACILITIES  
NEEDED TO INITIATE THE PROGRAM

None

THE INDICATION OF ANY ADDITIONAL LABORATORY FACILITIES  
NEEDED DURING THE FIVE YEAR PERIOD AFTER ITS INCEPTION

None

A SPECIFIC INDICATION THAT EXISTING LIBRARY HOLDINGS AND  
THE CURRENT LEVEL OF SUPPORT WILL BE SUFFICIENT TO  
ESTABLISH AND MAINTAIN THE NEW PROGRAM OR AN ESTIMATE OF  
THE ADDITIONAL COST OF OBTAINING SUFFICIENT LIBRARY  
HOLDINGS TO INITIATE THE PROGRAM

Existing library holdings and the current level of  
support are sufficient to initiate and maintain the  
program

TOTAL ESTIMATED COSTS FOR ESTABLISHING THE PROGRAM  
INITIALLY

None

TOTAL ESTIMATED COSTS FOR ESTABLISHING THE PROGRAM  
INITIALLY AND ON A FIVE YEAR BASIS

None

SUGGESTED SOURCES FOR ANY ADDITIONAL FUNDS REQUIRED TO  
ESTABLISH THE NEW PROGRAM

Duluth

C.C. No.	<u>40</u>
Department Approval	<u>1-29-71</u>
Division Approval	<u>2-11-71</u>
C. C. Approval	<u>2-22-71</u>

Approved  
BDR  
2/9/71

TO: Curriculum Committee

FROM: Department of Chemistry

SUBJECT: Proposal to add Plan B to the M. S. Program in chemistry.

The Department of Chemistry requests approval to offer a Plan B M. S. Program in Chemistry in addition to the Plan A program which is currently offered.

Supporting items:

See accompanying application, and summary sheet and preliminary proposal for HECC Curriculum Advisory Committee.

SUMMARY SHEET

TITLE OF PROPOSAL A Proposal for the Extension  
of the Existing M.S. (Plan A) Program in Chemistry  
Univ. of Minn., Duluth, to Include Plan B

SUBMITTING INSTITUTION  
University of Minnesota

TYPE OF INSTITUTION

INTER-INSTITUTIONAL PLANNING

None

SIMILAR EXISTING OR PROPOSED PROGRAMS IN  
THE STATE, BY LOCATION, PLANNING AREA AND  
TYPE OF INSTITUTION

University of Minnesota, Minneapolis campus

Winona State College, Winona

TENTATIVE APPROVAL OF THE INSTITUTION'S GOVERNING BOARD

NEED FOR THE PROGRAM Well-qualified students have expressed  
a strong preference for a program with emphasis on a broad  
background of course work.

FIRM SUPPORTING DATA TO ESTABLISH THIS NEED

Expressed interest of students referred to above.

PROGRAM OBJECTIVES To provide a program for individuals  
in occupations for which advanced knowledge of chemistry is  
needed, but with emphasis on advanced course work rather  
than specialization in a research area

CONTENT OF THE PROGRAM 45 quarter credits in graduate  
courses in the major and related fields plus term papers  
(Univ. of Minn., Plan B)

NUMBER AND TYPE OF STUDENTS TO BE SERVED

1 to 5 graduate students

NUMBER AND TYPE OF STUDENTS TO BE SERVED FIVE YEARS AFTER  
THE INCEPTION OF THE PROGRAM

1 to 5 graduate students

RELATIONSHIP OF THE PROPOSED PROGRAM TO EXISTING PROGRAMS  
AT THE OFFERING INSTITUTION. M.S. degree programs in the  
sciences at the Duluth campus include Biology (Plan B),  
Botany (Plan A), Zoology (Plan A), Geology (Plan A and B), and  
Physics (Plan A). The Minneapolis Campus Chemistry Dept.  
offers Plans A and B.

RELATIONSHIP OF THE PROPOSED PROGRAM TO ANY OTHER SIMILAR  
PROGRAMS OFFERED IN THE STATE BOTH PUBLIC AND PRIVATE  
INSTITUTIONS Winona State College offers Plan B in Chemistry

ADDITIONAL FACULTY MEMBERS NEEDED DURING THE FIRST  
YEAR OF OPERATION

None

ADDITIONAL FACULTY MEMBERS NEEDED FIVE YEARS AFTER  
ITS INCEPTION

None

EQUIPMENT WHICH WILL BE NEEDED TO INITIATE THE  
PROGRAM

None

EQUIPMENT NEEDED DURING THE FIVE YEAR PERIOD AFTER  
ITS INCEPTION

None

THE INDICATION OF ANY ADDITIONAL LABORATORY FACILITIES  
NEEDED TO INITIATE THE PROGRAM

None

THE INDICATION OF ANY ADDITIONAL LABORATORY FACILITIES  
NEEDED DURING THE FIVE YEAR PERIOD AFTER ITS INCEPTION

None

A SPECIFIC INDICATION THAT EXISTING LIBRARY HOLDINGS AND  
THE CURRENT LEVEL OF SUPPORT WILL BE SUFFICIENT TO  
ESTABLISH AND MAINTAIN THE NEW PROGRAM OR AN ESTIMATE OF  
THE ADDITIONAL COST OF OBTAINING SUFFICIENT LIBRARY  
HOLDINGS TO INITIATE THE PROGRAM

Existing library holdings and the current level of  
support are sufficient to initiate and maintain the  
program

TOTAL ESTIMATED COSTS FOR ESTABLISHING THE PROGRAM  
INITIALLY

None

TOTAL ESTIMATED COSTS FOR ESTABLISHING THE PROGRAM  
INITIALLY AND ON A FIVE YEAR BASIS

None

SUGGESTED SOURCES FOR ANY ADDITIONAL FUNDS REQUIRED TO  
ESTABLISH THE NEW PROGRAM

Preliminary Proposal to HECC Curriculum Advisory Committee

Title: A Proposal for the Extension of the Existing M.S. (Plan A) Program  
in Chemistry, University of Minnesota, Duluth, to Include Plan B

Date Submitted: January 29, 1971

Estimated Date of Formal Proposal: April 1971

The Need for the New Program

From time to time inquiries have been received regarding the availability of a Plan B program in chemistry and recently two well-qualified students have expressed a strong preference for this type of program as being more in accord with their interests than Plan A.

The Objective of the New Program

To provide a program for individuals in occupations for which an advanced knowledge of chemistry is needed, but with the emphasis on providing a broad background in course work, rather than on carrying out original research as in Plan A.

A Preliminary Estimate of the Number of Students to be Involved

1 to 5 per year in the foreseeable future

The Number of Faculty Members Required during the First Year of the  
Program's Operation

The present faculty will be adequate since all the courses required are already in existence, and are being offered in connection with the present graduate program

January 29, 1971

A PROPOSAL FOR THE EXTENSION OF THE EXISTING M.S. (PLAN A) PROGRAM  
IN CHEMISTRY, UNIVERSITY OF MINNESOTA, DULUTH, TO INCLUDE PLAN B.

A. Background

The M.S. program in chemistry on the Duluth campus was first offered in 1964. In the original planning it was decided to offer only the Plan A option, with the offering of Plan B to be left for consideration at some future time after the Plan A program was well established.

Since 1964 the Plan A program has expanded considerably. Initially two faculty members were approved to direct thesis research in two areas (inorganic and physical). At present, eight faculty members (out of a total of twelve in the Department) are approved to direct research in five areas (analytical chemistry, biochemistry, inorganic chemistry, organic chemistry and physical chemistry). In the same period 34 students\* have been admitted to the M.S. program, and the number enrolled at a given time has increased from 1 (1964-65) to 15 (1970-71).

Recently, (Graduate School Executive Committee meeting, March 19, 1970) a thorough revision of the program was approved on the basis of our experience over the past several years. As the main result of the revision, the M.S. degree is now offered just in chemistry, instead of in one of several specialized areas of chemistry.

Since 1964 master's degree programs in the sciences have also been approved in the Departments of Biology (Biology (Plan B), Botany (Plan A), Zoology (Plan A)), Geology (Plans A and B), and Physics (Plan A). The

---

\*Of the 19 students not currently enrolled, 10 have received the M.S. degree (4 of whom are continuing with studies elsewhere for the Ph.D.), 4 left in mid-program because of the draft, 2 have finished their research and are working on their theses, 1 resigned because of ill health, and 2 were asked to leave because of unsatisfactory performance. Of the 15 students currently enrolled, 8 are new this year, 5 are in their second year, and 2 (one of whom has just passed her thesis oral), are in their third year and registered for thesis only. Ten students are half-time T.A.'s.

Department of Chemistry on the Minneapolis campus offers both Plan A and Plan B. Winona State College offers a Plan B degree in Chemistry.

From time to time inquiries have been received regarding the availability at UMD of a Plan B program in chemistry. Recently two well-qualified students have expressed a strong preference for this type of program as being definitely more in accord with their interests, i.e. for a program with emphasis on a broad background of course work, rather than original research in a specialized area. The Chemistry Department, therefore, has recently considered the matter and has voted to take steps to offer an M. S. (Plan B) program.

It is not anticipated that a large number of students will be involved. A rough estimate would be one to five per year in the next five years. Since the program involves only graduate courses already in existence and being taught, no additional faculty will be needed. The only additional faculty responsibilities will be in regard to advisement and reading of Plan B papers, and the conducting of the examination for the degree by the examining committee. With the relatively few students involved, the present staff should be able to discharge these duties. There will be no need for new equipment. Existing library holdings and current level of support are sufficient to initiate and maintain the program. Therefore there should be no additional cost to the Department, and no additional sources of funds will be needed.

B. Administration of the M.S. (Plan B) Program

Matters pertaining to the graduate program in chemistry are dealt with by the Graduate Studies Committee, which consists of the Department Chairman and those members of the Department who have been given approval to advise graduate students. The Chairman of the Committee is appointed for a three-year term by the Department Chairman after consultation with



committee members, and also serves as the Director of Graduate Studies for the Department. Among the responsibilities of the Committee are the following:

- (a) To evaluate graduate student applications, to suggest the name of the initial adviser, and to recommend to the Department Chairman whether or not a teaching assistantship should be offered. The Director of Graduate Studies will sign the appraisal forms.
- (b) To brief incoming students regarding such matters as the general nature of the program, student duties and privileges, and the level of academic performance expected.
- (c) To administer the proficiency examinations given to entering students, and to work out the students' programs on the basis of their performance thereon. (At the present time the proficiency examinations are identical to those given on the Minneapolis Campus, so that students passing them at UMD do not have to take additional proficiency examinations if they transfer.)
- (d) To review the progress of the students quarterly.
- (e) To recommend approval of student applications for candidacy and to recommend the name of Duluth faculty members to serve on the examining committee.
- (f) To initiate proposals or consider suggestions for adding or dropping graduate courses, or in other ways modifying the graduate program.
- (g) To appoint subcommittees to carry out specific tasks as the need arises.

C. Curriculum

- (1) Minimum Preparation for Entering Students:
  - a. Major in chemistry, including physical chemistry with calculus, and junior-senior level inorganic chemistry.

- b. One year of university physics, preferably taught using calculus.
- c. Mathematics through calculus.

(2) Major and Minor Course Programs

- a. The following is a list of graduate chemistry courses:

Chem 5-230	Quantitative Analysis	3 - 5 cr
Chem 5-231	Methods of Separation	3 cr
Chem 5-232	Solution Equilibria	3 cr
Chem 5-233	Spectrochemical Methods of Analysis	3 cr
Chem 5-235	Electrochemical Methods of Analysis	3 cr
Chem 5-237	Analytical Techniques Lab.	3 cr
Chem 5-330	Biochemistry	4 cr
Chem 5-331	Biochemistry	4 cr
Chem 5-335	Biochemical Techniques	1 - 3 cr
Chem 5-413	Inorganic Chemistry Lab.	Cr Ar
Chem 5-430	Advanced Inorganic Chemistry	3 cr
Chem 5-440	Theoretical Inorganic Chem	3 cr
Chem 5-441	Physical Methods in Inorganic Chemistry	3 cr
Chem 5-530	Structural Organic Chemistry	4 cr
Chem 5-531	Organic Reaction Mechanisms I	4 cr
Chem 5-532	Organic Synthesis I	4 cr
Chem 5-540	Organic Reaction Mechanisms II	3 cr
Chem 5-541	Organic Synthesis II	3 cr
Chem 5-630	Chemical Thermodynamics	3 cr
Chem 5-635	Introduction to Quantum theory	3 cr
Chem 5-636	Introduction to Molecular Structure	3 cr
Chem 5-641	Chemical Kinetics	3 cr
Chem 5-631	Statistical Thermodynamics	3 cr

Chem 5-642	Transport Processes in Solution	3 cr
Chem 8-250	Selected Topics in Analytical Chemistry	cr ar
Chem 8-350	Selected Topics in Biochemistry	cr ar
Chem 8-450	Selected Topics in Inorganic Chemistry	cr ar
Chem 8-550	Selected Topics in Organic Chemistry	cr ar
Chem 8-650	Selected Topics in Physical Chemistry	cr ar

(Note: Chem 8-199 Research in Chemistry and the Chem 8-260, 8-460, 8-560, 8-660 series of General Survey courses, which simply serve as a means of officially recording proficiency examination results, do not count as major or minor courses.)

b. Specific programs

The specific program in each case will be worked out to serve the best interests and individual preferences of the student. The following sample programs are two of many possible combinations which would be suitable for students entering with adequate preparation as indicated in (1) above. These programs represent extreme cases in the sense that, for Sample 1, the major courses are selected from a single area of chemistry, with courses from other areas of chemistry comprising the related fields, while for Sample 2, the major courses represent a broad spectrum of chemistry areas, with all the related courses being in fields other than chemistry. Sample 1 could be the program for a student in or intending to go into industrial or government work who is seeking to strengthen his background in chemistry, while Sample 2 could serve the needs of a student interested in high school

or junior college teaching, as well as certain industrial positions such as chemical marketing.

Sample Program 1

1. Major

Chem 5-530	Structural Organic Chemistry	4 cr
" 5-531	Organic Reaction Mechanisms I	4 cr
" 5-532	Organic Synthesis I	4 cr
" 5-540	Organic Reaction Mechanisms II	3 cr
" 5-541	Organic Synthesis II	3 cr
" 8-550	Selected Topics in Organic Chemistry	<u>3 cr</u>
		21 cr

2. Related Fields

Chem 5-230	Quantitative Analysis	3 cr
" 5-231	Methods of Separation	3 cr
" 5-430	Advanced Inorganic Chemistry	3 cr
" 5-440	Theoretical Inorganic Chemistry	3 cr
" 5-630	Chemical Thermodynamics	3 cr
" 5-635	Introduction to Quantum Theory	<u>3 cr</u>
		18 cr

3. Additional Chemistry courses to bring the total to at least 45 cr.

Sample Program 2

1. Major

Chem 5-230	Quantitative Analysis	3 cr
" 5-330	Biochemistry	4 cr
" 5-430	Advanced Inorganic Chemistry	3 cr
" 5-530	Structural Organic Chemistry	4 cr
" 5-532	Organic Synthesis I	4 cr
" 5-635	Introduction to Quantum Theory	<u>3 cr</u>
		21 cr

2. Related Fields

Biol. 5-243	Cell Metabolism	5 cr
Biol. 5-443	Plant Physiology	5 cr
Geol. 5-020	Environmental Geol. of Minn.	5 cr
Geol. 5-400	Introductory Geochemistry	<u>3 cr</u>
		18 cr

3. Additional appropriate courses to bring the total to at least 45 cr.

(Examples: Econ. 5-001 Consumer Economics, 3 cr.

Educ. 5-231 Programmed Instruction in the classroom 3 cr,

Geog. 5-305 Comparative Cultural Geography, 3 cr, as well as chemistry)

(3) Plan B papers

The following are to be designated as "starred" courses in connection with which Plan B papers may be prepared:

- |                  |                                |            |                   |
|------------------|--------------------------------|------------|-------------------|
| Chem 5-230       | Quantitative Analysis          | Chem 5-641 | Chemical Kinetics |
| Chem 5-330/5-331 | Biochemistry                   |            |                   |
| Chem 5-430       | Advanced Inorganic Chem.       |            |                   |
| Chem 5-531       | Organic Reaction Mechanisms I  |            |                   |
| Chem 5-532       | Organic Synthesis I            |            |                   |
| Chem 5-630       | Chemical Thermodynamics        |            |                   |
| Chem 5-635       | Introduction to Quantum Theory |            |                   |

Plus the selected topics courses in all 5 areas (Chem 8-250, Chem 8-350, Chem 8-450, Chem 8-550, and Chem 8-650).

D. Staff:	Current Appointment
Francis B. Moore, Professor and Head	A-2
Thomas J. Bydalek, Professor	B (temporary)
Ronald Caple, Associate Professor	A-3
Robert M. Carlson, Associate Professor	A-3
Edward J. Cowles, Professor	A-2
Anna Marie Duval, Professor	A-1
Francis J. Glick, Associate Professor	A-2
Donald K. Harriss, Associate Professor	A-3
Vincent R. Magnuson, Assistant Professor	A-3
James C. Nichol, Professor (Director of Graduate Study)	A-3
Wilmar L. Salo, Assistant Professor	A-3
Larry C. Thompson, Professor	A-3

DEPARTMENT OF AEROSPACE ENGINEERING AND MECHANICS  
107 AERONAUTICAL ENGINEERING BUILDING  
MINNEAPOLIS, MINNESOTA 55455

April 14, 1971

MEMORANDUM

TO: Bryce L. Crawford, Jr., Dean  
FROM: W. H. Warner *W H Warner*  
SUBJECT: M.S. (Plan B) in Chemistry, Duluth

The Physical Sciences Group Committee recommends approval of the extension of the M.S. program in Chemistry at the Duluth Campus to include the Plan B option, as outlined in the proposal sent to us by the Graduate School on 4 March 1971.

cc: Harry Lease, Assistant Dean  
Prof. R. Dodson  
Prof. L. Thompson

July 12, 1971

Professor Charles Fairhurst  
Dept. of Civil & Mineral Engineering  
113 Miller

Dear Professor Fairhurst:

On July 9, 1971, the Board of Regents approved  
the proposed Ph.D. with a major in Geoen지니어링.

This action will be reported, for the record,  
at the first fall meeting of the Graduate School  
Executive Committee.

You may wish to inform other interested persons  
that students may now be admitted for the Ph.D.  
program in this major field.

Sincerely yours,

Shirley McDonald  
Prin Exec Secretary

sm:ms



Geo Eng  
April 7/9/71

April 14, 1971

Dr. Lloyd H. Lofquist  
Assistant Vice President  
Academic Administration  
213 Merrill Hall

Dear Vice President Lofquist:

On January 29, 1971, I sent to your office 30 copies of a proposal for a Ph.D. with a major in Geo-Engineering for submission to the Minnesota Higher Education Coordinating Commission. Although these were sent as the preliminary notification, the proposal was prepared following the guidelines (and breakdown on the summary sheet) established by the MHEC.

The Physical Sciences Group Committee reviewed the proposal and recommended approval at the meeting of February 9, 1971. Following this recommendation, the Graduate School Executive Committee approved the establishment of the Ph.D. with a major in Geo-Engineering. The M.S. in Geo-Engineering has been in existence for several years.

Dean Boddy suggests that the proposal as submitted on January 29 might serve also as the final proposal to be reviewed by the Commission.

Thank you.

Sincerely yours,

Shirley McDonald  
Principal Executive Secretary

SM:MO

Proposed Ph.D. Program in Geo-Engineering

The following notes have been prepared following the guidelines given in the memo "Submission of New Graduate Program Proposals and the Guidelines of the Higher Education Co-ordinating Commission." This memo was addressed to Deans, Directors of Graduate Study, et al., from Bryce Crawford, and Francis M. Boddy, dated April 7, 1970.

Title of Proposal

Ph.D. PROGRAM IN GEO-ENGINEERING

Submitting Institution

University of Minnesota

Type of Institution

University of Minnesota

Governor's Planning Area

(to be filled in by HECC)

Inter-Institutional Planning

Not discussed with other institutions since no other engineering programs in Minnesota.

Similar existing or proposed programs in the state

None

Tentative approval of the institution's governing board

Need for the program

Solution of many current socio-technological problems such as pollution, high density population, traffic congestion, preservation of attractive landscapes, etc., will involve use of the sub-surface to a much more extensive and varied degree than in the past. The technical difficulties involved in underground storage of natural gas, creation of 'artificial' aquifers, underground disposal of radioactive waste, extraction of ocean resources, safe erection of high dams on rock foundations, earthquake prediction, and many similar problems all require a much more sophisticated understanding of the properties of geological materials and structures and their use in engineering activities. Research is critically needed.

The University of Minnesota has been engaged in geo-engineering research since the mid-1950's and has established an international reputation for this work. It has had an M.S. program in Geo-Engineering (previously listed as Geological Engineering) for many years.

To date Ph.D. students working on geo-engineering problems have been awarded their degrees within the "Mineral Resources Engineering" Ph.D. program. This was appropriate some years ago when much of the research was closely related to mining problems. The much broader scope of our current research is such that Mineral Resources Engineering can often be a completely inaccurate description of the student's qualification. Civil service agencies, for example, would classify such Ph.D. graduates as Mining Engineers whereas many, with backgrounds in Civil Engineering, Geology and Geophysics, Mechanics, or Mathematics, have no knowledge whatsoever of mining. Geo-Engineering is an accredited area of professional specialization in engineering and it seems only reasonable to allow this designation to be available to students with Ph.D. qualifications in it.

Firm supporting data to establish this need

1. The urgency of the problems in pollution, etc., mentioned above is apparent to everyone.
2. Bodies such as the United Nations and the U. S. National Academy of Sciences have appointed study panels and committees, and produced numerous reports stressing the importance of geo-engineering problems. The National Academy of Sciences Report on Rapid Excavation (needed for the development of rapid transit tunnel systems and other situations), for example, recommended expenditure of \$200 million minimum over the decade 1970-80 for research on Geo-Engineering problems. There is a Bill HRL9492 now in Committee recommending the establishment of Centers of Excellence at U.S. universities for Research Institutes associated with "Mineral Conservation Education". Geo-Engineering research would be a large fraction of the activity of such institutes.
3. Even in the present severely depressed times for Ph.D. positions and research funds, all of our recent Ph.D. graduates have had no difficulty in securing excellent positions. At least six of our most recent Ph.D. graduates have been recruited by U.S. universities and asked to develop graduate programs in Geo-Engineering. Current research support in Geo-Engineering is approximately \$250,000 annually and likely to expand, as suitable staff and students become available.

## Program Objectives

To develop personnel with

- (i) a mature understanding of the geological environment and the response of rock to engineering activities, and
- (ii) the capability of conducting research to improve this understanding.

## Content of the Program

The courses undertaken by students will vary considerably depending on the undergraduate background. The program of study will be decided in consultation between the student and his advisor.

Students will generally be expected to have obtained an undergraduate degree in engineering, applied mathematics, or the physical sciences, from an accredited university. Normal University of Minnesota Graduate School admission standards will be required.

Students will be required to pass a preliminary written and oral examination before being admitted to candidacy; and then to prepare and successfully defend a Ph.D. research thesis.

The following program is presented as an example:

- (a) Student with a Civil Engineering baccalaureate degree.

### Major and Supporting Program

Structural Geology	3 cr
Advanced Structural Geology	3 cr
Rock Mechanics	9 cr
Advanced Rock Mechanics	6 cr
Fluid Flow through Porous Media	5 cr
Rheology and Strength of Solids	3 cr
Theory of Elasticity	6 cr
Theory of Elastic Stability	3 cr
Continuum Mechanics	3 cr
Methods of Applied Mathematics	9 cr
or Numerical Analysis	9 cr
Geo-Engineering Seminar	6 cr

Thesis: Design of Tunnel Support Systems.

Note: If the student is lacking in course material pre-requisite to the above courses, make up will be prescribed in additional.

A student entering with a Geology or Geophysics degree, for example, may be advised to substitute courses in Soil Mechanics, and Structural Analysis for Geological courses.

-4-

Number and type of students to be served

(a) initially. There are currently 14 students enrolled for graduate studies in Geo-Engineering. It is anticipated that approximately one-third of these may be successful in proceeding to the Ph.D. degree.

(b) in five years. The number of graduate students is confidently expected to at least double within the next five years.

Students should ideally have an undergraduate degree in engineering and an interest in applied geology.

Relationship of the proposed program to existing programs at the University of Minnesota

As mentioned earlier, the proposed program in Geo-Engineering is in some respects similar to that in Mineral Resources Engineering although it also covers many problems of engineering unrelated to minerals and mineral resources.

Courses taken by the students will draw on departments such as Geology and Geophysics, Mechanics, Mathematics, Computer Sciences, and Civil Engineering. Some of the staff in Geology and Geophysics, and Civil Engineering are both competent and interested in Geo-Engineering, and will be invited to join the graduate facility in this field.

No currently existing program at the University of Minnesota can provide the required background for Ph.D. competence in Geo-Engineering.

No other institution of higher education in Minnesota is able to provide a Ph.D. program in Geo-Engineering.

Departments and Faculty Involved

(a) Currently

Civil and Mineral Engineering

T. P. Bligh	Ph.D. 1971	University of the Witwatersrand South Africa
N.G.W. Cook	Ph.D. 1964	University of the Witwatersrand South Africa
S. L. Crouch	Ph.D. 1970	University of Minnesota
C. Fairhurst	Ph.D. 1955	(director of graduate study) University of Sheffield, England
C. R. Nelson	Ph.D. 1968	Massachusetts Institute of Technology
H. O. Pfannkuch	Dr. Ing.	School of Earth Sciences Aachen Germany
A. M. Starfield	Ph.D. 1965	University of the Witwatersrand South Africa

It is hoped to add to the Graduate faculty in Geo-Engineering from the School of Earth Sciences and from Civil and Mineral Engineering in the coming years. The present group, however, is quite adequate to provide coverage of a broad range of research topics in Geo-Engineering.

Equipment needed for the program

- (a) initially. Current facilities are adequate to initiate the program.
- (b) in five years. As currently envisaged, additional facilities in five years time are likely to be needed for field instruments, instrument truck, etc.

Additional laboratory facilities

It is difficult to forecast at present, but it is probable that present facilities may need to be doubled, if growth is as anticipated.

Level of support to maintain program

Current library holdings are adequate to maintain the Geo-Engineering program. Current level of state support should be increased by approximately three academic and three civil service (one secretary, two laboratory technicians) positions over the next five years.

Total estimated costs for establishing the program

- (a) initially. The program can be established immediately with no added cost.
- (b) in five years. The program can be sustained indefinitely without added cost. To grow as expected the above-mentioned staff positions are considered necessary.

Suggested source of additional funds

Federal funds are available (competitively) for equipment and research purposes. As mentioned above, federal consideration is also being given to the establishment of Mineral Industry Research Institutes at various U.S. universities. A Ph.D. program in Geo-Engineering could logically form part of such an Institute.

C. Fairhurst.

C. Fairhurst  
January 17, 1971

July 12, 1971

Dean Isabel Harris  
School of Nursing  
1913 Powell Hall

Dear Dean Harris:

On July 9, 1971, the Board of Regents approved the proposed M.S. with a major in Nursing which will replace the Medical-Surgical and Psychiatric Nursing majors.

This action will be reported, for the record, at the first fall meeting of the Graduate School Executive Committee.

Students who were admitted to the Psychiatric and Medical-Surgical Nursing majors may, of course, continue in these majors. If any wish to move to the single major in Nursing, we can change the files if your office can supply us with the students' names.

Sincerely yours,

Shirley McDonald  
Prin Exec Secretary

SHM:am

UNIVERSITY OF *Minnesota*

*appl*  
*7/9/71*

*NURSING*

*SMD*

*for Ex*

DECEMBER 1970

OFFICE OF THE DEAN

DEPARTMENT OF PEDIATRICS  
BOX 296 MAYO MEMORIAL BUILDING • MINNEAPOLIS, MINNESOTA 55455

December 14, 1970

Dean Bryce Crawford  
Graduate School  
321 Johnston Hall  
Campus

Dear Dean Crawford:

The revised Master of Science program in Nursing was approved at the meeting of the Medical Sciences Graduate Group Committee on December 10, 1970. Concern was voiced by certain committee members that the increased flexibility of the program would fail to insure that some students were well grounded in certain fundamental areas such as physiology, but Prof. Redman felt that this would continue to be a part of the program of those individuals specializing in acute care nursing as opposed to those specializing in areas related to community nursing.

Sincerely yours,

*Lewis W. Wannamaker, M.D.*  
Lewis W. Wannamaker, M.D.  
Chairman, Medical Sciences  
Graduate Group Committee

LWW:ad  
cc: Prof. Redman



HEALTH SCIENCES CENTER  
MEDICAL SCHOOL



SUMMARY SHEET

in nursing faculties  
and training programs

Title: Change to Major in Nursing.

Submitted by University of Minnesota  
School of Nursing.

State supported Institution.

No comparable School in Minnesota.

No comparable program in State.

No additional faculty needed in first year.

Additional faculty in five years - 22  
(whether or not this change is made).

No additional equipment, laboratory  
facilities or library holdings are  
related to this change. While increased  
needs will exist, they will be unrelated  
to this change. No additional costs are  
involved.

Tentative approval of board.

Flexibility of program planning required to  
meet staffing needs of a wide variety of  
employing agencies.

Conservative estimates of faculty needs for next  
five years for new positions or replacements <sup>is</sup>  
for 350 qualified instructors. This does not  
include needs for leadership personnel for hospi-  
tals and other health agencies.

The program prepares teachers of nursing, nurse  
clinicians, nursing supervisors and nurse admin-  
istrators.

Program includes instruction in nursing, teaching,  
related fields and research.

The 41 students presently enrolled have completed  
accredited baccalaureate programs in nursing.

Five years hence it is presently anticipated that  
the 180 students will have comparable prior  
preparation.

This is one of the health science programs and  
we anticipate much more interdisciplinary instruction.

There are no similar programs in any institution  
in Minnesota.

## PROPOSAL OF CHANGE IN MAJOR IN NURSING

The University of Minnesota School of Nursing proposes that a major in Nursing be established in lieu of the present majors in Psychiatric Nursing and Medical-Surgical Nursing. The purpose of the proposed change is to provide greater flexibility in program planning for students. The additional flexibility is particularly needed by graduate students preparing to teach in undergraduate nursing programs.

The University of Minnesota School of Nursing is the only graduate program in Minnesota, and the only sizeable program in the upper midwest area at the present time. As a consequence, it is looked to to provide the majority of faculty and other leadership personnel in nursing for the 206 hospitals and 55 Schools of Nursing in Minnesota as well as for other existing or evolving health agencies.

The Master of Science program in Nursing is developed to provide opportunity for students to grow toward achievement of the following objectives:

1. Ability to practice nursing with a degree of expertness that goes beyond the expectations held of beginning professional practitioners.
2. Functional knowledge and beginning competence in one of the following fields of nursing: advanced clinical nursing, teaching or leadership.
3. Attitude of critical assessment of situations as a basis for formulation of judgments and decisions.
4. Ability to participate intelligently in research projects and to make discriminating use of research findings.
5. Commitment to a responsibility for health needs of society and beginning skill in discharging this professional obligation.
6. Increased understanding and ability to function interdependently as a professional person.
7. Assumption of responsibility and skill in utilization of resources for continuing growth.

Models of curriculum patterns are depicted in the appendix.

Admission requirements include completion of a baccalaureate degree in nursing in an accredited college or University with a B average in undergraduate studies and demonstrated proficiency in nursing.

No admission examinations are required at the present time although their use is being evaluated. Examinations in individual courses are the prerogative of the instructor(s). A final oral examination by a committee appointed by the Graduate School is required. The committee is usually made up of two nursing faculty members and one faculty member from another field who has been involved in the student's program.

Plans for increasing enrollment in the program are as follows:

	1970-71	71-72	72-73	73-74	74-75
1st yr. students	26	50	75	90	100
2nd yr. students	15	25	45	65	80
Total	41	75	120	155	180

This increased enrollment is essential to provide the faculty needed for expansion of undergraduate programs and must be achieved whether or not the change proposed in this document is effected. Dr. Howard Bergstrom estimates that needs of the State Junior College System for new faculty to staff existing and planned associate degree programs in the next five years to be:

1971-72	18 new faculty
1972-73	34 " "
1973-74	30 " "
1974-75	22 " "
1975-76	15 " "

In addition there are presently nine baccalaureate programs, 13 diploma programs, one private junior college program, and 28 practical nursing programs

needing some new faculty as replacements or for expansion annually. Based on past experience, a conservative estimate for the next five years would be that a total of 250 new nursing instructors will be needed. Without qualified teachers, the nursing programs in Minnesota cannot meet the health needs of the state for nursing personnel.

This change, as indicated, will enable greater flexibility in program planning, especially for those students preparing to teach in undergraduate nursing programs. Students may continue to elect the existing curriculum patterns; those with differing goals may elect programs of study more nearly suited to their goals. There are no other graduate programs in nursing in Minnesota, Western Wisconsin, North Dakota or South Dakota.

While students elect courses in a wide variety of related fields, the following School of Nursing staff members would be those most involved in this change:

Marilyne Backlund	Joann Hubbard
Benita Cowlishaw	Barbara Redman
Frances Dunning	Grace Sarosi
Mary Louise Freeberg	Joan Tuberty
Isabel Harris	Dorothy Mahlum

We are presently recruiting individuals to fill four additional budgeted positions. Five years hence a graduate faculty numbering 30 would be required to provide instruction for 180 students.

Since the proposed change will not materially affect enrollment or methods of instruction, no equipment, laboratory facilities or library holdings are seen as related to the proposed change. We anticipate changes in teaching strategies, development of research programs and more extensive use of learning resources but these are essentially unrelated to the change proposed at this time, and those needs will occur whether or not this change is made.

No additional cost is involved. Indeed, it is possible that some savings may be effected with this change and the potential for interdisciplinary teaching.

This change in the major was requested by the Graduate Curriculum Committee of the School of Nursing, endorsed by graduate students enrolled at the present time, and approved by School of Nursing faculty. No opposition has been evidenced.

Some students newly enrolled Fall 1970, have evidenced interest in the potential for greater program flexibility and hope to avail themselves of the opportunity to design a more flexible program.

APPENDIX  
SAMPLE CURRICULUM  
PATTERNS

Plan A Program for Individual whose goal is teaching Psychiatric Nursing in an Associate Degree Program.

		<u>Credits</u>
Nursing 8-200	Foundations of Psychiatric Nursing	3
Nursing 8-202	Seminar and Practicum: Psychiatric Nursing in Group Relationships	5
Nursing 8-203	Psychiatric Nursing in the Community	4
Nursing 8-060	Advanced Clinical Nursing	3
Nursing 8-062	Interdisciplinary Health Seminar	<u>3</u>
	Major	18
Minor in Nursing Education		9

Plan A Program for Individual preparing for general instruction in an Associate Degree Program.

		<u>Credits</u>
Nursing 8-200	Foundations of Psychiatric Nursing	3
Nursing 8-203	Psychiatric Nursing in the Community	4
Nursing 8-100	Medical-Surgical Nursing	6
Nursing 8-102	Medical-Surgical Nursing - Chronic Illness	<u>6</u>
	Major	19
Sociology 5-201	Social Psychology	3
Sociology 5-401	Social Organization	3
Anthropology 5-361	Personality and Culture	<u>3</u>
	Minor	9

Plan B Program for individual whose goal is teaching in an Associate Degree Program preparing for Episodic Nursing Care

	<u>Credits</u>
Nursing 8-201 Seminar and Practicum: Psychiatric Nursing	8
Nursing 8-202 Psychiatric Nursing in Group Relationships	5
Nursing 8-100 Medical Surgical Nursing - I	6
Nursing 8-101 Medical Surgical Nursing - II	6
Nursing 8-021 Research In Nursing	3
Statistics	3
Speech and Personality	3
Physiology	5
Related field	6
Related Field in Nursing Education	9
Plan B Paper	6
	<u>60</u>

Plan B Program for individual whose goal is teaching in an Associate Degree program preparing for Distributive Care

	<u>Credits</u>
Nursing 8-020 Foundations of Nursing	3
Nursing 8-021 Research in Nursing	3
Nursing 8-201 Psychiatric Nursing	8
Nursing 8-203 Psychiatric Nursing in the Community	4
Nursing 8-100 Medical-Surgical Nursing	6
Nursing 8-102 Medical-Surgical Nursing - Chronic Illness	6
Speech and Personality	3
Group Dynamics	3
Statistics	3
Related Field	6
Related Field in Nursing Education	9
Plan B Paper	6
	<u>60</u>



Plan B program for individual whose goal is to be a generalist nurse clinician with emphasis on medical-surgical episodic care.

		<u>Credits</u>
Nursing 8-201	Psychiatric Nursing I	8
Nursing 8-202	Psychiatric Nursing II	5
Nursing 8-100	Medical-Surgical Nursing I	6
Nursing 8-101	Medical-Surgical Nursing II	6
Nursing 8-102	Medical-Surgical Nursing III	6
Nursing 8-060	Advanced Clinical Nursing	3
Nursing 8-021	Research in Nursing	3
Statistics		3
Physiology		5
Related Field		6
Related Field in Clinical Leadership		6
Plan B Paper		6
		<u>63</u>

*Original*

PRELIMINARY NOTIFICATION OF PROPOSAL TO EFFECT A CHANGE IN THE MAJOR OF THE GRADUATE PROGRAM OFFERED BY THE UNIVERSITY OF MINNESOTA SCHOOL OF NURSING: THIS CHANGE WOULD INVOLVE THE ESTABLISHMENT OF A SINGLE MAJOR, NURSING. THE CURRENT MAJORS IN PSYCHIATRIC NURSING AND MEDICAL-SURGICAL NURSING WOULD BE DISCONTINUED.

1. Need for the Change.

The present majors in Medical-Surgical and Psychiatric Nursing do not permit the degree of flexibility in program planning that is desirable for some students. This is particularly true for students preparing to teach in Associate Degree and many Baccalaureate programs in nursing where it is essential that the teacher be able to provide instruction and supervision in more than one clinical program. Nursing faculty for Junior College programs is one of the critical nursing needs in Minnesota. The establishment of a major in nursing would allow students who wish to do so to pursue the curriculum patterns which presently exist, and in addition, provide opportunity for combined clinical programs for those students who need and prefer breadth in preparation.

2. Objectives.

This proposal involves no change in objectives for the program. The greater degree of flexibility is required in response to changing concepts and practices in the fields of nursing and nursing education. No changes in present faculty or course offerings are involved at this time.

3. Faculty and Students involved during the first year of the change.

This involves no change in numbers of faculty and students. There are presently six faculty members and four positions that have not been filled at this time. We anticipate that 15 second-year students and 30 first-year students will be enrolled during the coming year. The proposed change would make additional options in program planning available to students entering this program, Fall 1970, and subsequent to this date.

PRELIMINARY NOTIFICATION OF PROPOSAL TO EFFECT A CHANGE IN THE MAJOR OF THE GRADUATE PROGRAM OFFERED BY THE UNIVERSITY OF MINNESOTA SCHOOL OF NURSING: THIS CHANGE WOULD INVOLVE THE ESTABLISHMENT OF A SINGLE MAJOR IN NURSING FOR THE MASTER'S DEGREE. THE CURRENT MAJORS IN PSYCHIATRIC NURSING AND MEDICAL-SURGICAL NURSING FOR THE MASTER'S DEGREE WOULD BE DISCONTINUED. THE PH.D. DEGREE IS NOT OFFERED IN THESE MAJOR FIELDS

1. Need for the Change.

The present majors in Medical-Surgical and Psychiatric Nursing do not permit the degree of flexibility in program planning that is desirable for some students. This is particularly true for students preparing to teach in Associate Degree and many Baccalaureate programs in nursing where it is essential that the teacher be able to provide instruction and supervision in more than one clinical program. Nursing faculty for Junior College programs is one of the critical nursing needs in Minnesota. The establishment of a major in nursing would allow students who wish to do so to pursue the curriculum patterns which presently exist, and in addition, provide opportunity for combined clinical programs for those students who need and prefer breadth in preparation.

2. Objectives.

This proposal involves no change in objectives for the program. The greater degree of flexibility is required in response to changing concepts and practices in the fields of nursing and nursing education. No changes in present faculty or course offerings are involved at this time.

3. Faculty and students involved during the first year of the change.

This involves no change in numbers of faculty and students. There are presently six faculty members and four positions that have not been filled at this time. We anticipate that 15 second-year students and 30 first-year students will be enrolled during the coming year. The proposed change would make additional options in program planning available to students entering this program, fall 1970, and subsequent to this date.

August 2, 1971

Professor Peter Robinson  
Chairman, French & Italian  
200 Peirce Hall

Dear Professor Robinson:

The proposed Master's Degree with a double major in French and Italian was reviewed and recommended by the Language, Literature, and Arts Group Committee and approved by the Graduate School Executive Committee in February 1971. On the first of March, the complete proposal and summary sheet was forwarded to the Minnesota Higher Education Coordinating Commission for review and recommendation. While the Graduate School did not receive word about the HECC action, approval of the program by the Board of Regents was announced in the June 15, 1971 University of Minnesota Brief. Regents approval came in the meeting of June 12, 1971.

I have a notation to the effect that Professor Lock was notified of this approval.

The action will be reported, for the record, at the first meeting of the Executive Committee in the fall and will be included in the official minutes of that meeting.

Sincerely yours,

(Mrs.) Shirley McDonald  
Prin Exec Secretary

sm:ms

PROPOSAL FOR A DOUBLE MAJOR  
IN FRENCH AND ITALIAN AT THE MASTER'S LEVEL

The existing Plans A and B for a Master's Degree in Italian are of little utility to students obtaining that degree. Theoretically, such a degree should enable their holders to teach Italian in high schools and junior colleges. Practically, however, this does not occur, since very few such institutions in the country exist which offer instruction in Italian. In order to teach Italian one is obliged to have a Ph.D. in Italian. The situation is quite different for other Romance languages such as French and Spanish. Since instruction in these languages is offered in many American institutions, holders of a M.A. in French or Spanish have a possibility to find a teaching position in the field of their studies.

Since not all candidates for a M.A. in Italian can continue their studies for a Ph.D. in Italian, we must carefully consider the future of such candidates: a student who has spent four years to obtain a B.A. in Italian plus two more years for a M.A. in that language has a right, it would seem, to a teaching position somewhere in the country.

According to the Graduate School rules as stated in the Graduate Bulletin, Plan B is obtainable through a program carrying a minimum of 45 graduate credits of which at least 21 must be in the major field while not less than 18 must be in at least two related fields. The candidate is also required to write 3 starred papers involving 9 credits.

I propose the establishment of a Plan C for a double major in French and Italian. According to this plan, a student must total a minimum of 48 credits (24 in French and 24 in Italian, or 27 in French and 21 in Italian, or vice versa) and also write 3 starred papers involving 9 credits (6 in French and 3 in Italian, or vice versa): 57 credits in all. Such a plan conforms to the existing Graduate School requirements for a Master's degree with one modification: instruction in two fields related to the major is replaced by instruction in one related field, another major.

Plan C solves the problem facing the candidates for a M.A. in Italian by giving them the possibility to teach a combination of French and Italian. Possibilities for such a combination exist in fact in various institutions, and students with a double major in French and Italian have real chances to find a teaching position. Such a plan will also boost the Italian graduate program at this university: some candidates for a M.A. in French may be attracted by Plan C, thus adding to the number of Italian graduate students which continues to be low. Finally, since a double major at the Master's level presupposes a double major, or its equivalent, at the undergraduate level, Plan C would necessarily strengthen the Italian undergraduate program.

Prepared by Professor Arshi Pipa

Endorsed by the Department of French and Italian, December 1970

Approved \_\_\_\_\_ Chairman. January 28, 1971

February 26, 1971

Dr. Lloyd H. Lofquist  
Assistant Vice President  
Academic Administration  
113 Merrill Hall

Dear Vice President Lofquist:

Enclosed are 30 copies of a preliminary notification, the final proposal and summary sheet for a proposed Master of Arts with a double major in French and Italian (Plan B).

This proposal, reviewed and recommended by the Language, Literature, and Arts Group Committee and approved by the Executive Committee on February 18 is ready for review by the Minnesota Higher Education Coordinating Commission.

Thank you.

Sincerely yours,

(Mrs.) Shirley McDonald  
Prin. Exec. Secretary

snms  
enclosures

Professor Leck:

This copy is for your information. Following the HECC review and recommendation, final approval must come from the Board of Regents. You will be informed.

## SUMMARY SHEET

Title of Proposal: Double Major in French and Italian for the M.A.

Submitting Institution: Department of French and Italian

Type of Institution: University

Tentative approval of the institution's governing board: Approved by LLA Group Committee.

Need for the Program: The outlook for teachers of Italian on the secondary school and junior college level is not encouraging. A double major (Italian and French) would greatly increase the chances of graduate students in this area.

Firm supporting date to establish this need: The new program can be immediately established within the present graduate structure of the department of French and Italian and the Graduate School.

Program objectives: To provide a strong background in French and Italian for graduate students.

Content of the program: 48 quarter credits (at least 21 in French and 21 in Italian) Plus present Plan B requirements.

Number and type of students to be served: Not known. Probably a dozen or so each year.

Number and type of students to be served five years after the inception of the program: About 50

Relationship of the proposed program to existing programs at the offering institution: Closely resembles present Plan B M.A. with modifications as set out above.

Relationship of the proposed program to any other similar programs offered in the state in both public and private institutions: This proposal represents a new concept.

9. Additional faculty members needed during the first year of operation: None

10. Additional faculty members needed five years after its inception: None

11. Equipment which will be needed to initiate the program: None

Equipment needed during the five year period after its inception: None

The indication of any additional laboratory facilities needed during the five year period after its inception: None

Summary sheet - page 2

The indication of any additional laboratory facilities needed during the five year period after its inception: none.

A specific indication that existing library holdings and the current level of support will be sufficient to establish and maintain the new program or an estimate of the additional cost of obtaining sufficient library holdings to initiate the program: present library holdings adequate.

Total estimated costs for establishing the program initially: none.

Total estimated costs for establishing the program initially and on a five year basis: none.

Suggested sources for any additional funds required to establish the new program: none.

*Peter Shook*

Chairman,

Dept. of French and Italian,

Feb. 25 1971



FINAL GUIDELINES FOR DOUBLE MAJOR IN FRENCH AND ITALIAN UNDER PLAN B FOR THE M.A.

1. Need for the program and firm data to establish this need.

Students graduating with an M.A. in Italian are having difficulty finding jobs in secondary and junior college teaching. As a result we are having difficulty with graduate enrollment in Italian. A double M.A. in Italian and French would provide stronger preparation and greater possibilities for future teachers.

2. The program objectives.

To provide a strong training in Italian and French Language and Literature, with an emphasis on interdisciplinary aspects of the two fields.

3. The content of the program, including a model curriculum, with a sample major, minor, supporting program; this should also include admission requirements and a description of the examining system.

48 quarter credits (consisting of at least 21 credits in French and 21 credits in Italian). Students would probably choose 24 credits in each literature; the courses taken would be from among those currently offered. All other Plan B requirements would obtain, including starred papers. A reading knowledge of both languages would of course be required, thus the foreign language requirement would be fulfilled.

4. Number and type of students to be served initially and five years after the inception of the program.

From 5 - 10 graduate students per year.

5. Relationship of the proposed program to existing programs at the offering institution and any other similar programs offered in the state in both public and private institutions.

As far as we know, this is the first such program in the state.

6. A list of the departments and individual staff members who would be involved in the program; additional faculty members needed during the first year of operation and five years after its inception; for Graduate School purposes curriculum vitae should be submitted for faculty already identified.

The program would need no additional staff and would depend entirely on the present structure of the Department of French and Italian.

7. Equipment which will be needed to initiate the program and during the five year period after its inception.

None.

Final Guidelines  
page 2

8. An indication of any additional laboratory facilities needed to initiate the program and during the five year period after its inception.

None.

9. A specific indication that existing library holdings and the current level of support will be sufficient to establish and maintain the new program or an estimate of the additional cost of obtaining sufficient library holdings to initiate the program.

Library holdings are adequate.

10. Total estimated costs for establishing the program initially and on a five year basis.

None.

11. Suggested sources for any additional funds required to establish the new program;

N/A

12. Evidence of thorough discussion of the new program with all staff members who might have an interest, together with a measure of the extent of the acceptance and opposition.

The program has been unanimously passed by the faculty of the Department of French and Italian and approved by the LLA Group Committee (see enclosure).

13. The proposed date for the implementation of establishment of the program.

Fall 1971.



Peter W. Lock  
Chairman  
Department of French and Italian

February 25, 1971

PROPOSAL FOR A DOUBLE MAJOR

IN FRENCH AND ITALIAN AT THE MASTER'S LEVEL

At its February 11, 1971 meeting the LLA Graduate Group Committee discussed a proposal for a new M.A. Program in French and Italian. The primary points of the proposal were:

- 1) Internal (support of graduate studies in Italian) and external (designation of degree for secondary-school teachers) circumstances suggest that a DOUBLE MAJOR in French and Italian would constitute a needed and attractive M.A. Program.
- 2) This new Program would involve:
  - a) a total of 57 quarter credits: 48 more or less evenly distributed between French and Italian and 9 for three Star papers.
  - b) a new designation: "Plan C for a double major in French and Italian."
  - c) the substitution of one of these majors for the current requirement of a related field involving instruction in at least two areas.

The Group Committee instructed me to summarize its reactions to this proposal and to discuss possible modifications of it with Professor Peter Lock, Chairman of the French and Italian Department. I have done so, and the following are the results of our discussion:

- 1) The generating motives behind the proposal are appreciated and approved by the LLA Group Committee.
- 2) At the suggestion of the Group Committee and with the approval of Professor Lock, the details of the proposal are to be modified as follows:
  - a) a total of at least 48 quarter credits (consisting of at least 21 credits in each language) will be required. No credit will be given for Star Papers.
  - b) The Program will be entitled "Double Major in French and Italian," but it will be a Plan B Program.
  - c) One of these majors will substitute for the related fields requirement.
  - d) The three Plan B Star papers will be divided between the two languages, i.e. two in French, one in Italian or vice versa.
  - e) Students in this Program need not pass a reading exam in a third modern foreign language.

These modifications, discussed at the Group Committee Meeting, meet the substantive issues of the proposal. Professor Lock approves of the modifications. I request that the Executive Committee approve the M.A. Program with a Double Major in French and Italian.

*R. J. Schork*

R. J. Schork  
Chairman, LLA Group Committee

Preliminary Notification

DOUBLE MAJOR IN FRENCH AND ITALIAN UNDER PLAN B FOR THE M.A.

(1) Need for new Program: Students graduating with an M.A. in Italian are having difficulty finding jobs in secondary and junior college teaching. A double M.A. in Italian and French greatly increases students' chances of finding a job.

(2) Objectives: To prepare graduate students to teach French and Italian language and literature. To emphasize the relationships between Italian language, literature and culture. Students would take at least 48 quarter credits (consisting of at least 21 in French and at least 21 in Italian). Other Plan B requirements would obtain.

(3) Faculty and Students involved: No extra faculty required. Thus the present faculty (18 in number) in the department of French and Italian would be involved. From 5 - 10 students would probably be involved.

*P. A. Ketchum*

*Chairman,*

*Dept. of French & Italian,*

*Feb 25 1971.*

UNIVERSITY OF *Minnesota*

DEPARTMENT OF FRENCH AND ITALIAN  
200 FOLWELL HALL • MINNEAPOLIS, MINNESOTA 55455

January 28, 1971

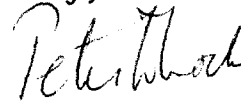
Dean Millard Gieske  
Graduate School  
327 Johnston Hall  
Minneapolis Campus

Dear Dean Gieske,

Following our phone call, I am forwarding for your consideration and that of the Group Committee a proposal for a double major in French and Italian at the M.A. level. The proposal was drafted by Professor Arshi Pipa, and has been unanimously accepted by the Department.

We would welcome your reactions to this proposal.

Sincerely,



Peter W. Lock  
Chairman

PL:jh

And by a. (LLA) 2/2/71

PROPOSAL FOR A DOUBLE MAJOR  
IN FRENCH AND ITALIAN AT THE MASTER'S LEVEL

The existing Plans A and B for a Master's Degree in Italian are of little utility to students obtaining that degree. Theoretically, such a degree should enable their holders to teach Italian in high schools and junior colleges. Practically, however, this does not occur, since very few such institutions in the country exist which offer instruction in Italian. In order to teach Italian one is obliged to have a Ph.D. in Italian. The situation is quite different for other Romance languages such as French and Spanish. Since instruction in these languages is offered in many American institutions, holders of a M.A. in French or Spanish have a possibility to find a teaching position in the field of their studies.

Since not all candidates for a M.A. in Italian can continue their studies for a Ph.D. in Italian, we must carefully consider the future of such candidates: a student who has spent four years to obtain a B.A. in Italian plus two more years for a M.A. in that language has a right, it would seem, to a teaching position somewhere in the country.

According to the Graduate School rules as stated in the Graduate Bulletin, Plan B is obtainable through a program carrying a minimum of 45 graduate credits of which at least 21 must be in the major field while not less than 18 must be in at least two related fields. The candidate is also required to write 3 starred papers involving 9 credits.

I propose the establishment of a Plan C for a double major in French and Italian. According to this plan, a student must total a minimum of 48 credits (24 in French and 24 in Italian, or 27 in French and 21 in Italian, or vice versa) and also write 3 starred papers involving 9 credits (6 in French and 3 in Italian, or vice versa): 57 credits in all. Such a plan conforms to the existing Graduate School requirements for a Master's degree with one modification: instruction in two fields related to the major is replaced by instruction in one related field, another major.

Plan C solves the problem facing the candidates for a M.A. in Italian by giving them the possibility to teach a combination of French and Italian. Possibilities for such a combination exist in fact in various institutions, and students with a double major in French and Italian have real chances to find a teaching position. Such a plan will also boost the Italian graduate program at this university: some candidates for a M.A. in French may be attracted by Plan C, thus adding to the number of Italian graduate students which continues to be low. Finally, since a double major at the Master's level presupposes a double major, or its equivalent, at the undergraduate level, Plan C would necessarily strengthen the Italian undergraduate program.

Prepared by Professor Arshi Pipa  
Endorsed by the Department of French and Italian, December 1970  
Approved Peter Lak Chairman. January 28, 1971

PROPOSAL FOR A DOUBLE MAJOR  
IN FRENCH AND ITALIAN AT THE MASTER'S LEVEL

At its February 11, 1971 meeting the LLA Graduate Group Committee discussed a proposal for a new M.A. Program in French and Italian. The primary points of the proposal were:

- 1) Internal (support of graduate studies in Italian) and external (designation of degree for secondary-school teachers) circumstances suggest that a DOUBLE MAJOR in French and Italian would constitute a needed and attractive M.A. Program.
- 2) This new Program would involve:
  - a) a total of 57 quarter credits: 48 more or less evenly distributed between French and Italian and 9 for three Star papers.
  - b) a new designation: "Plan C for a double major in French and Italian."
  - c) the substitution of one of these majors for the current requirement of a related field involving instruction in at least two areas.

The Group Committee instructed me to summarize its reactions to this proposal and to discuss possible modifications of it with Professor Peter Lock, Chairman of the French and Italian Department. I have done so, and the following are the results of our discussion:

- 1) The generating motives behind the proposal are appreciated and approved by the LLA Group Committee.
- 2) At the suggestion of the Group Committee and with the approval of Professor Lock, the details of the proposal are to be modified as follows:
  - a) a total of at least 48 quarter credits (consisting of at least 21 credits in each language) will be required. No credit will be given for Star Papers.
  - b) The Program will be entitled "Double Major in French and Italian," but it will be a Plan B Program.
  - c) One of these majors will substitute for the related fields requirement.
  - d) The three Plan B Star papers will be divided between the two languages, i.e. two in French, one in Italian or vice versa.
  - e) Students in this Program need not pass a reading exam in a third modern foreign language.

These modifications, discussed at the Group Committee Meeting, meet the substantive issues of the proposal. Professor Lock approves of the modifications. I request that the Executive Committee approve the M.A. Program with a Double Major in French and Italian.

*R. J. Schork*

R. J. Schork  
Chairman, LLA Group Committee

September 29, 1971

Professor Helen Showlund  
Physical Medicine & Rehabilitation  
273 ChMC  
East Bank

Dear Professor Showlund:

On the 27th of September, the Graduate School received word from Vice President W. G. Shepard that the Board of Regents approved the proposal that the M.S. in Physical Therapy be extended to include the Plan B program.

This action, which took place at the Regents meeting of September 10, 1971, will be reported to the Graduate School Executive Committee on October 12 and will be recorded in the official minutes of that meeting.

Sincerely yours,

(Mrs.) Shirley McDonald  
Prin Exec Secretary

SM:MS



June 22, 1971

Dr. Lloyd H. Lofquist  
Assistant Vice President  
Academic Administration  
213 Morrill Hall

Dear Vice President Lofquist:

Enclosed are 30 copies of a proposal and summary sheet for the extension of the M.S. with a major in Physical Therapy to include the Plan B.

This proposal was reviewed by the Medical Sciences Group Committee and recommended for approval on May 27, 1971. The Graduate School Executive Committee recommended that the proposal be accepted at the June 3, 1971 meeting.

We will appreciate your forwarding these materials to the Minnesota Higher Education Coordinating Commission for review.

Sincerely yours,

(Mrs.) Shirley McDonald  
Prin Exec Secretary

sm:ms  
enc - 30 proposals

SUMMARY SHEET

Title of Proposal  
Plan B Master's Program: Physical Therapy

Tentative approval of the institution's governing board

Submitting Institution  
University of Minnesota

Need for the program Established need for faculty and clinical instructors & supervisors to train physical therapists & physical therapy assistants. Severe shortage of both levels of workers.

Type of Institution  
University

Firm supporting data to establish this need Data attached from reports of U.S. Public Health Service & from Bureau of Health Manpower Education, National Institutes of Health.

Governor's Planning Area ← no need to answer

Program Objectives Prepare qualified physical therapists for positions as faculty & clinical instructors & supervisors for training of physical therapy & physical therapy assistant students.

Inter-Institutional Planning

Content of the program Major: Physical Therapy  
Related Fields: Education, Psychology, Public Health, Sociology, Business Administration, Industrial Relations.

Similar existing or proposed programs in the state, by location, planning area and type of institution

Number and type of students to be served Initially: 5 per year; qualified physical therapists

None

Number and type of students to be served five years after the inception of the program

5 to 15 per year

Relationship of the proposed program to existing programs at the offering institution

Existing Plan A master's program. Expansion of Graduate Study to include Plan B master's program.

Relationship of the proposed program to any other similar programs offered in the state in both public and private institutions

None offered elsewhere.

Additional faculty members needed during the first year of operation

None

Total estimated costs for establishing the program initially and on a five year basis None initially Estimated \$50,000 for expansion to 15 students.

Additional faculty members needed five years after its inception

Suggested sources for any additional funds required to establish the new program

At least 3 additional if enrollment increased to 15.

Allied Health Professions Training Grant, Department of Health, Education and Welfare. Grant Proposal has been submitted.

Equipment which will be needed to initiate the program

None

Equipment needed during the five year period after its inception

None anticipated

The indication of any additional laboratory facilities needed to initiate the program

None

The indication of any additional laboratory facilities needed during the five year period after its inception

Existing laboratory facilities adequate.

A specific indication that existing library holdings and the current level of support will be sufficient to establish and maintain the new program or an estimate of the additional cost of obtaining sufficient library holdings to initiate the program

Existing library holdings sufficient.

Total estimated costs for establishing the program initially

No additional costs anticipated

# PROPOSAL OF NEW GRADUATE PROGRAM

## PLAN B MASTER'S DEGREE PROGRAM

### MAJOR: PHYSICAL THERAPY

#### I. NEED FOR PROGRAM

The drastic shortage of physical therapists in the country has been reaffirmed by the most recent report from Division of Manpower Intelligence, Bureau of Health Manpower Education, National Institutes of Health. (See attached material from report). In 1969 1300 budgeted positions for physical therapists were unfilled and an additional need for 300 positions not in budget were indicated in this report. Unfilled positions for physical therapy assistants and aides numbered 400 with an additional 200 unbudgeted positions needed.

To adequately provide for the health care of the nation the projected needed increase in physical therapists by 1975 ranges from 116% to 332%. Increase in the supply of professional physical therapists is currently limited by the shortage in teaching faculty to staff the 53 educational programs leading to professional qualification. The severe shortage limits the enrollment of the present schools and diminishes the rate at which new schools can be developed. These university curricula not only need instructors in their academic programs but also require clinical instructors and supervisors to provide the important clinical phase of education.

Changes in the patterns of health care are creating changes in the responsibilities of physical therapists, with increased emphasis on expertise in evaluation, in supervision and in management of out-of-hospital care of long term rehabilitation patients. Experienced physical therapists have expressed need for updating and improving their skills in these areas. The advent of the technical physical therapy assistant three years ago has placed more emphasis on the supervision of the two levels of allied health personnel; the physical therapist and the physical therapy assistant.

St. Mary's Junior College, Minneapolis, was one of the first of the twenty such junior college programs now in operation nationwide. Providing academic faculty and clinical educators for the assistant students as well as professional students has been difficult due to the shortage of qualified physical therapists.

Professional needs and economic considerations point up the need for a twelve month master's degree program with the breadth of courses provided in a Plan B program to meet the needs of the physical therapy profession for teachers and clinical supervisors. The Plan B program, while including some research experience, would place major emphasis on preparation for teaching, supervision and administration. The present Plan A program will continue to provide opportunity for these master's students with interest in research and thesis.

## II. OBJECTIVES OF PROGRAM

To prepare qualified professional physical therapists for careers as:

1. Instructors in accredited curricula in physical therapy.
2. Instructors and administrators for junior college curricula training physical therapy assistants in two year programs.
3. Clinical instructors and supervisors for clinical teaching of both physical therapy students and physical therapy assistant students.

## III. RELATIONSHIP TO EXISTING GRADUATE PROGRAM:

The Department of Physical Medicine and Rehabilitation currently offers a Master's degree program (Plan A) which places emphasis on research and thesis equal to that of course work at the graduate level. The proposed Plan B program will provide more breadth of course work to meet the needs of the individual student while placing less emphasis on research. The inclusion of both Plan A and Plan B programs will provide more choice for prospective students. The University of Minnesota is one of eleven universities offering graduate programs for qualified physical therapists. It is the only one in Minnesota.

IV. FACULTY IN MAJOR FIELD: Present Graduate Faculty in Department of Physical Medicine and Rehabilitation.

## V. RELATED FIELDS:

Education (including Educational Administration, Educational Psychology, History and Philosophy of Education).

Psychology, Child Psychology, Public Health, Sociology,

Business Administration, Industrial Relations.

## VI. ADMISSION REQUIREMENTS:

1. Bachelor's degree with evidence of sufficient academic ability to indicate success in graduate study. (GPA of B or above in major subjects).
2. Completion of a physical therapy curriculum accredited by the Council on Medical Education in collaboration with American Physical Therapy Association.

VI. ADMISSION REQUIREMENTS: (CONT.)

3. Two letters of reference from professional persons qualified to comment on applicant's academic or professional capability.
4. Two years experience in the practice of physical therapy is recommended.

VII. REQUIREMENTS FOR MASTER OF SCIENCE DEGREE (PLAN B):

1. Minimum of 45 quarter credits in graduate courses with GPA of 2.80. Average of 3.0 required in major courses.
2. At least 21 credits in major field (physical therapy).
3. Not less than 18 of the 45 credits should be offered in at least two related fields with a minimum of 6 credits required in each. The related fields should be selected by the student in consultation with his major adviser with consideration of the student's background and goals in graduate study.
4. One or two plan B papers representing the quality but not the range of the master's thesis shall be prepared in independent study under faculty supervision and involve a total of nine credits. At least one of these should be in the major field.
5. Written examination in major field.
6. Oral examination by committee of three, two from the major field and one from a related field. The student will make available to the committee the Plan B papers prepared to fulfill the requirement of nine credits of independent work.
7. All requirements must be completed within seven years, including all graduate work transferred from University Extension or from other universities. Acceptance of transfer credits is subject to approval of the major department with a maximum of nine credits considered.

VIII. CONTENT OF PROGRAM

Physical therapists present great diversity in backgrounds since many entered the field of physical therapy after completing a baccalaureate degree in a related field, such as nursing, education or biological science. They also present diversity of clinical experience. The program for each student must be planned with consideration of the individual's background and his goals in graduate study.

Samples of three model programs follow.

IX. FACILITIES AND EQUIPMENT

No new facilities nor equipment will be required for initiation of this proposed Plan B master's program. Present facilities and equipment provided for the Plan A program will be utilized. The present clinical services and laboratories within the Department of Physical Medicine and Rehabilitation are adequate for the planned courses and clinical experience. Library holdings are sufficient.

X. FUNDING

This department has submitted a grant proposal to the Department of Health Education and Welfare for funding of additional faculty and supplies under the Allied Health Professional federal program. If this grant is received, expansion can proceed at a faster rate. If the grant is not received, the present faculty will maintain the program at the initial limited level of enrollment until such time as additional faculty positions are approved and funded.

For several years the University of Minnesota has been the recipient of an Allied Health Professions training grant providing funds for trainee support. These traineeships have not been utilized in full due to lack of applicants for the two year Plan A program.

XI. PROJECTED ENROLLMENT

No more than five fulltime students to be accepted during the first year.

Anticipated number within 5 years: 15

XII. PROPOSED DATE OF IMPLEMENTATION: Fall quarter, 1971.

MODEL CURRICULUM I.  
GOAL: UNIVERSITY INSTRUCTOR

MAJOR FIELD: PHYSICAL THERAPY

- 8-180/8-181 Physiological Bases for Therapeutic Exercise (6)  
P.Med. 8172/8-173 Educational Administration in Physical Therapy (6)  
P.Med. 8-130 Current Literature Seminar (2-3)  
P.Med. 8-170 Special Topics in Physical Therapy (2)  
P.Med. 8-185 Problems in Physical Therapy (3-5)  
P.Med. 8-192 Research Design (3)

RELATED FIELD: Educational Psychology

- PsyF 5-110 Introductory Statistical Methods (3)  
PsyF 5-120 Educational Measurement in the Classroom (3)  
PsyF 5-140 Introd. to Learning and Cognition  
HEd 5-182 Comparative Philosophies of Education (3)  
Educ 8-252 Effective College Teaching (3)

RELATED FIELD: PUBLIC HEALTH

- PH 5-002 Elements of Public Health (3)  
PH 5-790 Social and Economic Aspects of Medical Care (3)  
PH 5-518 Long Term Patient Care & Rehabilitation (1-3)  
PH 5-520 Field Practice: Physical Therapy in Community Agencies (ar)



MODEL CURRICULUM II.  
GOAL: JUNIOR COLLEGE TEACHING

MAJOR FIELD: PHYSICAL THERAPY

- 8-180/8-181            Physiological Bases for Therapeutic Exercise (6)  
P.Med. 8-172/8-173   Educational Administration in Physical Therapy (6)  
P.Med. 8-150            Current Literature Seminar (2-3)  
P.Med. 8-170            Special Topics in Physical Therapy (2)  
P.Med. 8-185            Problems in Physical Therapy (3-5)  
P.Med. 8-192            Research Design (3)

RELATED FIELD: EDUCATIONAL ADMINISTRATION

- EdAd 8-274            The Junior College (3)  
EdAd 8-275            Junior College Administration (3)  
Educ 8-252            Effective College Teaching (3)  
PsyF 5-110            Introductory Statistical Methods (3)  
CSPP 5-110            Counseling Procedures (3)

RELATED FIELD: PSYCHOLOGY

- Psy 5-001            Theories of Learning (3)  
Psy 5-201            Social Psychology (3)

Electives:

- PH 5-790            Social and Economic Aspects of Medical Care (3)

MODEL CURRICULUM III  
GOAL: CLINICAL SUPERVISOR

MAJOR: PHYSICAL THERAPY

- 8-103 Physical Therapy Clinic (3)
- 8-130 Current Literature Seminar (2-3)
- 8-171 Administration of Physical Therapy Services (3)
- 8-192 Research Design (3)
- 8-180/8-181 Physiological Bases for Therapeutic Exercise (6)
- 8-170 Special Topics in Physical Therapy (3)

RELATED FIELD: BUSINESS ADMINISTRATION

- Mgmt 8-001 Fundamentals of Management (3)
- Mgmt 8-007 Superior-Subordinate Problems (3)

RELATED FIELD: PUBLIC HEALTH

- PH 5-002 Elements of Pub. Health (2)
- PH 5-790 Social and Economic Aspects of Health Care (3)
- PH 5-507 Group Dynamics (2)
- PH 5-518 Long Term Patient Care & Rehabilitation (3)

ELECTIVES:

- Soc. 5-421 Occupational Sociology (3)
- IR 5-005 Interpersonal Perception: The Employment Interview (3)
- CPsy 5-319 Clinical Procedures with Children (3)

## Plan B Program in Physical Therapy

### Related Fields

#### EDUCATION

Educ 8-250	Higher Education in the United States (3 cr)
Educ 8-251	Curriculum Trends in American Colleges (3)
Educ 8-252	Effective College Teaching (3)
Educ 8-254	Directed Experience in College Instruction (cr arr)

#### EDUCATIONAL ADMINISTRATION

EdAd 8-201/8-202	Foundation of Educational Administration (3)
EdAd 8-253	Administration in Higher Education (3)
EdAd 8-274	The Junior College (3)
EdAd 8-275	Junior College Administrations (3)
EdAd 8-291	Public Relations for Colleges and Universities (3)

#### EDUCATIONAL PSYCHOLOGY

CSPP 5-110	Counseling Procedures (3)
CSPP 8-540	Seminar: The College Student (1-3 cr)
PsyF 5-110	Introductory Statistical Methods (3)
PsyF 5-510	Introductory Statistical Methods - Laboratory (2)
PsyF 5-120	Educational Measurement in the Classroom (3)
PsyF 5-122	Instruments and Techniques of Measurement (3)
PsyF 5-140	Introduction to Learning and Cognition (3)
PsyF 5-160	Personality Development and Mental Hygiene (3)
PsyF 5-170	Social Psychology of Education (3)
PsyF 5-174	Orientation and Mobility for Blind Children (3)
SpEd 8-120	Psychological Theory and Research in Mental Retardation (3)
SpEd 8-121	Functional Analysis of Behavior in Mental Retardation (3)

#### HISTORY AND PHILOSOPHY OF EDUCATION

Hed 5-101	Historical Foundations of Modern Education (3)
Hed 5-131	Comparative Education (3)
Hed 5-141	Critical Issues in Contemporary Education (3)
Hed 5-171	Anthropology and Education (3)
Hed 5-182	Comparative Philosophies of Education (3)

#### CHILD PSYCHOLOGY

CPSY 5-313	Psychology of Handicapped Children (3)
CPSY 5-319	Clinical Procedures with Children (3)
CPSY 5-341	Sensory and Motor Development (3)
CPSY 8-341	Perception in Children (3)

## PSYCHOLOGY

Psy 5-001	Theories of Learning (3)
Psy 5-012/5-013	Psychology of Learning (3/qt)
Psy 5-101/5-102	Personality (3/qt)
Psy 5-125/5-126	Differential Psychology (3/qt)
Psy 5-201	Social Psychology (3)
Psy 5-604/5-605	Abnormal Psychology (3/qt)
Psy 5-061	Physiological Psychology (3)
Psy 5-051	Perception
Psy 5-701	Personnel and Industrial Psychology
Psy 5-702	Psychology of Individual Behavior in Organizations (3)

## SOCIOLOGY

Soc. 5-201	Social Psychology (3)
Soc. 5-421	Occupational Sociology (3)
Soc. 5-855	Sociology of Medicine, Medical Institutions (3)

## PUBLIC HEALTH

P.H. 5-002/5-003/5-004	Elements of Public Health I, II, III (3 cr/qt)
P.H. 5-407	Vital Statistics (3 crs)
P.H. 5-507	Group Dynamics (2 crs)
P.H. 5-518/5-519	Long Term Patient Care and Rehabilitation (arr cr)
P.H. 5-520	Field Practice: Physical Therapy in Community Agencies (arr cr)
P.H. 5-790	Social and Economic Aspects of Medical Care (3 cr)
P.H. 5-700	Public Health Administration (3 cr)
P.H. 8-506	Health Behavior and Socio-cultural Change (3 cr)

## BUSINESS ADMINISTRATION

Mgmt 8-001	Fundamentals of Management (3)
Mgmt 8-006	Executive Leadership (3)
Mgmt 8-007	Superior-Subordinate Problems (3)
Mgmt 8-801	Seminar: Interpersonal Relations (3)
BLaw 8-158	Business Law: Contracts (3)

## INDUSTRIAL RELATIONS

IR 5-002	Industrial Relations Fundamentals (3)
IR 5-032	Systems of Industrial Relations: Manpower Management (3)
IR 5-003	Interpersonal Perception: the Employment Interview (3)

"HEALTH MANPOWER IN HOSPITALS." The Division of Manpower Intelligence, Bureau of Health Manpower Education (BHME), National Institutes of Health, has released its first report titled *Health Manpower in Hospitals* (Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; \$1 per copy). Authored by Garrie J. Losee and Marion E. Altenderfer, the 82-page report "...reflects progress in recruiting and training critically needed health manpower. It presents national and regional estimates of professional and technical health personnel employed in hospitals in the United States on March 28, 1969, and gives projected estimates of the additional full-time personnel needed to provide the best possible patient care." The report shows that the allied health occupations had 436,200 persons in hospitals, accounting for about 23% of the three million hospital employees. The most needed allied professionals for unfilled vacancies were physical and occupational therapists. The greatest employment increases for allied health workers from 1966 to 1969, were for cytotechnologist technicians (1,600 to 3,100), and electrocardiographic technicians (5,900 to 8,500). The 1969 survey was conducted by the BHME in collaboration with the American Hospital Association. Here is Table 1 from the report:

Table 1. *Number of persons employed and additional positions needed to provide optimum patient care in hospitals in the United States, by category of personnel: 1969*

Category of personnel	Present employment				Additional positions needed	
	Total	Full time <sup>1</sup>	Part time <sup>2</sup>	Equivalent full time <sup>3</sup>	Budgeted positions vacant	Positions not in budget
All categories.....	2,858,500	2,360,400	498,100	2,609,400	116,500	48,300
All professional and technical..	1,874,200	1,515,000	359,200	1,694,600	93,400	35,800
Physicians:						
Medical interns and residents..	55,000	52,500	2,500	53,800	4,100	1,100
Other physicians.....	58,200	39,700	18,500	48,900	2,700	2,100
Dental services:						
Dental interns and residents....	1,600	1,500	100	1,600	(4)	(4)
Other dentists.....	5,800	4,400	1,400	5,100	100	100
Dental hygienists, licensed.....	500	500	(4)	500	100	100
Dental assistants.....	5,300	5,200	100	5,300	400	300
Dental laboratory technicians..	1,400	1,400	(4)	1,400	100	(4)
Clinical laboratory services:						
Clinical laboratory scientists....	4,500	3,800	700	4,100	200	100
Clinical laboratory technologists.....	44,500	36,300	8,200	40,400	2,300	400
Cytotechnologists-technicians..	3,300	2,700	600	3,000	200	100
Histologic technicians and aides.....	5,600	4,900	700	5,200	200	100
Other clinical laboratory personnel.....	42,800	32,700	10,100	37,800	1,200	500
Dietary services:						
Dietitians.....	12,700	9,400	3,300	11,000	700	200
Dietary technicians.....	18,100	16,300	1,800	17,200	400	100
Medical record services:						
Medical record librarians.....	6,400	5,400	1,000	5,900	400	100
Medical record technicians.....	6,900	6,200	700	6,600	300	200
Medical record clerks.....	33,300	28,000	5,300	30,600	1,100	400
Nursing services:						
Registered nurses.....	461,000	319,400	141,600	390,200	32,300	7,100
Practical or vocational nurses, licensed.....	205,000	171,400	33,600	188,200	15,300	3,900
Nursing aides, orderlies, and attendants.....	568,500	489,200	79,300	528,800	16,800	9,200
Ward clerks.....	58,000	49,100	8,900	53,600	2,500	2,100

(more)

Table 1.—Continued

Category of personnel	Present employment			Additional positions needed		
	Total	Full time <sup>1</sup>	Part time <sup>2</sup>	Equivalent full time <sup>3</sup>	Budgeted positions vacant	Positions not in budget
<b>Pharmacy:</b>						
Pharmacists, licensed.....	13,600	9,800	3,800	11,700	600	200
Pharmacy assistants and aides..	9,900	7,300	2,600	8,600	300	200
<b>Radiologic technology:</b>						
X-ray technologists-technicians.....	31,100	26,500	4,600	28,800	1,300	500
Nuclear medical and radiation therapy technologists-technicians.....	3,100	2,800	300	2,900	200	100
Radiologic assistants.....	9,000	7,300	1,700	8,100	100	100
<b>Therapeutic services:</b>						
Occupational therapists.....	5,400	4,700	700	5,100	600	300
Occupational therapy assistants and aides.....	5,100	4,800	300	5,000	200	200
Physical therapists.....	8,600	6,600	2,000	7,600	1,300	300
Physical therapy assistants and aides.....	8,700	7,100	1,600	7,900	400	200
Speech pathologists and audiologists.....	1,800	1,100	700	1,400	100	100
Recreation therapists and aides..	5,500	4,700	800	5,100	300	200
Inhalation therapists and aides.....	14,600	12,800	1,800	13,700	900	500
Social workers.....	15,200	13,900	1,300	14,600	1,200	1,100
Social work assistants and aides.....	4,300	4,100	200	4,200	200	300
<b>Other professional and technical:</b>						
Hospital administrators and assistants.....	17,200	16,800	400	17,000	500	100
Medical secretaries.....	23,900	21,600	2,300	22,800	800	500
Surgical aides.....	23,400	21,400	2,000	22,400	900	300
Obstetric, pediatric, and other physicians' aides.....	10,900	10,000	900	10,500	300	200
Electrocardiographic technicians.....	9,100	7,500	1,600	8,300	200	100
Electroencephalograph and other medical machine technicians.....	3,100	2,600	500	2,800	100	100
Ambulance drivers and attendants.....	5,600	4,400	1,200	5,000	100	300
Personnel in other health occupations.....	21,800	18,800	3,000	20,300	700	1,200
Trainees not otherwise reported.....	24,800	18,500	6,300	21,700	900	100
<b>All other hospital personnel.....</b>	<b>984,300</b>	<b>845,400</b>	<b>138,900</b>	<b>914,800</b>	<b>23,100</b>	<b>12,500</b>
Food service.....	243,800	192,700	51,100	218,300	4,900	1,700
Laundry.....	59,000	54,000	5,000	56,500	1,000	500
Housekeeping.....	179,500	160,700	18,800	170,100	4,100	2,700
Maintenance.....	102,500	96,000	6,500	99,200	2,700	900
Business management.....	62,900	56,300	6,600	59,600	1,200	400
Clerical, secretarial, and related services.....	191,600	163,100	28,500	177,400	4,600	1,400
Other hospital personnel.....	145,000	122,600	22,400	133,800	4,300	5,000

NOTE.—Column figures may not add to totals and subtotals due to rounding.

<sup>1</sup> Employed 35 hours or more per week.<sup>2</sup> Employed less than 35 hours per week.<sup>3</sup> Equivalent full-time employment was calculated on the basis that 2 part-time persons equal 1 full-time person.<sup>4</sup> Less than 50.

Medical Allied Health Manpower Requirements and  
Supply: 1967, 1975, and 1980

OCCUPATIONAL CATEGORY	ITEM	1967	1975	1980
<b>TOTAL ALLIED HEALTH</b>				
MANPOWER.....	Requirements	1,034,200	1,466,000	1,776,000
	Supply	806,500	1,144,000	1,372,000
	Deficit	227,700	322,000	404,000
<b>AT LEAST BACCALAUREATE:</b>				
Medical.....	Requirements	225,000	348,000	413,000
	Supply	175,000	270,000	320,000
	Deficit	50,000	78,000	93,000
<b>LESS THAN BACCALAUREATE:</b>				
Medical.....	Requirements	336,500	488,000	580,000
	Supply	276,500	400,000	475,000
	Deficit	60,000	88,000	105,000

Source: Public Health Service estimates.

Notes: Figures in this table do not include licensed practical nurses, nurses aides, orderlies, or attendants.

## National Estimates of Manpower Requirements

Recent sources of national estimates of health manpower requirements are: (1) assembled professional judgments, (2) a computation of the manpower required to provide in each of the four Census regions of the United States the manpower available in the region with the highest rate of utilization, (3) manpower projections by the Bureau of Labor Statistics,<sup>1</sup> and (4) needs for additional manpower as reported in a 1966 survey of hospitals. These estimates are summarized in table E-1.

The first two sources forecast 1975 additional requirements of 34 percent and 36 percent in excess of the 1966 number of workers in all health occupations. In view of the recent high rate of growth of the economy and of increasing investment in health care, these forecasts seem to be conservative.

The BLS estimates that the 1975 work force will exceed that in 1966 by 43 percent. This projection is not directly comparable with the first two, since it does not treat the same occupations. The principal differences between the BLS projection and others are related to the relatively limited growth which BLS foresees for baccalaureate-level personnel and to the continued high rate of growth which BLS projects for sub-baccalaureate allied medical and nursing manpower.

<sup>1</sup> BLS projections to 1980 are in process.

Appendix table E-1. HEALTH MANPOWER REQUIREMENTS: 1966 AND 1975 ESTIMATES

Occupation	Number of workers in 1966	Percent increase required by 1975 on the basis of:		
		Professional judgements	Highest region	BLS projection
All health occupations.....	2,726,200	34	36	43
Selected medical allied occupations:				
Baccalaureate level, total.....	114,000	165	35	76
Clinical laboratory technologist.....	40,000	75	31	88
Dietitian and nutritionist.....	50,000	.....	.....	27
Medical record librarian.....	12,000	33	1	50
Occupational therapist.....	6,500	731	92	200
Physical therapist.....	12,500	332	42	116
Speech pathologist and audiologist.....	13,000	123	42	.....
Sub-baccalaureate level, total.....	112,000	.....	.....	64
Clinical lab technician and aide.....	50,000	.....	.....	100
Radiologic technician.....	72,000	39	28	39



Appendix table E-1. HEALTH MANPOWER REQUIREMENTS: 1966 AND 1975  
ESTIMATES—Continued

Occupation	Number of workers in 1966	Percent increase required in 1966 on the basis of hospital judgment	
		National average <sup>1</sup>	Regionally adjusted <sup>2</sup>
<i>Hospital manpower only</i>			
All professional and technical.....	1,332,100	19	.....
Selected medical allied occupations:			
Baccalaureate level, total.....	73,100	26	32
Clinical laboratory technologist.....	<sup>3</sup> 36,500	17	
Dietitian and nutritionist.....	12,700	28	
Medical record librarian.....	6,300	29	
Occupational therapist.....	4,100	56	
Physical therapist.....	8,500	34	
Recreation therapist.....	3,800	42	
Speech pathologist and audiologist.....	1,200	47	
Sub-baccalaureate level, total.....	125,700	19	25
Clinical lab technician and aide.....	<sup>3</sup> 36,500	17	
Food service manager.....	5,400	16	
Medical record technician.....	10,100	18	
Occupational therapy assistant.....	3,800	31	
Pharmacy aide.....	5,600	17	
Physical therapy assistant.....	5,200	21	
Radiologic technician and aide.....	30,000	16	
Physician's aide (surgical).....	17,600	22	
Electrocardiograph technician.....	5,900	14	
Inhalation therapist and aide.....	5,600	40	

<sup>1</sup> Based on a summation of the perceived needs of individual hospitals.

<sup>2</sup> Based on perceived needs of hospitals in each PHS region, adjusted so that each regional requirement is at least equal to the national average.

<sup>3</sup> One-half of all clinical laboratory staff and requirements (medical technologists, laboratory assistants, and histologic technicians) have been arbitrarily designated as baccalaureate level.

Sources:

*Health Manpower Perspective: 1967*. Public Health Service Publication No. 1667. Washington, Government Printing Office, 1967.

*Health Manpower, 1966-75: A Study of Requirements and Supply*. Bureau of Labor Statistics Report No. 323. June 1967.

*Manpower Resources in Hospitals—1966*. Chicago, American Hospital Association, 1967.

The higher "Professional Judgments" projection for baccalaureate-level manpower is partially explained by the exclusion of dietitians and nutritionists (predicted to increase by only 27 percent by BLS). Principally, however, the difference illustrates a basic divergence in approach to the problem. The BLS projection attempts to forecast industry employment requirements as they will exist under the most probable set of future circumstances; professional judgments consider, in addition, what increases in employment would result in improved patient care.

Another major source of information about health manpower requirements is the nation's hospitals, which constitute the largest group of employers in the field—1,332,000 professional and technical health workers in 1966. In that year, hospitals were asked to estimate their manpower requirements, in terms of budgeted vacancies and additional non-budgeted personnel "needed on the basis of current services and patient load."

For the United States as a whole, all types of hospitals combined reported that about 10 percent of their budgeted positions were vacant, and that approximately another 10 percent increase in staff would be required to give optimum care. This reported staffing deficit is somewhat lower than estimates obtained from other sources which have considered total rather than just hospital manpower needs. Analysis of the responses indicates that hospitals were conservative in estimating their needs, since in some States the total manpower requirements perceived by the hospitals—current staff, budgeted vacancies, and non-budgeted needs—were below average U.S. hospital staffing levels at that time. In view of this, it appears that reported hospital manpower needs do not contradict other estimates of the extent of current shortages.

### Regional Variations in Manpower Requirements

As perceived and reported by hospitals, manpower requirements vary considerably from one region to another, apparently as much or more due to differences in standards of medical care and staffing as to actual service requirements. Examination of data from the 1966 survey reveals that hospital administrators in States with the least hospital manpower generally had smaller requirements per patient for "optimum care" than did hospital authorities in States with a high supply of manpower. Apparently those hospitals in regions with a meager supply of manpower requested the relatively few additional numbers of personnel whom they could envision, anticipating only a gradual rise in medical standards. Meanwhile, hospitals in regions with more lavish supplies of manpower often requested significant increases in their staffs in order to achieve even higher levels of care.

Geographic differences in perceived needs can be illustrated by discussing a specific occupation in relation to hospital beds. For example, among the Public Health Service regions (as they existed in 1968) the 1966 perceived needs for physical therapists per 100 occupied hospital beds in the Pacific and Mountain regions were about double those in the South.

<u>PHS Region</u>	<u>Physical therapists employed by hospitals, per 100 hospital beds: 1966</u>	
	<u>Supply</u>	<u>Perceived need</u>
Total United States .....	.60	.81
VIII. Mountain .....	.93	1.30
IX. Pacific .....	.86	1.09
V. East North Central .....	.83	1.02
VI. West North Central .....	.58	.82
I. New England .....	.60	.81
VII. South Central .....	.55	.74
II. Middle Atlantic .....	.48	.69
III. South Atlantic .....	.44	.60
IV. South .....	.36	.52

Perceived needs are not inversely related to the actual level of staffing that exists in a region, as might be expected. For example, the hospitals in the Pacific and Mountain regions already have a relatively high ratio of physical therapists to patients yet still perceive large additional needs. In regions less well off additional personnel would be necessary to meet the national standard of quality over and above their own perceived need.

Regional differences in hospital manpower requirements for medical allied occupations are presented in table E-2. The regions that showed relatively large requirements for baccalaureate-level personnel nearly always reported large requirements for sub-baccalaureates. The Pacific and Mountain regions indicated high needs for additional personnel; the South, low.

Appendix table E-2. HOSPITAL MANPOWER REQUIREMENTS FOR SELECTED MEDICAL ALLIED OCCUPATIONS, BASED ON SUMMATION OF PERCEIVED NEEDS OF INDIVIDUAL HOSPITALS: PHS REGIONS, 1966

PHS region	Baccalaureate level <sup>1</sup>			Sub-baccalaureate level <sup>2</sup>			Rank of percentages	
	Number of workers in 1966	Additions required in 1966		Number of workers in 1966	Additions required in 1966		Baccalaureate	Sub-baccalaureate
		Number	Per cent		Number	Per cent		
I. New England..... (Conn., Maine, Mass., N.H., R.I., Vt.)	5,611	1,196	21	6,470	1,042	16	8	7
II. Middle Atlantic..... (Del., N.J., N.Y., Pa.)	14,221	4,119	29	15,905	3,561	22	1	2
III. South Atlantic..... (D.C., Ky., Md., N.C., Va., W.Va.)	6,001	1,482	25	7,174	1,439	20	5	4
IV. South..... (Ala., Fla., Ga., Miss., S.C., Tenn.)	5,869	1,683	29	7,446	1,764	24	2	1
V. East North Central..... (Ill., Ind., Mich., Ohio, Wis.)	14,465	3,222	22	16,059	3,004	19	6	5
VI. West North Central..... (Iowa, Kans., Minn., Mo., Neb., N.D., S.D.)	5,912	1,538	26	6,352	1,070	17	3	6
VII. South Central..... (Ark., La., N.Mex., Okla., Tex.)	5,941	1,509	25	7,147	1,467	21	4	3
VIII. Mountain..... (Colo., Idaho, Mont., Utah, Wyo.)	1,937	428	22	2,187	298	14	7	9
IX. Pacific..... (Alaska, Ariz., Calif., Hawaii, Nev., Oreg., Wash.)	9,274	1,647	18	10,043	1,439	14	9	8

<sup>1</sup> Clinical laboratory technologist, dietitian and nutritionist, medical record librarian, occupational therapist, and physical therapist.

<sup>2</sup> Clinical laboratory technician and aide, medical record

technician, occupational therapy assistant, inhalation therapy aide, and radiologic technician.

Source: Unpublished data; see *Manpower Resources in Hospitals—1966*. Chicago, American Hospital Association, 1967

PRELIMINARY NOTIFICATION OF NEW GRADUATE PROGRAM  
PROPOSED PLAN B MASTER'S DEGREE PROGRAM  
MAJOR: PHYSICAL THERAPY

NEED FOR PROGRAM:

A severe shortage of teaching personnel exists in the field of physical therapy. Qualified teachers are needed to maintain the present 53 educational programs leading to professional qualification in physical therapy as well as to staff new curricula now in the planning stage. These university curricula not only need instructors in the academic program but also require clinical instructors and supervisors to provide the clinical phase of their education.

Changes in the patterns of health care are creating changes in the responsibilities of physical therapists, with increased emphasis on expertise in evaluation, in supervision, and in management of out-of-hospital care of long term rehabilitation patients. Experienced physical therapists have expressed need for updating their skills in these areas. The advent of the technical physical therapy assistant three years ago has placed more emphasis on the supervision of these two levels of allied health personnel in physical therapy.

In addition, the rapid growth of the two year junior college curricula to train these physical therapy assistants has created need for additional teachers and clinical supervisors to manage these programs. St. Mary's Junior College, Minneapolis, was one of the first of the twenty such junior college programs now in operation nationwide.

Professional and economic considerations point up the need for a twelve month master's degree program with the breadth of courses provided in a Plan B program to meet the needs of the physical therapy field for teachers and clinical supervisors.

OBJECTIVES OF PROGRAM:

To prepare qualified physical therapists for careers in academic and clinical teaching and supervision in physical therapy.

RELATIONSHIP TO EXISTING GRADUATE PROGRAM:

The Department of Physical Medicine and Rehabilitation currently offers a Graduate School program leading to a master of science degree with a major in physical therapy. This two year Plan A program has placed equal emphasis on advanced course work and on research and thesis. Of the eleven universities in the country offering graduate study for physical therapists, Minnesota is one of two which has maintained a program of this length and with this much emphasis on research. Neither of these schools has had more than two students per year.

The proposed Plan B master's program is intended to provide more breadth of course work, less emphasis on a major research project and permit completion of the program in a minimum of one year. No similar program is available in Minnesota.

FACULTY IN MAJOR FIELD:

Present graduate faculty in the Department of Physical Medicine and Rehabilitation number fifteen, seven of whom are physical therapists. All of the physical therapy faculty have responsibilities in the undergraduate physical therapy curriculum.

RELATED FIELDS:

Education (including Educational Administration, Educational Psychology, History and Philosophy of Education)  
Psychology, Child Psychology, Public Health, Sociology, Business Administration, Industrial Relations.  
Previous Plan A students have either had minors or electives in most of these related fields. Several physical therapists have majored in either educational psychology or public health.

STUDENTS:

Until additional faculty positions are approved, no more than five students could be accepted during the first year.  
Anticipated number within five years: 12 to 15.

DESIRED DATE OF IMPLEMENTATION: September, 1971.

Medical Allied Health Manpower Requirements and  
Supply: 1967, 1975, and 1980

OCCUPATIONAL CATEGORY	ITEM	1967	1975	1980
<b>TOTAL ALLIED HEALTH</b>				
MANPOWER.....	Requirements	1,034,200	1,466,000	1,776,000
	Supply	806,500	1,144,000	1,372,000
	Deficit	227,700	322,000	404,000
<b>AT LEAST BACCALAUREATE:</b>				
Medical.....	Requirements	225,000	348,000	413,000
	Supply	175,000	270,000	320,000
	Deficit	50,000	78,000	93,000
<b>LESS THAN BACCALAUREATE:</b>				
Medical.....	Requirements	336,500	488,000	580,000
	Supply	276,500	400,000	475,000
	Deficit	60,000	88,000	105,000

Source: Public Health Service estimates.

Notes: Figures in this table do not include licensed practical nurses, nurses aides, orderlies, or attendants.

## National Estimates of Manpower Requirements

Recent sources of national estimates of health manpower requirements are: (1) assembled professional judgments, (2) a computation of the manpower required to provide in each of the four Census regions of the United States the manpower available in the region with the highest rate of utilization, (3) manpower projections by the Bureau of Labor Statistics,<sup>1</sup> and (4) needs for additional manpower as reported in a 1966 survey of hospitals. These estimates are summarized in table E-1.

The first two sources forecast 1975 additional requirements of 34 percent and 36 percent in excess of the 1966 number of workers in all health occupations. In view of the recent high rate of growth of the economy and of increasing investment in health care, these forecasts seem to be conservative.

The BLS estimates that the 1975 work force will exceed that in 1966 by 43 percent. This projection is not directly comparable with the first two, since it does not treat the same occupations. The principal differences between the BLS projection and others are related to the relatively limited growth which BLS foresees for baccalaureate-level personnel and to the continued high rate of growth which BLS projects for sub-baccalaureate allied medical and nursing manpower.

<sup>1</sup> BLS projections to 1980 are in process.

Appendix table E-1. HEALTH MANPOWER REQUIREMENTS: 1966 AND 1975 ESTIMATES

Occupation	Number of workers in 1966	Percent increase required by 1975 on the basis of:		
		Professional judgements	Highest region	BLS projection
All health occupations.....	2,786,200	34	36	43
Selected medical allied occupations:				
Baccalaureate level, total.....	114,000	165	35	76
Clinical laboratory technologist.....	40,000	75	31	88
Dietitian and nutritionist.....	30,000	.....	.....	27
Medical record librarian.....	12,000	33	1	50
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Physical therapist.....	12,500	332	42	116
Speech pathologist and audiologist.....	13,000	123	42	.....
Sub-baccalaureate level, total.....	122,000	.....	.....	64
Clinical lab technician and aide.....	50,000	.....	.....	100
Radiologic technician.....	72,000	39	28	39



Appendix table E-1. HEALTH MANPOWER REQUIREMENTS: 1966 AND 1975  
ESTIMATES—Continued

Occupation	Number of workers in 1966	Percent increase required in 1966 on the basis of hospital judgment	
		National average <sup>1</sup>	Regionally adjusted <sup>2</sup>
<i>Hospital manpower only</i>			
All professional and technical.....	1,332,100	19	.....
Selected medical allied occupations:			
Baccalaureate level, total.....	73,100	26	32
Clinical laboratory technologist.....	<sup>3</sup> 36,500	17	
Dietitian and nutritionist.....	12,700	28	
Medical record librarian.....	6,300	29	
Occupational therapist.....	4,100	56	
Physical therapist.....	8,500	34	
Recreation therapist.....	3,800	42	
Speech pathologist and audiologist.....	1,200	47	
Sub-baccalaureate level, total.....	125,700	19	25
Clinical lab technician and aide.....	<sup>3</sup> 36,500	17	
Food service manager.....	5,400	16	
Medical record technician.....	10,100	18	
Occupational therapy assistant.....	3,800	31	
Pharmacy aide.....	5,600	17	
Physical therapy assistant.....	5,200	21	
Radiologic technician and aide.....	30,000	16	
Physician's aide (surgical).....	17,600	22	
Electrocardiograph technician.....	5,900	14	
Inhalation therapist and aide.....	5,600	40	

<sup>1</sup> Based on a summation of the perceived needs of individual hospitals.

<sup>2</sup> Based on perceived needs of hospitals in each PHS region, adjusted so that each regional requirement is at least equal to the national average.

<sup>3</sup> One-half of all clinical laboratory staff and requirements (medical technologists, laboratory assistants, and histologic technicians) have been arbitrarily designated as baccalaureate level.

Sources:

*Health Manpower Perspective: 1967*. Public Health Service Publication No. 1667. Washington, Government Printing Office, 1967.

*Health Manpower, 1966-75: A Study of Requirements and Supply*. Bureau of Labor Statistics Report No. 323. June 1967.

*Manpower Resources in Hospitals—1966*. Chicago, American Hospital Association, 1967.

*anyone at all of them no formal program then part of you have at all level*

The higher "Professional Judgments" projection for baccalaureate-level manpower is partially explained by the exclusion of dietitians and nutritionists (predicted to increase by only 27 percent by BLS). Principally, however, the difference illustrates a basic divergence in approach to the problem. The BLS projection attempts to forecast industry employment requirements as they will exist under the most probable set of future circumstances; professional judgments consider, in addition, what increases in employment would result in improved patient care.

Another major source of information about health manpower requirements is the nation's hospitals, which constitute the largest group of employers in the field—1,332,000 professional and technical health workers in 1966. In that year, hospitals were asked to estimate their manpower requirements, in terms of budgeted vacancies and additional non-budgeted personnel "needed on the basis of current services and patient load."

For the United States as a whole, all types of hospitals combined reported that about 10 percent of their budgeted positions were vacant, and that approximately another 10 percent increase in staff would be required to give optimum care. This reported staffing deficit is somewhat lower than estimates obtained from other sources which have considered total rather than just hospital manpower needs. Analysis of the responses indicates that hospitals were conservative in estimating their needs, since in some States the total manpower requirements perceived by the hospitals—current staff, budgeted vacancies, and non-budgeted needs—were below average U.S. hospital staffing levels at that time. In view of this, it appears that reported hospital manpower needs do not contradict other estimates of the extent of current shortages.

### Regional Variations in Manpower Requirements

As perceived and reported by hospitals, manpower requirements vary considerably from one region to another, apparently as much or more due to differences in standards of medical care and staffing as to actual service requirements. Examination of data from the 1966 survey reveals that hospital administrators in States with the least hospital manpower generally had smaller requirements per patient for "optimum care" than did hospital authorities in States with a high supply of manpower. Apparently those hospitals in regions with a meager supply of manpower requested the relatively few additional numbers of personnel whom they could envision, anticipating only a gradual rise in medical standards. Meanwhile, hospitals in regions with more lavish supplies of manpower often requested significant increases in their staffs in order to achieve even higher levels of care.

Geographic differences in perceived needs can be illustrated by discussing a specific occupation in relation to hospital beds. For example, among the Public Health Service regions (as they existed in 1968) the 1966 perceived needs for physical therapists per 100 occupied hospital beds in the Pacific and Mountain regions were about double those in the South.

<u>PHS Region</u>	<u>Physical therapists employed by hospitals, per 100 hospital beds: 1966</u>	
	<u>Supply</u>	<u>Perceived need</u>
Total United States .....	.60	.81
VIII. Mountain .....	.98	1.30
IX. Pacific .....	.86	1.09
V. East North Central .....	.83	1.02
* VI. West North Central .....	.58	.82
I. New England .....	.60	.81
VII. South Central .....	.55	.74
II. Middle Atlantic .....	.48	.69
III. South Atlantic .....	.44	.60
IV. South .....	.36	.52

Perceived needs are not inversely related to the actual level of staffing that exists in a region, as might be expected. For example, the hospitals in the Pacific and Mountain regions already have a relatively high ratio of physical therapists to patients yet still perceive large additional needs. In regions less well off additional personnel would be necessary to meet the national standard of quality over and above their own perceived need.

Regional differences in hospital manpower requirements for medical allied occupations are presented in table E-2. The regions that showed relatively large requirements for baccalaureate-level personnel nearly always reported large requirements for sub-baccalaureates. The Pacific and Mountain regions indicated high needs for additional personnel; the South, low.

Appendix table E-2. HOSPITAL MANPOWER REQUIREMENTS FOR SELECTED MEDICAL ALLIED OCCUPATIONS, BASED ON SUMMATION OF PERCEIVED NEEDS OF INDIVIDUAL HOSPITALS: PHS REGIONS, 1966

PHS region	Baccalaureate level <sup>1</sup>			Sub-baccalaureate level <sup>2</sup>			Rank of percentages	
	Number of workers in 1966	Additions required in 1966		Number of workers in 1966	Additions required in 1966		Baccalaureate	Sub-baccalaureate
		Number	Per-cent		Number	Per-cent		
I. New England..... (Conn., Maine, Mass., N.H., R.I., Vt.)	5,611	1,196	21	6,470	1,042	16	8	7
II. Middle Atlantic..... (Del., N.J., N.Y., Pa.)	14,221	4,119	29	15,905	3,561	22	1	2
III. South Atlantic..... (D.C., Ky., Md., N.C., Va., W.Va.)	6,001	1,482	25	7,174	1,439	20	5	4
IV. South..... (Ala., Fla., Ga., Miss., S.C., Tenn.)	5,869	1,683	29	7,446	1,764	24	2	1
V. East North Central..... (Ill., Ind., Mich., Ohio, Wis.)	14,465	3,222	22	16,059	3,004	19	6	5
VI. West North Central..... (Iowa, Kans., Minn., Mo., Neb., N.D., S.D.)	5,912	1,538	26	6,352	1,070	17	3	6
VII. South Central..... (Ark., La., N.Mex., Okla., Tex.)	5,941	1,509	25	7,147	1,467	21	4	3
VIII. Mountain..... (Colo., Idaho, Mont., Utah, Wyo.)	1,937	428	22	2,187	298	14	7	9
IX. Pacific..... (Alaska, Ariz., Calif., Hawaii, Nev., Oreg., Wash.)	9,274	1,647	18	10,043	1,439	14	9	8

<sup>1</sup> Clinical laboratory technologist, dietitian and nutritionist, medical record librarian, occupational therapist, and physical therapist.

<sup>2</sup> Clinical laboratory technician and aide, medical record

technician, occupational therapy assistant, inhalation therapy aide, and radiologic technician.

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PROPOSAL OF NEW GRADUATE PROGRAM  
PLAN B MASTER'S DEGREE PROGRAM  
MAJOR: PHYSICAL THERAPY

I. NEED FOR PROGRAM;

A severe shortage of teaching personnel exists in the field of physical therapy. Qualified teachers are needed to maintain the present 53 educational programs leading to professional qualification in physical therapy as well as to staff new curricula now in the planning stage. These university curricula not only need instructors in the academic program but also require clinical instructors and supervisors to provide the clinical phase of their education.

Changes in the patterns of health care are creating changes in the responsibilities of physical therapists, with increased emphasis on expertise in evaluation, in supervision, and in management of out-of-hospital care of long term rehabilitation patients. Experienced physical therapists have expressed need for updating their skills in these areas. The advent of the technical physical therapy assistant three years ago has placed more emphasis on the supervision of these two levels of allied health personnel in physical therapy.

In addition, the rapid growth of the two year junior college curricula to train these physical therapy assistants has created need for additional teachers and clinical supervisors to manage these programs. St. Mary's Junior College, Minneapolis, was one of the first of the twenty such junior college programs now in operation nationwide.

Professional and economic considerations point up the need for a twelve month master's degree program with the breadth of courses provided in a Plan B program to meet the needs of the physical therapy field for teachers and clinical supervisors.

II. OBJECTIVES OF PROGRAM

To prepare qualified physical therapists for careers as:

1. Instructors in accredited curricula in physical therapy.
2. Instructors and administrators for junior college curricula training physical therapy assistants.
3. Clinical instructors and supervisors for clinical teaching of both physical therapy students and physical therapy assistant students.

### III. ADMISSION REQUIREMENTS:

1. Bachelor's degree with evidence of sufficient academic ability to indicate success in graduate study. (GPA of B or above in major subjects).
2. Completion of a physical therapy curriculum accredited by the Council on Medical Education in collaboration with the American Physical Therapy Association.
3. Two letters of reference from professional persons qualified to comment on applicant's academic or professional capability.
4. Two year's experience in the practice of physical therapy is recommended.

### IV. REQUIREMENTS FOR MASTER OF SCIENCE DEGREE (PLAN B):

1. Minimum of 45 quarter credits in graduate courses with GPA of 2.80. Average of 3.0 required in major courses.
2. At least 21 credits in major field (physical therapy).
3. Not less than 18 of the 45 credits should be offered in at least two related fields with a minimum of 6 credits required in each. The related fields should be selected by the student in consultation with his major adviser with consideration of the student's background and goals in graduate study.
4. One or two plan B papers representing the quality but not the range of the master's thesis shall be prepared in independent study under faculty supervision and involve a total of nine credits. At least one of these should be in the major field.
5. Written examination in major field.
6. Oral examination by committee of three, two from the major field and one from a related field. The student will make available to the committee the Plan B papers prepared to fulfill the requirement of nine credits of independent work.
7. All requirements must be completed within seven years, including all graduate work transferred from University Extension or from other universities. Acceptance of transfer credits is subject to approval of the major department with a maximum of nine credits considered.

### V. CONTENT OF PROGRAM

Physical therapists present great diversity in backgrounds since many entered the field of physical therapy after completing a baccalaureate degree in a related field, such as nursing, education or biological science. They also present diversity of clinical experience. The program for each student

V. CONTENT OF PROGRAM (CONT.)

must be planned with consideration of the individual's background and his goals in graduate study.

Sample models of three programs follow:

MODEL CURRICULUM I.  
GOAL: UNIVERSITY INSTRUCTOR

MAJOR FIELD: PHYSICAL THERAPY

- 8-180/8-181      Physiological Bases for Therapeutic Exercise (6)  
P.Med. 8172/8-173 Educational Administration in Physical Therapy (6)  
P.Med. 8-130      Current Literature Seminar (2-3)  
P.Med. 8-170      Special Topics in Physical Therapy (2)  
P.Med. 8-185      Problems in Physical Therapy (3-5)  
P.Med. 8-192      Research Design (3)

RELATED FIELD: Educational Psychology

- PsyF 5-110      Introductory Statistical Methods (3)  
PsyF 5-120      Educational Measurement in the Classroom (3)  
PsyF 5-140      Introd. to Learning and Cognition  
HEd 5-182      Comparative Philosophies of Education (3)  
Educ 8-252      Effective College Teaching (3)

RELATED FIELD: PUBLIC HEALTH

- PH 5-002      Elements of Public Health (3)  
PH 5-790      Social and Economic Aspects of Medical Care (3)  
PH 5-518      Long Term Patient Care & Rehabilitation (1-3)  
PH 5-520      Field Practive: Physical Therapy in Community Agencies (ar)



MODEL CURRICULUM II.  
GOAL: JUNIOR COLLEGE TEACHING

MAJOR FIELD: PHYSICAL THERAPY

- 8-180/8-181            Physiological Bases for Therapeutic Exercise (6)  
P.Med. 8-172/8-173 Educational Administration in Physical Therapy (6)  
P.Med. 8-130            Current Literature Seminar (2-3)  
P.Med. 8-170            Special Topics in Physical Therapy (2)  
P.Med. 8-185            Problems in Physical Therapy (3-5)  
P.Med. 8-192            Research Design (3)

RELATED FIELD: EDUCATIONAL ADMINISTRATION

- EdAd 8-274            The Junior College (3)  
EdAd 8-275            Junior College Administration (3)  
Educ 8-252            Effective College Teaching (3)  
PsyF 5-110            Introductory Statistical Methods (3)  
CSPP 5-110            Counseling Procedures (3)

RELATED FIELD: PSYCHOLOGY

- Psy 5-001            Theories of Learning (3)  
Psy 5-201            Social Psychology (3)

Electives:

- PH 5-790            Social and Economic Aspects of Medical Care (3)

MODEL CURRICULUM III  
GOAL: CLINICAL SUPERVISOR

MAJOR: PHYSICAL THERAPY

- 8-103 Physical Therapy Clinic (3)  
8-130 Current Literature Seminar (2-3)  
8-171 Administration of Physical Therapy Services (3)  
8-192 Research Design (3)  
8-180/8-181 Physiological Bases for Therapeutic Exercise (6)  
8-170 Special Topics in Physical Therapy (3)

RELATED FIELD: BUSINESS ADMINISTRATION

- Mgmt 8-001 Fundamentals of Management (3)  
Mgmt 8-007 Superior-Subordinate Problems (3)

RELATED FIELD: PUBLIC HEALTH

- PH 5-002 Elements of Pub. Health (2)  
PH 5-790 Social and Economic Aspects of Health Care (3)  
PH 5-507 Group Dynamics (2)  
PH 5-518 Long Term Patient Care & Rehabilitation (3)

ELECTIVES:

- Soc. 5-421 Occupational Sociology (3)  
IR 5-003 Interpersonal Perception: The Employment Interview (3)  
CPsy 5-319 Clinical Procedures with Children (3)

## Plan B Program in Physical Therapy

### Related Fields

#### EDUCATION

Educ 8-250 Higher Education in the United States (3 cr)  
Educ 8-251 Curriculum Trends in American Colleges (3)  
Educ 8-252 Effective College Teaching (3)  
Educ 8-254 Directed Experience in College Instruction (cr arr)

#### EDUCATIONAL ADMINISTRATION

EdAd 8-201/8-202 Foundation of Educational Administration (3)  
EdAd 8-253 Administration in Higher Education (3)  
EdAd 8-274 The Junior College (3)  
EdAd 8-275 Junior College Administrations (3)  
EdAd 8-291 Public Relations for Colleges and Universities (3)

#### EDUCATIONAL PSYCHOLOGY

CSPP 5-110 Counseling Procedures (3)  
CSPP 8-540 Seminar: The College Student (1-3 cr)  
PsyF 5-110 Introductory Statistical Methods (3)  
PsyF 5-310 Introductory Statistical Methods - Laboratory (2)  
PsyF 5-120 Educational Measurement in the Classroom (3)  
PsyF 5-122 Instruments and Techniques of Measurement (3)  
PsyF 5-140 Introduction to Learning and Cognition (3)  
PsyF 5-160 Personality Development and Mental Hygiene (3)  
PsyF 5-170 Social Psychology of Education (3)  
PsyF 5-174 Orientation and Mobility for Blind Children (3)  
SpEd 8-120 Psychological Theory and Research in Mental Retardation (3)  
SpEd 8-121 Functional Analysis of Behavior in Mental Retardation (3)

#### HISTORY AND PHILOSOPHY OF EDUCATION

HEd 5-101 Historical Foundations of Modern Education (3)  
HEd 5-131 Comparative Education (3)  
HEd 5-141 Critical Issues in Contemporary Education (3)  
HEd 5-171 Anthropology and Education (3)  
HEd 5-182 Comparative Philosophies of Education (3)

#### CHILD PSYCHOLOGY

CPSY 5-313 Psychology of Handicapped Children (3)  
CPSY 5-319 Clinical Procedures with Children (3)  
CPSY 5-341 Sensory and Motor Development (3)  
CPSY 8-341 Perception in Children (3)

## PSYCHOLOGY

Psy 5-001	Theories of Learning (3)
Psy 5-012/5-013	Psychology of Learning (3/qt)
Psy 5-101/5-102	Personality (3/qt)
Psy 5-125/5-126	Differential Psychology (3/qt)
Psy 5-201	Social Psychology (3)
Psy 5-604/5-605	Abnormal Psychology (3/qt)
Psy 5-061	Physiological Psychology (3)
Psy 5-031	Perception
Psy 5-701	Personnel and Industrial Psychology
Psy 5-702	Psychology of Individual Behavior in Organizations (3)

## SOCIOLOGY

Soc. 5-201	Social Psychology (3)
Soc. 5-421	Occupational Sociology (3)
Soc. 5-855	Sociology of Medicine, Medical Institutions (3)

## PUBLIC HEALTH

P.H. 5-002/5-003/5-004	Elements of Public Health I, II, III (3 cr/qt)
P.H. 5-407	Vital Statistics (3 crs)
P.H. 5-507	Group Dynamics (2 crs)
P.H. 5-518/5-519	Long Term Patient Care and Rehabilitation (arr cr)
P.H. 5-520	Field Practice: Physical Therapy in Community Agencies (arr cr)
P.H. 5-790	Social and Economic Aspects of Medical Care (3 cr)
P.H. 5-700	Public Health Administration (3 cr)
P.H. 8-506	Health Behavior and Socio-cultural Change (3 cr)

## BUSINESS ADMINISTRATION

Mgmt 8-001	Fundamentals of Management (3)
Mgmt 8-006	Executive Leadership (3)
Mgmt 8-007	Superior-Subordinate Problems (3)
Mgmt 8-801	Seminar: Interpersonal Relations (3)
BLaw 8-158	Business Law: Contracts (3)

## INDUSTRIAL RELATIONS

IR 5-002	Industrial Relations Fundamentals (3)
IR 5-032	Systems of Industrial Relations: Manpower Management (3)
IR 5-003	Interpersonal Perception: the Employment Interview (3)

## FACILITIES AND EQUIPMENT

No new facilities nor equipment will be required for initiation of this proposed Plan B master's program. Present facilities and equipment provided for the Plan A program will be utilized. The present clinical services and laboratories within the Department of Physical Medicine and Rehabilitation are adequate for the planned courses and clinical experience. Library holdings are sufficient.

## FUNDING

This department has submitted a grant proposal to the Department of Health Education and Welfare for funding of additional faculty and supplies under the Allied Health Professions federal program. If this grant is received, expansion can proceed at a faster rate. If the grant is not received, the present faculty will maintain the program at the initial limited level of enrollment until such time as additional faculty positions are approved and funded by the university.

For several years the University of Minnesota has been the recipient of an Allied Health Professions training grant providing funds for trainee support. These traineeships have not been utilized in full due to lack of applicants for the two year Plan A program.

PROPOSED DATE OF IMPLEMENTATION: September, 1971.

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Clinical laboratory technologist.....	<sup>3</sup> 36,500	17	
Dietitian and nutritionist.....	12,700	28	
Medical record librarian.....	6,300	29	
Occupational therapist.....	4,100	56	
Physical therapist.....	8,500	34	
Recreation therapist.....	3,800	42	
Speech pathologist and audiologist.....	1,200	47	
Sub-baccalaureate level, total.....	125,700	19	25
Clinical lab technician and aide.....	<sup>3</sup> 36,500	17	
Food service manager.....	5,400	16	
Medical record technician.....	10,100	18	
Occupational therapy assistant.....	3,800	31	
Pharmacy aide.....	5,600	17	
Physical therapy assistant.....	5,200	21	
Radiologic technician and aide.....	30,000	16	
Physician's aide (surgical).....	17,600	22	
Electrocardiograph technician.....	5,900	14	
Inhalation therapist and aide.....	5,600	40	

<sup>1</sup> Based on a summation of the perceived needs of individual hospitals.

<sup>2</sup> Based on perceived needs of hospitals in each PHS region, adjusted so that each regional requirement is at least equal to the national average.

<sup>3</sup> One-half of all clinical laboratory staff and requirements (medical technologists, laboratory assistants, and histologic technicians) have been arbitrarily designated as baccalaureate level.

Sources:

*Health Manpower Perspective: 1967*. Public Health Service Publication No. 1667. Washington, Government Printing Office, 1967.

*Health Manpower, 1966-75: A Study of Requirements and Supply*. Bureau of Labor Statistics Report No. 323. June 1967.

*Manpower Resources in Hospitals—1966*. Chicago, American Hospital Association, 1967.



The higher "Professional Judgments" projection for baccalaureate-level manpower is partially explained by the exclusion of dietitians and nutritionists (predicted to increase by only 27 percent by BLS). Principally, however, the difference illustrates a basic divergence in approach to the problem. The BLS projection attempts to forecast industry employment requirements as they will exist under the most probable set of future circumstances; professional judgments consider, in addition, what increases in employment would result in improved patient care.

Another major source of information about health manpower requirements is the nation's hospitals, which constitute the largest group of employers in the field—1,332,000 professional and technical health workers in 1966. In that year, hospitals were asked to estimate their manpower requirements, in terms of budgeted vacancies and additional non-budgeted personnel "needed on the basis of current services and patient load."

For the United States as a whole, all types of hospitals combined reported that about 10 percent of their budgeted positions were vacant, and that approximately another 10 percent increase in staff would be required to give optimum care. This reported staffing deficit is somewhat lower than estimates obtained from other sources which have considered total rather than just hospital manpower needs. Analysis of the responses indicates that hospitals were conservative in estimating their needs, since in some States the total manpower requirements perceived by the hospitals—current staff, budgeted vacancies, and non-budgeted needs—were below average U.S. hospital staffing levels at that time. In view of this, it appears that reported hospital manpower needs do not contradict other estimates of the extent of current shortages.

### Regional Variations in Manpower Requirements

As perceived and reported by hospitals, manpower requirements vary considerably from one region to another, apparently as much or more due to differences in standards of medical care and staffing as to actual service requirements. Examination of data from the 1966 survey reveals that hospital administrators in States with the least hospital manpower generally had smaller requirements per patient for "optimum care" than did hospital authorities in States with a high supply of manpower. Apparently those hospitals in regions with a meager supply of manpower requested the relatively few additional numbers of personnel whom they could envision, anticipating only a gradual rise in medical standards. Meanwhile, hospitals in regions with more lavish supplies of manpower often requested significant increases in their staffs in order to achieve even higher levels of care.

Geographic differences in perceived needs can be illustrated by discussing a specific occupation in relation to hospital beds. For example, among the Public Health Service regions (as they existed in 1968) the 1966 perceived needs for physical therapists per 100 occupied hospital beds in the Pacific and Mountain regions were about double those in the South.

<u>PHS Region</u>	<u>Physical therapists employed by hospitals, per 100 hospital beds: 1966</u>	
	<u>Supply</u>	<u>Perceived need</u>
Total United States .....	.60	.81
VIII. Mountain .....	.98	1.30
IX. Pacific .....	.86	1.09
V. East North Central .....	.83	1.02
* VI. West North Central .....	.58	.82
I. New England .....	.60	.81
VII. South Central .....	.55	.74
II. Middle Atlantic .....	.48	.69
III. South Atlantic .....	.44	.60
IV. South .....	.36	.52

Perceived needs are not inversely related to the actual level of staffing that exists in a region, as might be expected. For example, the hospitals in the Pacific and Mountain regions already have a relatively high ratio of physical therapists to patients yet still perceive large additional needs. In regions less well off additional personnel would be necessary to meet the national standard of quality over and above their own perceived need.

Regional differences in hospital manpower requirements for medical allied occupations are presented in table E-2. The regions that showed relatively large requirements for baccalaureate-level personnel nearly always reported large requirements for sub-baccalaureates. The Pacific and Mountain regions indicated high needs for additional personnel; the South, low.

Appendix table E-2. HOSPITAL MANPOWER REQUIREMENTS FOR SELECTED MEDICAL ALLIED OCCUPATIONS, BASED ON SUMMATION OF PERCEIVED NEEDS OF INDIVIDUAL HOSPITALS: PHS REGIONS, 1966

PHS region	Baccalaureate level <sup>1</sup>			Sub-baccalaureate level <sup>2</sup>			Rank of percentages	
	Number of workers in 1966	Additions required in 1966		Number of workers in 1966	Additions required in 1966		Baccalaureate	Sub-baccalaureate
		Number	Per-cent		Number	Per-cent		
I. New England..... (Conn., Maine, Mass., N.H., R.I., Vt.)	5,611	1,196	21	6,470	1,042	16	8	7
II. Middle Atlantic..... (Del., N.J., N.Y., Pa.)	14,221	4,119	29	15,905	3,561	22	1	2
III. South Atlantic..... (D.C., Ky., Md., N.C., Va., W.Va.)	6,001	1,482	25	7,174	1,439	20	5	4
IV. South..... (Ala., Fla., Ga., Miss., S.C., Tenn.)	5,869	1,683	29	7,446	1,764	24	2	1
V. East North Central..... (Ill., Ind., Mich., Ohio, Wis.)	14,465	3,222	22	16,059	3,004	19	6	5
VI. West North Central..... (Iowa, Kans., Minn., Mo., Neb., N.D., S.D.)	5,912	1,538	26	6,352	1,070	17	3	6
VII. South Central..... (Ark., La., N.Mex., Okla., Tex.)	5,941	1,509	25	7,147	1,467	21	4	3
VIII. Mountain..... (Colo., Idaho, Mont., Utah, Wyo.)	1,937	428	22	2,187	298	14	7	9
IX. Pacific..... (Alaska, Ariz., Calif., Hawaii, Nev., Oreg., Wash.)	9,274	1,647	18	10,043	1,439	14	9	8

<sup>1</sup> Clinical laboratory technologist, dietitian and nutritionist, medical record librarian, occupational therapist, and physical therapist.

<sup>2</sup> Clinical laboratory technician and aide, medical record

technician, occupational therapy assistant, inhalation therapy aide, and radiologic technician.

Source: Unpublished data; see *Manpower Resources in Hospitals—1966*. Chicago, American Hospital Association, 1967

~~CONFIDENTIAL~~  
June 10, 1971

Dr. Lloyd H. Lofquist  
Assistant Vice President  
Academic Administration  
213 Merrill Hall

Dear Vice President Lofquist:

I am enclosing 30 copies of a final proposal and summary sheet for a M.S. and Ph.D. with a major in Oral Biology.

This proposal, reviewed and recommended by the Medical Sciences Group Committee and approved by the Graduate School Executive Committee on June 3, 1971, is now ready for review by the Minnesota Higher Education Coordinating Commission.

Thank you.

Sincerely yours,

(Mrs.) Shirley McDonald  
Prin Exec Secretary

sm:ms  
enc - 30 proposals

June 3, 1971

Dr. Burton L. Shapiro  
Professor and Chairman  
Division of Oral Biology  
School of Dentistry  
436 Ovre Hall

Dear Dr. Shapiro:

Following the recommendation by the Medical Sciences Group Committee, the Graduate School Executive Committee approved the establishment of the M.S. and Ph.D. with a major in Oral Biology. The graduate course requests and the nominations to the Graduate Faculty in Oral Biology were recommended by the Medical Sciences Group Committee also. Action on the faculty nominations must now come from Dean Crawford.

We can now send your proposal to the Minnesota Higher Education Coordinating Commission for recommendation. Final action must, of course, come from the Board of Regents.

Although your draft looks as though it is fairly complete, you may want to add other information and, of course, entitle it "Final Proposal for a M.S. and Ph.D. with a Major in Oral Biology" -- a preliminary notification does not have to go to the HECC since this one has passed the Graduate School hurdles.

I'm enclosing a sample sheet for the summary sheet which is to be completed in a sentence or two and attached to the top of the final proposal. You will note that this sheet breaks down the HECC guidelines into single statements in some instances, but otherwise is just a shortened version for the HECC members convenience.

We will need 32 sets of the material. As soon as I receive them, I will send them off to the HECC through Vice President Lloyd Lofquist's office.

Any questions you may have about how to proceed on admissions to this major should be directed to Dean Andrew J. Hein in the Graduate School. And if you have any questions I can help you with, please call.

Sincerely yours,

Shirley McDonald  
Vice President

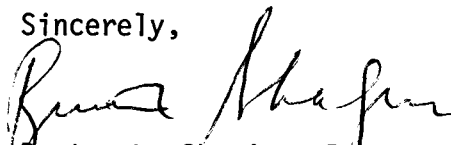
May 12, 1971

Mrs. McDonald  
Graduate School  
333 Johnston Hall

Dear Mrs. McDonald:

Enclosed is a draft of a proposal for a new graduate program in Oral Biology. A copy has been sent to Dr. Lewis Wannamaker. Please let me know if you need any additional information.

Sincerely,



Burton L. Shapiro, D.D.S., Ph.D.  
Professor and Chairman  
Division of Oral Biology

BLS:ms



SUMMARY SHEET

Title of Proposal  
Final Proposal for a M.S. and Ph.D. with  
a Major in Oral Biology

Submitting Institution  
University of Minnesota

Type of Institution  
University

~~Governor's Planning Area~~

Inter-Institutional Planning

Similar existing or proposed programs in  
the state, by location, planning area  
and type of institution

Tentative approval of the institution's governing board  
Approved by Health Sciences Group Committee

Need for the program Training of teachers and researchers  
for dental schools and similar institutions for which there  
are current and projected shortages.

Firm supporting data to establish this need Carnegie  
Commission Report (1970) and American Association of Dental  
Schools (1971) specified existing shortages and need for  
accelerated teacher training for dental schools for future.

Program Objectives Train individuals for academic and  
research careers concerned with problems of the mouth  
and its contained and related tissues, and thus prepare  
them for employment in dental schools and oral research

Content of the program centers.

M.S. and Ph.D. programs with a major in Oral Biology;  
not a clinical program; emphasis on relating basic and applied  
knowledge; teacher training; research training.

Number and type of students to be served

Probably no more than three students will embark on the  
program initially.

Number and type of students to be served five years after the  
inception of the program 15-20 students

Relationship of the proposed program to existing programs  
at the offering institution No apparent conflicts with  
existing programs. Students will register for courses in  
other departments. Similarly course offerings in the program  
will be available to students in other programs.

Relationship of the proposed program to any other similar  
programs offered in the state in both public and private  
institutions No comparable programs offered at this

University or elsewhere in the state.

Additional faculty members needed during the first year of operation none

Total estimated costs for establishing the program initially and on a five year basis No faculty, equipment or renovation costs necessary. Stipends will be sought from NIDR, NIH.

Additional faculty members needed five years after its inception Two or three depending on number of students and outside support.

Suggested sources for any additional funds required to establish the new program We have communicated with NIDR, NIH concerning funds for this training program. Representative of NIDR have supported and encouraged requests for these funds.

Equipment which will be needed to initiate the program none

Equipment needed during the five year period after its inception No major equipment other than that already provided in facilities for the new building to be occupied in 1973.

The indication of any additional laboratory facilities needed to initiate the program none

The indication of any additional laboratory facilities needed during the five year period after its inception None in addition to that programmed into new facilities.

A specific indication that existing library holdings and the current level of support will be sufficient to establish and maintain the new program or an estimate of the additional cost of obtaining sufficient library holdings to initiate the program Diehl Hall Library is excellent and sufficient for this program.

Total estimated costs for establishing the program initially No major costs anticipated. Minor costs will consist of funds for disseminating information about the program and for guest lecturers when appropriate. Funds for these items will be available.



Final Proposal for a M.S. and Ph.D. with a Major in Oral Biology

For Information:  
B. L. Shapiro  
436 Owre Hall  
3-3269

6/9/71

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## A Proposal for a Graduate Program in Oral Biology

The field of Oral Biology is an outgrowth of a need recognized by Dentistry for scientific inquiry into problems specifically related to oral health. Oral Biology may be defined as the study of the oral tissues, their development (including aging), structure, function and pathology. It is concerned with the evolution, development, growth, morphology and function of oral tissues and indeed of the entire oro-facial region. Oral Biology explores the relationships between the physical, biological and behavioral sciences and the oral tissues and focuses on reciprocal effects of the oral cavity, the organism and the environment. Similar to Oral Biology programs in other dental schools in the United States and Canada the one at Minnesota has been established through the association of investigators from diverse academic and research backgrounds including non-dentists but with common interest in problems of Oral Biology. The extent of the development of this field is in part reflected by international periodicals devoted to Oral Biology and related areas, e.g. Archives of Oral Biology, Journal of Dental Research, Caries Research, Journal of Periodontal Research, Advances in Oral Biology, etc.

*It is proposed that a program leading to the M.S. and Ph.D. degrees with a major in Oral Biology be offered at the University of Minnesota; that the major in Oral Biology be a program for training individuals for careers in research and teaching in dental and other suitable institutions; that the major in Oral Biology not be construed to be a clinical program; that the graduate faculty in Oral Biology be elected to the graduate faculty of the University as a new graduate faculty for a new program; that the faculty consist of individuals who address themselves to and are in sympathy with clinical problems as well as basic biological problems of oral and related tissues.*

Graduate programs will be designed to prepare individuals primarily for academic roles to fill existing and projected needs in undergraduate and graduate dental education and research.

### Background

The School of Dentistry (Department of Dentistry) consists of a number of Divisions, most of which represent recognized specialties of Dentistry, for example, Oral Surgery, Orthodontics, Oral Pathology, Periodontology, etc. Individuals who obtain post D.D.S. (D.M.D.) specialty training enroll in the Graduate School and following completion of requirements (usually 2 to 3 year programs) receive the Master of Science in Dentistry (M.S.D.) degree. The graduate faculty in Dentistry is represented by the Dental Subcommittee of the Medical Sciences Group Committee of the Graduate School. The Dental School has sponsored no other graduate degrees.

During the last eleven years dentists and dental students (combined programs) have entered programs leading to a Ph.D. in one of several areas, e.g. Biochemistry, Anatomy, Physiology, Microbiology, Genetics and Epidemiology. Students in these programs must satisfy requirements of the major department. Many have chosen a clinical dental specialty as a minor field. Most individuals in these programs have been supported during their

training by grants from the National Institute of Dental Research (NIDR) of the National Institutes of Health (NIH). These programs have been extremely successful in terms of completion of programs and in terms of individuals entering and remaining in active academic teaching and research positions.

In 1967 a committee was formed by Dean Schaffer of the School of Dentistry to review graduate dental programs. Among conclusions of the report was the following: "a significant body of information exists that forms or should form the basis for all graduate education in Dentistry. Some of these areas are offered or discussed in several Divisions in the Dental School and in other Departments of the College of Medical Sciences. However much pertinent material is not available to graduate students of this University and in most cases where it is available emphases are often not directed to oral problems. Several Divisions in the Dental School have already initiated excellent courses and seminars dealing with the biological and pathological principles upon which their own specialties are based. The committee felt that these courses should be continued but that in addition a more general approach to the biological principles upon which specialty practice is predicated should be offered and would be desirable for training of all graduate students".

In 1968 the Division of Oral Biology was formed. Several courses at the graduate level by the Division have been approved by the Graduate School and are offered currently (pp. 6 ).

#### The Proposed Program in Oral Biology According to the Higher Education Coordinating Commission (HECC) Guidelines

##### I. Need for the Program

Approval of the proposed graduate program with a major in Oral Biology at Minnesota would fulfill several needs: It would enhance the training of needed dental educators. It would focus at the graduate level on research problems and research training concerned with problems of oral biology and disease. In addition, the establishment of such a program at Minnesota would acknowledge a graduate discipline already recognized in several other Universities (Appendix 1).

##### a. Dental education - need for faculty

The Annual Report on Dental Education (1969/1970) published by the American Dental Association Council on Dental Education lists 85 faculty vacancies in biomedical sciences departments and 292 vacancies in clinical departments in 53 U.S. dental schools. These vacancies are based on positions included in current school budgets. This listing does not include reports from 6 new schools. According to Dr. John J. Salley, Dean of the University of Maryland School of Dentistry, "... Unless an increasing number of dentists are encouraged and given the opportunity to enroll in teacher-training programs the dental teacher shortage in 1975 will be even more alarming than it is today". Projected dental teacher needs by 1975 are formidable - a minimum of 1200 new full-time and 2200 part-time teachers (from a survey by Dr. J. Sinkford for the 1968 Workshop in Graduate Education in Chicago). According to Dean J. W. Bawden (University of North Carolina) these figures "do not

provide for any improvement in faculty - student ratios, nor would they correct severe deficiencies in the staffing of graduate programs in dentistry". The Carnegie Commission Report (CCR) (1970) projected a need for expanding the number of places for training dentists during this decade by 20%. In the American Association of Dental Schools (AADS) response (1971) to the Report the difficulty of projecting accurately was acknowledged but the 20% figure was felt to be "too conservative". The CRS and AADS called attention to already existing shortages of qualified faculty to staff dental institutions. They suggested that provisions must be made for support for additional faculty for new schools. Existing training programs will produce at most 600 new teachers available to the nation's dental schools by 1975 to fulfill needs of training dentists and dental specialists.

There is a need in dental schools and research centers for individuals who have a comprehensive knowledge of oral tissues and their relationships. New dental schools include departments in oral biology as one of their main components and many new programs and departments of oral biology have been and are being established in existing institutions. Only recently have programs in the United States produced individuals trained in oral biology to fill these positions. Perhaps more important in terms of faculty needs and future demand are academicians in dental schools in departments other than oral biology. For example, full time academic faculty positions in clinical specialty areas will probably best be served by clinical specialists who have didactic and research experience relevant to the problems of oral biology and disease. An individual with a broad fundamental perspective would be a most valuable addition to these undergraduate and graduate training programs in dentistry. Dental faculty trained in oral biology would begin to satisfy the recommendation of both the CCR and the AADS that better integration of basic sciences and clinical instruction is needed. We believe that individuals so trained would be in favored positions in comparison with part-time clinically trained individual in terms of job seeking ability.

#### b. Oral Biology - need for researchers

In addition to the need for teachers trained in oral biology there is a strong need for researchers concerned with oral tissues, their functions and abnormalities. Although oral research is being carried out by competent researchers throughout the world a report approved unanimously by the U.S. Senate Appropriations Committee in reporting out the dental appropriation for July 1, 1971 stated that the dental profession has emphasized mechanics of repairing and replacing teeth rather than the "more difficult problems of defining the origins of dental disorders and working toward their prevention and cure. This is all the more surprising because most children and virtually every adult are affected with dental caries. Diseases of the teeth and gums are more common and no less serious than many other diseases on which a great deal of research is being done. Moreover, dental disorders often result in, or contribute to, other health problems that may have serious consequences". The Health Subcommittee of the U.S. Senate Appropriations declared that since there are "limitations imposed by the availability of competent research manpower ... provision for the training of research personnel ... especially ... in areas in which shortages now exist or can be clearly foreseen" should be made.

The following are common, complex and exceedingly important examples of clinical human problems uniquely oral and for which explanations of mechanisms, prevention or treatment are not yet satisfactorily available: dental caries, periodontal diseases, malocclusion, oral cancer, orofacial clefts, and oral mucous membrane diseases. Some data on prevalences of oral disease are given in Appendix 2 in order to demonstrate the magnitude of these problems and the need for continued research.

There are, in addition, innumerable unanswered basic questions about oral tissues. The following are a sample of basic biological problems with a uniquely oral focus: mechanism of tooth eruption, taste, soft tissue - hard tissue attachments, mineralization and destruction of hard tissues, aging of oral tissues, saliva and salivary glands and the interaction of dental biomaterials with soft and hard oral tissues. Many of these phenomena are related to more general biological questions that can be profitably approached through an understanding and study of oral tissues. For example the diversity of oral calcified tissues is unique. The physical anthropological, comparative anatomical, paleontological and clinical data on these tissues are unsurpassed by any other anatomic area. A concerted effort at unifying these data is needed. Information collated and new findings accumulated will shed light on mineralized tissues in oral areas. Moreover, because of their unique characteristics and relationships study of these tissues promises to provide insight into calcified tissues in general. Unusual characteristics of other oral tissues and functions offer similar potential application to general problems of biology and pathology. For example, study of the relationship between oral mucous membranes and oral microbiota, interactions between biomaterials and living oral tissues, salivary glands and their secretions, etc. have implications beyond biology of the mouth. What is needed is a focus on these oral tissues by individuals broadly aware of their structure, functions, interrelations and implications.

Clearly, many if not most of these basic and clinical problems have been approached by individuals trained in traditional disciplines. However, the importance and extent of these problems justify the focus provided by their inclusion under an Oral Biology program. More importantly, the identification of such an area would provide a comprehensive approach to oral phenomena, including physical and behavioral considerations. Without question the biochemist and microbiologist, etc. must continue to generate information basic to oral biological problems. However, the continued segmentation of all oral research along traditional disciplinary lines may be inhibitory to appreciation of the interdependence of oral phenomena. *The greatest need is the bridging by oral biologists of the wide gap that frequently exists between those engaged in basic research and teaching and those in clinical research and teaching.* This need was emphasized by the CCR.

It would appear that contributions of oral research to human problems and to basic biological questions would be best served by individuals trained as generalists in terms of oral tissues. Furthermore, individuals qualified by training to explore and identify interdisciplinary approaches to oral

health problems and basic biological questions unique to oral and related tissues would best serve the needs of undergraduate and graduate dental education and research. It is of course clear that competent research must be based on deep familiarity with a problem and with several research techniques. Accordingly, students in Oral Biology must develop specific research skills and these will be obtained through concentrated dissertation effort in a laboratory with an advisor, through supporting fields and through a minor.

## 2. The program objectives

The aim of the proposed program in Oral Biology is to train individuals for academic and research careers concerned with problems of the mouth and its contained and related tissues, and thus prepare them for employment in dental schools, oral research centers, and other institutions engaged in similar activities. The proposed program is not a clinical program in dentistry or any of its specialties. Hopefully graduates will serve the needs of dental specialties and appropriate medical specialties as well as basic sciences. Some students may choose to obtain specialty training concurrently or at some other time. However, clinical training cannot be used to fulfill requirements for Oral Biology programs.

Graduates of this program will bridge the gap that often exists among the sciences and between the basic and clinical sciences in terms of oral tissues, their functions and diseases. Individuals so educated will be prepared for the much needed activities of: (1) undergraduate dental education, especially the relating of basic and clinical material, (2) graduate dental specialty education, (3) research in clinical oral diseases and abnormal conditions, and (4) research in basic problems best attacked through the use of oral tissues by individuals with an eclectic background.

## 3. The program content

a. Admission requirements. The program is designed for individuals who have completed requirements for graduation with high standing from a dental or medical school and who desire to undertake advanced studies in oral biology. In some cases an individual who has not yet obtained the D.D.S. (D.M.D.) or M.D. degree and has demonstrated exceptional potential for graduate study may be admitted on a combined program. Individuals with bachelors or masters degrees who can demonstrate sufficient background and interest in oral biology will also be considered for admission.

b. Advisory system. Each student will be assigned a temporary advisor immediately upon entering the program. The temporary advisor will be selected by consultation between the student and the director of graduate studies. By the end of the 3rd quarter in residence the student will declare his major interest and select a member of the oral biology graduate faculty as his permanent major advisor. After obtaining the consent of the faculty member, the student will inform the director of graduate studies of his selection. The student may change his advisor if his interests change. This change may be initiated by either the student or the advisor.

c. Major program. During the first year all students must take for credit the courses entitled Biological Basis of Dentistry I and II. These are graduate level courses which consider the problems of oral biology

in more detail and include more basic research and speculative material than that normally introduced in undergraduate dental training.

During each quarter of his first year each student will work with a faculty member to acquire research experience through quarter long apprenticeships. These assignments will be the product of negotiation among the director of graduate studies, the student and the faculty members involved with a view that they reflect the student's interest and provide him with breadth of exposure to faculty activities. Registration will be through OBio 8---- Tutorial in Oral Biology, with credit assignment appropriate to the actual involvement of time (2 hours per week equal 1 credit). Also during the first year the student will be required to attend a weekly seminar in oral biology. Students will receive instruction in techniques and philosophy of education through registration in Dent 8-126 and Dent 8-127, Teaching and Evaluation in Dentistry, or their equivalent. In addition, the student will obtain experience in teaching through participation in undergraduate oral biology or other appropriate courses. Other than these requirements programs will be individually designed by consultation among the student, his advisor and the director of graduate studies.

In suitable situations students will be encouraged to obtain, concurrently, advanced training in a clinical specialty.

d. Courses. Together with his advisor the graduate student will choose a minor or supporting field and choose those areas in the major field of oral biology that will best meet his needs and interests. The following courses are among those for which major credit will be accepted. (Those with course numbers have already been approved by the Graduate School):

OBio 8-001. RESEARCH IN ORAL BIOLOGY. (Cr ar) Staff

OBio 8-010. PRINCIPLES OF ORAL BIOLOGY I.(3 cr)

Basic concepts of cell biology and human biology for dental specialist and/or oral research trainees. Discussions include considerations of cell structure and metabolism, human development and evolution, and biological variation in modern populations. Staff

OBio 8-011. PRINCIPLES OF ORAL BIOLOGY II. (3 cr; prereq 8-010 or #)

Application of fundamentals discussed in 8-010 to structure and function of oral tissues. Subjects include: growth, development and aging, immune mechanisms, calcification and decalcification, regeneration and repair, tissue attachments, secretion and absorption, sensory motor and psychogenic mechanisms. Staff

OBio 8-021, 8-022, 8-023, 8-024. TOPICS IN ORAL BIOLOGY. (1-3 cr [may be repeated for cr]; prereq #)

A different topic or subject area in oral biology is considered in depth each quarter the seminar series is offered; e.g. pain and sensation, aging, biomaterials, hard tissue metabolism, etc.; topics will be announced in advance. Staff

OBio 8-030. SEMINAR: ORAL BIOLOGY. (1 cr [may be repeated for cr])

Oral biology faculty and student participation in discussions of current issues in oral biology. Staff



- OBio ----. TUTORIAL IN ORAL BIOLOGY. (cr ar 2 hrs/wk=1 cr [may be repeated])  
Quarter long apprenticeship with faculty members to familiarize students with faculty research interests. Staff
- OBio ----. DEVELOPMENTAL BIOLOGY OF SALIVARY GLANDS. (2 cr, alt yrs, prereq OBio 8-101 or #) Redman  
Morphologic and biochemical description of the development of salivary glands, including initiation, morphodifferentiation and cytodifferentiation. Cell proliferation vs. cytodifferentiation. Relationships among gland development, gland function, and the development and environment of the animal. Comparison with development of other exocrine organs. Based largely on material from laboratory animals, but with frequent reference to available human material.
- OBio ----. SALIVARY GLANDS AND THEIR SECRETIONS. (2 cr alt yrs, prereq Anat 5-103 and 5-104 or 5-105 or #) Redman  
Comparative morphology and functions of salivary glands of man and laboratory animals. Synthesis and secretion of salivary proteins. Analysis of relationships of salivary constituents to glandular components and variations in secretory stimulation. Effects of salivary constituents on oral environment.
- OBio ----. BIOLOGY OF MINERALIZED AND OTHER CONNECTIVE TISSUES. ( cr alt yrs) Smith  
Lectures and discussions on developmental biology of connective tissues, the morphologic and biochemical composition of connective tissue components, structure and biosynthesis of connective tissue components, normal and pathologic mineralization and changes in connective tissue during aging, wound healing and various disease processes.
- OBio ----. BIOLOGY AND MICROBIOLOGY OF MUCOUS MEMBRANES
- OBio ----. DENTAL AND MAXILLOFACIAL BIOMATERIALS
- Dent 5-750. OCCLUSION I. (2 cr; 10 lect and 20 lab) Butler and Staff  
on an interdisciplinary basis  
Principles of occlusion with consideration of the history of occlusion, anatomy of the masticatory system, articulators and articulation of models, and occlusal analysis.
- Dent 5-751. OCCLUSION II. (1 cr; 10 lect hrs) Butler  
Principles of occlusion with emphasis on neurology and physiology of occlusion, muscle physiology, mandibular movement and concepts or philosophies of occlusion.
- Dent 5-752. OCCLUSION III. (1 cr; 10 lect hrs) Butler  
Principles of occlusion especially concerned with the pathology of occlusion bruxism, traumatic occlusion and occlusal trauma, temporomandibular joint dysfunction syndrome, occlusal adjustment and the examination, diagnosis and treatment planning of such patients.
- Dent 8-126. TEACHING AND EVALUATION IN DENTISTRY I. (3 cr) Loupe and Proshek  
Psychology of learning and instruction. Emphasis on applications of educational and psychological principles of learning to higher education and in particular to professional dental training. Theoretical principles of behavioral psychology and cognitive psychology will be stressed where they apply to such topics as motivation, memory, transfer, and learning. While it is not the purpose of this course to explore theoretical positions in depth, some of their more basic philosophical roots will be traced.

- Dent 8-127. TEACHING AND EVALUATION IN DENTISTRY II. Loupe and Proshek  
Measurement and evaluation. Emphasis on the application of evaluation and measurement theory to higher education and more specifically dental education. The basic topics to be covered involve objectives for teaching and evaluation, construction of measurement instruments and tests, the analysis of tests, and the interpretation of test results.
- Opat 8-300. HUMAN DEVELOPMENT GENETICS I. (2 cr) Witkop and Umana  
Genetic and genetic-environmental interactions in the development of normal and abnormal human traits. Genetic control of pre- and postnatal differentiation at the cellular tissue level. Morphological and functional (behavioral) human traits especially those affecting the face and oral structures, will be emphasized.
- Opat 8-301. HUMAN DEVELOPMENT GENETICS II. CONTINUATION OF OPAT 8-300. (2 cr; prereq Opat 8-300) Witkop and Umana
- Opat 8-009. EMBRYOLOGY OF THE HEAD AND NECK. (1 cr)  
Primitive germ layers, ectodermal placodes, stomodeum. Oral cavity, Rathke's pouch, hypophysis, nose, jaws, chondrocranium, tongue, thyroid, pharyngeal arches and pouches, parathyroid, thymus will be discussed.
- Opat 8-002/8-003. ORAL PATHOLOGY. (4 cr) Gorlin and Vickers  
Lectures and laboratory on histology of teeth and related oral tissues, including embryologic considerations. Special pathology of the oral regions as well as relation of local pathologic findings to systemic conditions and to general pathology. Graduate students participate as laboratory assistants and meet some further requirements.
- Opat 8-005. ADVANCED ORAL PATHOLOGY. (1-3 cr; limited to 8 students)  
Gorlin, Shapiro and Vickers  
Salivary gland development and pathology; dental organ pathology; bone physiology and pathology; radiation pathology; dermatology; lymph node and/or reticuloendothelial pathology; soft tissue pathology pertaining to the head and neck.
- Otho 8-200, 8-201, 8-202, 8-203. GROWTH AND DEVELOPMENT. (cr and hrs ar)  
Head growth, development, osteology and myology. Includes both normal and abnormal morphology and function with emphasis on cephalometric methods.
- Pero 8-250. SUPPORTING STRUCTURES OF THE TEETH. (3 cr)  
Histology, pathology, and physiology of the gingival tissues, the cementum, the periodontal membrane, and the alveolar bone discussed in lectures. Associated problems studied on a set of microscopic slides.
- PubH 5-450. BIOMETRY I. (3 cr; prereq Math 10 or # and #PubH 5-451) Bartsch  
Basic concepts in probability; binomial, Poisson, and normal probability models; testing hypotheses and estimation of parameters of probability models.
- PubH 5-451. BIOMETRY LABORATORY I. (2 cr; #PubH 5-450) Bartsch  
Application of concepts of probability to the development of probability models for random phenomena in the biological and medical sciences.
- PubH 5-452. BIOMETRY II. (3 cr; prereq PubH 5-450, 5-451, #5-453) Bartsch  
Further consideration of testing statistical hypothesis and interval estimation; regression analysis; correlation; use of ratios; analysis of variance; contrasts and multiple comparison techniques.

- PubH 5-453. BIOMETRY LABORATORY II. 92 cr; (5-452) Bartsch  
Application of concepts of testing and estimation concerning the parameters of the basic probability models; application of regression to bioassay; examples of the use and misuse of ratios; application of analysis of variance to bioassay.
- PubH 5-454. BIOMETRY III. (3 cr; prereq PubH 5-452, 5-453, (5-455) Bartsch  
Analysis of randomized block, factorial and split plot design;  $\chi^2$  applied to frequency data.
- PubH 5-455. BIOMETRY LABORATORY III. (2 cr; (PubH 5-454) Bartsch  
Basic design will be illustrated with numerous examples from the biological sciences: application of  $\chi^2$  to goodness of fit and heterogeneity tests.
- Anth 5-631. HUMAN PHYSICAL GROWTH AND DEVELOPMENT. (3 cr; prereq 1A or 101...  
waived for majors in child development) Murrill  
Period of growth - prenatal, birth infancy, childhood, and adolescence. Sex differences in growth, skeletal maturation. Development and growth of the head. Growth and eruption of teeth.
- SSPA 5-507. CLEFT PALATE. (2 cr; prereq 120, 143) Starr  
Survey of medical, dental, and communication problems that occur in conjunction with cleft palate.
- Biol 5-061. DEVELOPMENTAL BIOLOGY. (3 cr prereq 70) Spratt, McLaughlin  
Developing systems and control mechanisms of development, from molecule to organism.
- Biol 5-601. GENERAL CYTOLOGY. (3 cr, GCB 51, 120; prereq 10 cr in biology, botany, zoology, elementary genetics or #) Johnson, Cunningham  
Introductory analysis of structure, growth and function of cells and organelles.
- Biol 5-605. GENERAL CYTOLOGY LABORATORY. (2 cr; limited to 10 students, prereq 131 or (131 or #) Johnson, Cunningham  
Experimental approach to cell structure and function including specialized forms of light microscopy, autoradiography, cell fractionation and an introduction to electron microscopy.

e. Minor or supporting fields. In order to complement and support the major interests of the candidate work will be taken in one or a combination of traditional basic medical sciences (for example microbiology, physiology, anatomy), in other University departments (for example anthropology, psychology, speech) or in one of the graduate dental programs. Credit for work done in one of the graduate dental programs cannot include repetitive (no matter how complex) clinical procedures.

f. Language requirement. Language requirement for M.S. and Ph.D. candidates will be decided individually for each candidate in consultation among the student, his advisor and the director of graduate studies. The need for language proficiency, the level of such proficiency and the choice of language(s) will depend on the area in which the student expects to concentrate his efforts.

g. The M.S. degree. A student may with the agreement of his advisor and the graduate faculty pursue one of two M.S. plans.

Plan A: Plan A Master's requires a minimum of 18 credits in the major and 9 in the minor or supporting field. A thesis representing original research is required.

Plan B: Plan B Master's requires a minimum of 45 credits, at least 21 of which must be in the major. Three papers representing the quality but not the original research of the Plan A thesis must be prepared in three advanced courses or seminars. These papers must involve independent work under faculty supervision and involve 9 credits.

Examinations: following completion of major and minor course work the Master's candidate will be required to pass a written examination prior to admission to his final oral examination. This examination will be the same as part I of the Ph.D. written preliminary examination. Following completion of the thesis (Plan A) or three papers (Plan B) a final oral examination will cover both major and minor fields and examine the Plan A thesis or Plan B papers.

h. The Ph.D. degree. Preliminary examinations: Evaluation of readiness to undertake the research and dissertation for the Ph.D. will include a written and an oral preliminary examination. Admission to these examinations will be by mutual agreement of the student, his advisor and the director of the graduate program.

Written examination: The written examination must be successfully completed by the end of the second academic year in the program. It will consist of two parts. In part I the student must provide evidence of his understanding of the basic problems of oral biology. He will be required to demonstrate knowledge in breadth concerning major areas of and fundamental to problems of oral biology (e.g. calcified tissues; salivary glands and saliva; supporting tissues of the teeth; craniofacial growth and development). In part II the student will be required to demonstrate an in-depth understanding of one or more of these areas by preparation of two research proposals. In each proposal the student will: (i) State a major problem in oral biology; (ii) pose a specific question that can be answered with current methodology and when answered, will be relevant to the stated problem; (iii) provide a detailed experimental design to provide an answer to the specific question, (iv) project possible results generated by the experimental design and state the probable significance of these results and (v) in light of the hypothetical results, propose further steps toward solution of the initial major question.

Oral preliminary examination: Upon satisfactory completion of the written examination, the student is eligible for the oral examination. This examination shall cover major and minor (or supporting fields) and any work basic to these fields. However, the major emphasis will be defense of both of the proposals submitted as a portion of the written examination. The student will be thoroughly examined on basic material related to his research proposals as well as the proposals themselves.

Ph.D. thesis: One of the proposals presented for the preliminary examination may form the basis for a dissertation. The thesis shall demonstrate the student's ability to: ask an original question in the field of oral biology; design methods for answering the question; carry out independent investigation; prepare a manuscript which reflects a thorough understanding of the appropriate literature and reports methods, results and their interpretation with a reasonable degree of literary skill; and recognize the significance for oral biology of the question the design and results.

i. Model Ph.D. programs

## Model Ph.D. Program No. 1

Background: B.S., D.D.S., 3 years in Military Service (Dental Corps)

Special Interest: Salivary Gland Growth and Development

Major: Oral Biology

OBio 8-010, -011	Principles of Oral Biology I and II	6 cr
OBio 8----	Tutorial in Oral Biology	6 cr
OBio 8----	Biology of Mineralized and Other Connective Tissues	3 cr
OBio 8----	Salivary Glands and Their Secretions	2 cr
OBio 8-030	Seminar	3 cr
OBio 8----	Developmental Biology of Salivary Glands	2 cr
OBio 8----	Topics (Aging)	2 cr
OBio 8----	Topics (Plaque and Calculus)	2 cr
PubH 5-450,	2 Biometry I and II	6 cr
PubH 5-451,	3 Biometry Laboratories I and II	4 cr
OPat 8-005	Advanced Oral Pathology	2 cr
OPat 8-300,	1 Human Developmental Genetics I and II	4 cr
Dent 8-126,	7 Teaching and Evaluation in Dentistry	6 cr
	<b>Total Major</b>	<b>49 cr</b>

Supporting Field: Cell Biology

Anat 8-137	Biological Electron Microscopy: Interpretation	2 cr
Anat 8-168	Cytologic Aspects of Protein Biosynthesis	3 cr
Biol 5-061	Developmental Biology	3 cr
GCB 5-052	Quantitative Techniques, Cell Biology	3 cr
MdBc 5-741,	2, 3 Biochemistry	9 cr
MdBc 5-750	Biochemistry Laboratory	4 cr
	<b>Total Supporting Field</b>	<b>24 cr</b>

## Model Ph.D. Program No. 2

Special Interests: Biochemical Study of the Development of Supporting Structures of the Teeth

Major: Oral Biology

OBio 8-010	Principles of Oral Biology I	3 cr
OBio 8-011	Principles of Oral Biology II	3 cr
OBio 8----	Tutorial in Oral Biology	6 cr
OBio 8----	Biology of Mineralized and Other Connective Tissues	3 cr
OBio 8----	Salivary Glands and Their Secretions	2 cr
OBio 8-030	Seminar	3 cr
OBio 8-021	Topics - Plaque - Calculus	2 cr
OBio 8-022	Topics - Inflammation and Repair	2 cr
OBio 8-023	Topics - Periodontium	2 cr
PubH 5-440	Biometry I	3 cr
PubH 5-451	Biometry Laboratory I	2 cr
PubH 5-452	Biometry II	3 cr
PubH 5-453	Biometry Laboratory II	2 cr
Dent 8-126	Teaching and Evaluation in Dentistry I	3 cr
Dent 8-127	Teaching and Evaluation in Dentistry II	3 cr
Biol 5-061	Developmental Biology	3 cr
	<b>Total Major</b>	<b>45 cr</b>

Minor: Biochemistry

MdBc 5-741,	2, 3 Biochemistry	9 cr
MdBc 5-750	Biochemistry Laboratory	4 cr
MdBc 8-219	Biochemistry of Specialized Tissues	3 cr
MdBc 8-220	Carbohydrates	3 cr
MdBc 8-206	Advanced Endocrinology and Steroid Chemistry	3 cr
MdBc 8-211	Nucleic Acid Structure and Function	3 cr
	<b>Total Minor</b>	<b>25 cr</b>

## Model Ph.D. Program No. 3

Special Interests: Craniofacial Growth and Development

Major: Oral Biology

OBio 8-010	Principles of Oral Biology I	3 cr
OBio 8-011	Principles of Oral Biology II	3 cr
OBio 8----	Biology of Mineralized and Other Connective Tissues	3 cr
OBio 8----	Developmental Biology of Salivary Glands	2 cr
OBio 8----	Salivary Glands and Their Secretions	2 cr
OBio 8-030	Seminar	3 cr
OBio 8----	Tutorial in Oral Biology	6 cr
OPat 8-300	Human Developmental Genetics I	2 cr
OPat 8-300	Human Developmental Genetics II	2 cr
Anthro 5-631	Human Physical Growth and Development	3 cr
Speech 5-507	Cleft Palate	2 cr
PubH 5-450, 2, 4	Biometry I, II, III	9 cr
PubH 5-451, 3, 5	Biometry Laboratory I, II, III	6 cr
Dent 8-126, 7	Teaching and Evaluation in Dentistry I and II	6 cr
	<b>Total Major</b>	<b>52 cr</b>

Supporting Field: Human Developmental Biology

Biol 5-061	Developmental Biology	3 cr
Biol 5-065	Laboratory in Developmental Biology	2 cr
GCB 5-052	Quantitative Techniques, Cell Biology	3 cr
Anat 5-106, 7	Human Embryology	4 cr
MdBc 5-100	Biochemistry	6 cr
MdBc 5-101	Biochemistry	4 cr
	<b>Total Supporting Field</b>	<b>22 cr</b>

## Model Ph.D. Program No. 4

Special Interests: Epidemiology of Occlusion

Major: Oral Biology

OBio 8-010	Principles of Oral Biology I	3 cr
OBio 8-011	Principles of Oral Biology II	3 cr
OBio 8----	Tutorial in Oral Biology	6 cr
OPat 8-300	Human Developmental Genetics I	2 cr
OPat 8-301	Human Developmental Genetics II	2 cr
Anthro 5-631	Human Physical Growth and Development	3 cr
PubH 5-450, 2, 4	Biometry I, II, III	9 cr
PubH 5-451, 3, 5	Biometry Laboratory I, II, III	6 cr
Dent 8-126, 7	Teaching and Evaluation in Dentistry I, II	6 cr
5-106, 107	Human Embryology	4 cr
Dent 8-400, 401	Occlusion	4 cr
Pero 8-250	Supporting Structures of the Teeth	3 cr
Otho 8-200, 201, 203	Growth and Development	8 cr
	<b>Total Major</b>	<b>53 cr</b>

Minor: Epidemiology

PubH 5-330	Epidemiology I	3 cr
PubH 5-335	Epidemiology II	3 cr
PubH 5-379	Topics in Epidemiology	3 cr
PubH 5-340	Epidemiologic Survey Methods	3 cr
PubH 8-379	Seminar: Epidemiology	2 cr
PubH 8-340	Epidemiology of Noncommunicable Diseases	3 cr
PubH 5-412	Survey Sampling in Social and Health Science Research	3 cr
PubH 5-460	Demography and Health	3 cr
	<b>Total Minor</b>	<b>23 cr</b>

Model M.S. (Plan B) Program

Special Interests: Dental Specialty Teaching

Major: Oral Biology

OBio 8-010, 8-011 Principles of Oral Biology I and II	6 cr
OBio 8---- Biology of Mineralized and Other Connective Tissues	3 cr
OBio 8-030 Seminar	3 cr
OBio 8---- Tutorial in Oral Biology	6 cr
Dent 8-126, 8-127 Teaching and Evaluation in Dentistry I and II	6 cr
OPat 8-002, 8-003 Oral Pathology	4 cr
Total Major	28 cr

Supporting Fields: Speech Pathology and Biometry

PubH 5-450, 5-452 Biometry I and II	6 cr
PubH 5-451, 5-453 Biometry Laboratory I and II	4 cr
SSPA 5-507 Cleft Palate	2 cr
SSPA 5-302 Anatomy and Physiology of the Speech and Hearing Mechanisms	3 cr
SSPA 8-507 Seminar: Cleft Palate	3 cr
Total Supporting Field	18 cr

Model M.S. (Plan A) Program

Concurrent Program: Qualification for Certification by American Board of Pedodontics. (Courses taken for enhancement of clinical skills pursuant to the specialty of Pedodontics are not included in the Oral Biology program).

Special Interests: Caries Prevention in Children

Major: Oral Biology

OBio 8-010, 011 Principles of Oral Biology I and II	6 cr
OBio 8---- Biology of Mineralized and Other Connective Tissues	3 cr
OBio 8---- Salivary Glands and Their Secretions	2 cr
OBio 8-030 Seminar	3 cr
PubH 5-450, 2, 4 Biometry I and II	6 cr
PubH 5-451, 3 Biometry Laboratory I and II	4 cr
Dent 8-126, 7 Teaching and Evaluation in Dentistry I and II	6 cr
OBio 8---- Tutorial in Oral Biology	4 cr
Total Major	34 cr

Minor: Biochemistry

MdBc 5-100, 1 Biochemistry	10 cr
MdBc 5-750 Biochemistry Laboratory	4 cr
MdBc 5-053 Problems in Biochemistry	6 cr
Total Minor	20 cr

Thesis title: The Effects of Topically Applied Acidulated Fluorophosphate Solutions and Cyanoacrylic Sealers on Caries Activity in Weanling Rats.

4. Number of type of students to be served

Probably no more than 3 students will embark on the doctoral program initially. An estimate of about 15 to 20 students may be enrolled in the program after 5 years. (This would to a great extent depend on available funds for supporting these students - see #11).

5. Relationship to other programs

There are no programs comparable to the proposed program offered at this University or elsewhere in the state. There are no apparent

conflicts with existing programs. In fact, courses that will be offered would seem to fill a void existing in the Health Sciences Center and in the College of Biological Sciences. For example, to our knowledge there is no course in which problems in general of calcified tissues are considered: their morphology, biochemistry, development and pathology. It would seem that a course such as this would be useful to many dental specialists, individuals in other basic sciences, and to orthopedic surgeons. A second example is a proposed course in biology and microbiology of mucous membranes. A course such as this would seem to be appropriate for individuals training in obstetrics and gynecology in otolaryngology and in dermatology as well as in some dental specialties.

#### 6. Department and individual staff involved in the program

The major criteria for the inclusion of faculty as full members on the Oral Biology Graduate faculty are: (1) a manifested interest in Oral Biology, (2) the expectation of continued interest and participation in the graduate program, (3) demonstrated ability through training and publications of high quality research in oral biology and (4) evidence of potential ability and willingness to advise doctoral candidates. Each of the individual staff members to be involved initially in the program holds an appointment in the Department of Dentistry. In addition most are members of graduate faculty in other programs at the University.

Because the nature of oral biology is one of integration of existing areas of knowledge in order to focus on the special problems of oral tissues no research techniques are unique to this field. Similarly, because of its nature no research technique is excluded from potential application to oral biological questions. Accordingly in an individual case a graduate student may seek to work in a laboratory of a graduate faculty member not specifically on the oral biology graduate faculty. It is expected that in individual cases arrangements can be made for such associations. In addition because their research and teaching interest have been closely allied with problems of Oral Biology individuals in other departments will be involved in the presentation of courses and may be asked to join the graduate faculty.

There follows the individuals who would form the initial core for operation of the program. It is proposed that these individuals be appointed as full (B) members of the graduate faculty in Oral Biology. Their curricula vitae are attached (Appendix 3).

Armstrong, Wallace, D., M.D., Sc.M. (Organic Chemistry), Ph.D. (Physiological Chemistry), Professor and Head, Department of Biochemistry, B (Biochemistry), A3 (Dentistry).

Gorlin, Robert J., D.D.S., M.S. (Chemistry), Professor and Chairman, Division of Oral Pathology, A3 (Dentistry).

Isaacson, Robert J., D.D.S., M.S.D. (Orthodontics), Ph.D. (Anatomy), Professor and Chairman, Division of Orthodontics, A3 (Dentistry), B (Anatomy).

Meskin, Lawrence H., D.D.S., M.S.D. (Oral Pathology), M.P.H., Ph.D. (Epidemiology), Professor and Chairman, Division of Health Ecology, A3 (Dentistry), B (Epidemiology).



Redman, Robert S., D.D.S., M.S.D. (Oral Pathology), Ph.D. (Experimental Pathology), Associate Professor, Division of Oral Biology, A3 (Dentistry).

Shapiro, Burton L., D.D.S., M.S.D. (Oral Pathology), Ph.D. (Genetics), Professor and Chairman, Division of Oral Biology, A3 (Dentistry), A3 (Genetics).

Smith, Quenton T., M.S. (Biochemistry), Ph.D. (Physiological Chemistry), Associate Professor, Division of Oral Biology, Associate Professor, Biochemistry, A3 (Dentistry), A3 (Biochemistry).

Witkop, Carl J., D.D.S., M.S. (Oral Pathology), Professor and Director, Program of Human and Oral Genetics, A3 (Dentistry), B (Genetics).

#### 7. Equipment for the program

Existing equipment in laboratories of potential advisors are sufficient for initiation of the program. Specific equipment needs of a candidate would depend on his research interests. These in turn would involve specific faculty who in general possess equipment in their own areas.

#### 8. Space requirement

Laboratory facilities now used by proposed graduate faculty in Oral Biology will be adequate for the first few years of the program. By the beginning of the third year of the program (assuming approval of this proposal for September 1971) construction of building A of the Health Sciences Center should be completed. These facilities will be adequate for the anticipated growth of the proposed graduate program.

#### 9. Library facilities

Library facilities in the Diehl Hall Library are excellent for the purposes of this program. In addition departmental libraries may be used depending on the specific interests of a candidate.

#### 10. Estimated costs

There should be no major costs for establishing this program. It can be initiated with existing faculty, space and equipment. Minor costs would consist of printing and mailing costs for distributing brochures, providing information about the program and for guest lecturers when appropriate. Funds for these items will be available.

#### 11. Sources of additional funds

The School of Dentistry has been approached by the NIDR concerning their interest in supporting a training center in Oral Biology at Minnesota. A training center of this type would provide stipends for graduate students and additional funds to support their research training. If funded these stipends would be available to candidates in traditional Ph.D. programs as well as to Oral Biology majors.

## 12. Evidence of disucssion of new program

This proposal has been circulated widely to faculty in the School of Dentistry. Individuals listed in the proposed graduate faculty reviewed and suggested changes incorporated into this draft. They expressed their endorsement by agreeing to serve on the faculty. In addition an announcement was made at a School of Dentistry faculty meeting inviting all other interested faculty to review the program. Those individuals who reviewed the draft responded favorably especially in terms of training individuals who eventually could contribute to training of graduate students in some specialty areas.

The administration of the School supports and endorses the proposed program.

Two faculty members, each of whom has a Ph.D. in a basic science, do not, at this time, feel that they can support such a program. They question whether there is a sufficient body of knowledge concerning oral tissues or functions or in the model programs to warrant a Ph.D. They believe that graduate education is training in specific skills and that students in an Oral Biology program could not possibly acquire research skills. They question, in general, the philosophy of interdisciplinary didactic work in graduate education. Success of the program does not depend on active support of these individuals as potential advisors. There is no question of their cooperation in terms of lecturing or providing assistance with laboratory procedures if such needs arise.

Each member of the Dental Subcommittee of the Health Sciences Group Committee has read and supports the proposed program in Oral Biology.

## 13. Proposed date for implementation:

The earliest approval of this program would enhance the ability to respond to NIDR concerning the proposed training center. A proposed date of implementation of the program would be September 1, 1971.

## Appendix 1 - Graduate Programs in Oral Biology in other Institutions

University of Pennsylvania  
 University of Michigan  
 University of California, San Francisco  
 University of Alabama  
 University of Washington  
 State University of New York at Buffalo  
 Harvard University  
 University of Manitoba  
 University of North Carolina  
 University of Alberta

## Appendix 2 - Extent of Oral Disease

"Oral and dental diseases are the most universal affliction of mankind. Although they lack the spectacular drama of killer diseases, they greatly affect the physical, mental and social well-being of millions of Americans and impose a tremendous economic burden"\*. Reports in the Survey of Dentistry and in a recently published survey by the United States Public Health Service reveal the following statistics on the oral health problems in the American population:

### Dental caries

One hundred and ninety million people are currently afflicted with carious lesions.

In the year 1960 there were 700 million untreated dental cavities.

Among the 10 percent of children under five years of age who visit the dentist, only one of three is free of untreated carious lesions; one out of 10 has eight or more cavities.

Adults had an average of 20.4 decayed, missing or filled teeth per person.

### Periodontal diseases

Twenty-eight million people have advanced periodontal disease.

Diseases of supporting bones and gingival tissues affected at least half of the population by the age of 50 and almost everyone by age 65.

### Edentulousness

Twenty million people are edentulous. (One in nine).

One in four adults had no natural teeth remaining in either one or both jaws and nearly one in two had lost all teeth by 65-74 years.

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\*U.S. Public Health Service, July 1967, The Advancement of Knowledge for the Nation's Health - A Report to the President on the Research Programs of the National Institutes of Health.

### Malocclusion and facial clefts

One child out of five needs orthodontic treatment for afflictions ranging from faulty alignment of teeth to severe facial deformity.

Not fewer than one-fifth and perhaps as many as one-half of the school age population have, or will develop, malocclusions severe enough to require orthodontic treatment.

One out of every six hundred and fifty babies is born with a cleft lip or palate or both. The latter make up approximately 13% of all birth anomalies and are the second most common defect at birth.

### Oral cancer

One of every forty cancer deaths - five thousand per year - is from oral cancer.

Nearly 5 percent of all malignant lesions in the U.S. are oral. In some areas of the world oral malignancies account for up to 40% of the total.

The preceding statistics indicate that present levels of treatment, research and education fall far short of the existing and projected needs.

PROGRAM REVIEW WORK SHEETS FOR THE FORMAL PROPOSALS  
TO THE CURRICULUM ADVISORY COMMITTEE OF THE  
MINNESOTA HIGHER EDUCATION COORDINATING COMMISSION

Title of Proposal

M.S. in Medical Microbiology

Submitting Institution

Mayo Graduate School of Medicine  
(Univ. Minn.) Rochester

Type of Institution

Graduate School

Governor's Planning Area

Inter-Institutional Planning

Mayo Graduate School of Medicine  
(Dept. Microbiology & Immunology) and  
University of Minnesota (Dept. Micro-  
biology and Dept. Laboratory Medicine.

Similar existing or proposed programs in  
the state, by location, planning area  
and type of institution

None; new program

1. Tentative approval of the institution's governing board.  
Yes. Division of Education
2. Need for the program  
pp. 1-2, Appendix 1. Shortage of allied health manpower. Am. Acad. Microbiol. Specialist Program
3. Firm supporting data to establish this need  
p. 1 Health Manpower Commission of 1967 estimate of need.
4. Program objectives  
p. 2 Graduate training in medical microbiology leading to M.S. and Specialist certification
5. Content of the program  
pp. 2-4, Appendices 2-4 (pp 11-20) narrative, model curriculum
6. Number and type of students to be served  
pp. 4-5. 5 first year, 10 in subsequent years. B.S. required ~~4~~ 30 CH in biology; RT, MT with B.S. M.D., Ph.D. requiring MS and Specialty certification.
7. Number and type of students to be served five years after the inception of the program  
Any increase dependent upon size of anticipated new laboratories.
8. Relationship of the proposed program to existing programs at the offering institution. Shares some courses with existing graduate program in microbiology & immunology. Utilizes existing courses in statistics

9. Relationship of the proposed program to any other similar programs offered in the state in both public and private institutions  
None except similar proposed program of U. Minn. see p.7 for background.
10. Additional faculty members needed during the first year of operation.  
None, but will require effort of ca 1.3 FTE of existing faculty.
11. Additional faculty members needed five years after its inception  
Not known.
12. Equipment which will be needed to initiate the program.  
5 binocular microscopes. Possible increase in incubator space.
13. Equipment needed during the five year period after its inception.  
Not known - depends on space and number of students.
14. The indication of any additional laboratory facilities needed to initiate the program.  
None
15. The indication of any additional laboratory facilities needed during the five-year period after its inception.  
None
16. A specific indication that existing library holdings and the current level of support will be sufficient to establish and maintain the new program or an estimate of the additional cost of obtaining sufficient library holdings to initiate the program.  
Mayo Library and Departmental Library sufficient for needs.
17. Total estimated costs for establishing the program initially.  
Costs will be for 1.3 FTE Faculty, 2 FTE technicians, stipends for students, etc - Total cost not yet established. To be borne by Mayo Foundation.
18. Total estimated costs for establishing the program initially and on a five-year basis.  
Not known
19. Suggested sources for any additional funds required to establish the new program.  
Mayo Foundation; Dept. Labor - Allied Health Manpower; DHEW/USPHS/NIH
20. The Curriculum Advisory Committee has considered all pertinent factors and recommends ( ), does not recommend ( ) this program to Planning Committee A

P R O P O S A L

FOR A

M.S. IN MEDICAL MICROBIOLOGY

DIVISION OF EDUCATION  
MAYO FOUNDATION

February, 1971

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PROPOSAL FOR DEVELOPMENT OF  
NEW GRADUATE DEGREE PROGRAM IN MEDICAL MICROBIOLOGY

Introduction. Need for new program and relationship to existing programs. While physicians fill a central role in the delivery of health care, a rapidly developing technology in this field has increased the demand for allied health personnel, such as medical technologists, microbiologists, and chemists. The 1967 Health Manpower Commission has reported that, although the number of allied health professionals has increased considerably in the past 25 years, the demand has outstripped the supply. Increasing population, medical specialization, and technological advances are estimated to increase requirements for additional physician-directed laboratory services by at least 50% in the interval of 1965 to 1975. The Social Security Amendment of 1965 requires that certification programs be implemented to qualify laboratory participation in Medicare. As a result, there is increasing demand for well-trained and certified or licensed personnel in clinical laboratories.

To meet this manpower crisis, not only do present undergraduate curricula in such areas as medical technology and microbiology need to be improved and expanded, but also postgraduate training programs need to be developed to enhance the skills of laboratory workers and provide them with duly recognized programs leading to certification and licensure.

The National Registry of Microbiologists is a committee of the American Academy of Microbiology and subject to the Board of Governors thereof. Prerequisites for application to the Specialist Program are listed on page 6 of the National Registry enclosure (Appendix 1). As noted in the enclosure, a master's degree in microbiology is one of the prerequisites. Although there are a number of universities offering master's degrees in microbiology,

most of these institutions encourage pursuit of the doctoral degree, and only a few (Baylor, Columbia, Washington and Temple, as rare examples) offer any programs oriented to Medical (or Clinical) Microbiology at all. There is no comparable program in this state or region of the country. It is our opinion that the current and anticipated manpower shortages in the area of Medical Microbiology provide justification for development of a master's degree program in this field. Candidates fulfilling the Registry's requirements for the Specialist category will presumably be given prime consideration for supervisory roles in medical microbiology laboratories.

Objectives: The primary objective is to develop a graduate training program at the master's level in the area designated Medical Microbiology. More specifically, the purpose is to train post-baccalaureate students interested in medical microbiology, in advanced concepts and methodologies in medical bacteriology, virology, mycology, parasitology, and immunology. Special emphasis will be placed on laboratory methods relevant to these areas. The program will be oriented to prepare medical microbiologists for supervisory and administrative roles in diagnostic microbiology laboratories.

Content: The basic program will consist of course work in medical microbiology and immunology, biochemistry and biostatistics plus additional electives and "internship" or "preceptorship" and research and experience at the Mayo Clinic in the Department of Microbiology and Immunology. Course outlines are appended (Appendices 2 and 3) with names of responsible staff members.

One-hour weekly seminars in Parasitology are now conducted by John H. Thompson, Jr., Ph.D. on a quarterly basis and will be required of degree candidates.

Courses for a minor are already available in Biostatistics, Biochemistry, or Physiology through the Mayo Graduate School in Rochester as listed in the University of Minnesota Bulletin.

Although not currently accredited by the University of Minnesota, programming classes are offered by our Computer Facility on a quarterly basis. For students electing Plan A course of study we propose that computer language be accepted as a desirable alternative to the language requirement. Computer programming is consonant with the needs of a laboratory supervisor and clearly meets the reality of this program's objectives. Demonstration of ability to write a computer program for a laboratory function would satisfy this requirement. Each class meets daily for five hours over a two-week period, and course titles are as follows: (1) Basic Fortran, (2) Basic Compass, (3) Intermediate Fortran, and (4) Intermediate Compass. In view of the increasing orientation of clinical laboratory towards computerized data processing, it is recommended that candidates take these courses.

Beginning with the summer quarter a preceptorship and internship in the laboratory areas will be given. A suggested course outline is appended (Appendix 4) which includes the distribution of time during the preceptorship and internship. Upon completion of the preceptorship the student would be eligible to carry out his thesis (Plan A) or project (Plan B). It was decided to provide the thesis option in this program, whereby a degree candidate could choose to carry out a project in Medical Microbiology, subject to approval and review of a protocol by the Curriculum Committee. Such a project should be planned so as to permit logical conclusion within the normal schedule for the program and so as to result in a paper for presentation at a national meeting and publication in a journal. Selection of the project's title would be in consultation with a member of the staff in whose laboratory the work would be carried out. Its appropriateness would have to be approved by the Curriculum Committee. Under Plan A, theses would be encouraged in methods-development, taxonomy, clinical correlation or microbiological data analysis.

Application: Prerequisites include a major or minor in microbiology, biology, or medical technology with an acceptable background in biology, microbiology, chemistry and at least 30 semester hours in biological sciences. Since the University's Master's Degree program assumes no prior experience in Microbiology, it is believed that the first year's experience in this program will satisfy those courses included in the National Registry's prerequisites for examination. It is expected that some microbiology technicians with bachelor degrees might be acceptable in this program even though they well might not have the prerequisites. These candidates will be judged on their merit and evidence of promise and consideration will be given to admitting them on probationary status.

Number and type of students: It is anticipated that students admitted to this program would have baccalaureate degrees in microbiology, biology, or medical technology with or without actual laboratory experience in medical microbiology. Prior course work in microbiology or experience in Medical Microbiology may, subject to approval of the Curriculum Committee, obviate necessity of attendance or participation (but not of examination) in certain portions of the course work or internship. For example, a medical technologist with a year or more of satisfactory experience in a medical bacteriology laboratory could, with approval of the Curriculum Committee, skip the eight weeks of Bacteriology internship to spend that time on the project or thesis or to spend additional time in another area of medical microbiology.

In addition to the real advantages this program offers the medical technician who wishes an advanced degree in medical microbiology and specialization and certification in this field, it may offer similar advantages to physicians completing training in laboratory medicine or clinical pathology who can utilize it for their subspecialty boards under the American Board of Pathology requirements.

There is a possibility that this program might be attractive to physicians who are not pathologists. While each situation will be judged on its merits, we would prefer to have these M.D.'s in our postdoctoral training program which would satisfy the American Society for Microbiology requirements for residency and admit them to examination by the American Board of Microbiology.

It is anticipated that initially five students could be accepted yearly in the Mayo Medical Microbiology program and that this number could be increased when additional laboratory space is available.

Examinations: Candidates for the Master's Degree in Medical Microbiology will satisfy the requirements for each course as determined by the department (University of Minnesota or Mayo Clinic) giving it. A final oral and written examination will be given as admission to the examination by the American Society for Microbiology Registry. Successful candidates would then be expected to become certified by taking the American Society for Microbiology specialist's examination.

Departments and Faculty: The members of the Department of Microbiology and Immunology of the Mayo Graduate School of Medicine, plus one member of the Department of Clinical Pathology (Dr. Thompson) (curriculum vitae of each in appendix) comprise the faculty for the Mayo Graduate School of Medicine portion of the program. The appropriate members of the University of Minnesota medical campus departments will be determined by Dr. Watson for their respective departmental courses relevant to the program. An Admission's Committee will be established with members from the Mayo Graduate School of Medicine and the Department of Microbiology and Immunology. These same individuals should comprise a Curriculum Committee in Medical Microbiology to assist in planning the curriculum for each student and in periodically grading the progress of degree candidates in this area.

Resources: Existing departmental and Mayo Clinic Library holdings of at least 150,000 titles should be adequate to supply students with needed reading materials. Existing laboratories and capital equipment except for five additional microscopes are available for the anticipated ten students in residence in the second year of the program.

Inquiries have been made by Dr. Hal Riehle of the Division of Instructional Media at the Mayo Clinic concerning the feasibility of having certain courses at the University video taped for purchase by the Mayo Graduate School. This arrangement would provide our students with the obvious advantage of not having to travel to the Minneapolis campus on a daily basis or to be housed fulltime in Minneapolis for the one quarter involved. If this were to be the case all course work (e.g. bacteriology, physiology, biochemistry) for that quarter would be performed at the Medical School Campus. Dr. Watson has approved this. Intermittent live contact could be established by having the students go to the University once or twice weekly. An estimate of such a service in 1967 yielded costs of about \$25.00 monthly and \$1500 in non-recurring expenses, although there is a possibility that this service might be obtained at no charge. A playback machine and monitor at the Mayo Campus would cost about \$2000. The University's audiovisual facilities are capable of taping classes either in the classroom or in their studios, the former probably representing the more practical approach. Further delineation of this subject will be pursued by Dr. Riehle if the M.S. program is approved.

Costs: It is not possible to anticipate the costs to implement and maintain this program since some of the functions and activities are or will be utilized by other graduate students or fellows. It might be anticipated that exclusive of these projects for those electing this

option and preceptorships about 0.8 FTE faculty members p.a. and 1.0 FTE technical personnel p.a. will be required. The preceptorships will likely require about 0.5 FTE faculty and an additional 1.0 FTE technician time distributed in several laboratories.

Funding: With acceptance of this program by the University, an application will be made for extramural funds for the support of these degree candidates. A proposed extramural award to the American Society for Microbiology who would distribute funds for programs of this kind is said to be in the planning stage. In addition, the Mayo Foundation will be solicited for its support for at least a part of the faculty-time devoted to this program.

Background of Development: The first conference was held on November 6, 1969, in Rochester to discuss the establishment of a graduate degree program in Medical Microbiology after initial informal discussions were held by representatives of the interested departments. This conference was attended by representatives of the Mayo Graduate School and the Department of Microbiology and Immunology, by representatives of the University of Minnesota Departments of Microbiology, Pediatrics, Laboratory Medicine, and the School of Medical Technology, and by Dr. Horace Zinneman of the Veterans Administration Hospital in Minneapolis. The conferees agreed upon the need for such a program because of reasons already stated in the Introduction and the fact that such a program was not available in Minnesota, if indeed in more than four or five universities in the United States. A committee was constituted then to begin formulating a curriculum and consisted of: (1) Dr. John M. Matsen (Department of Laboratory Medicine, University of Minnesota), (2) Dr. Stephen Chapman (Department of Microbiology, University of Minnesota), (3) Miss Donna Blazevic (School of Medical Technology, University of Minnesota) and (4) Dr. John A. Washington (Department of

Microbiology and Immunology, Mayo Graduate School of Medicine with Dr. Gerald Needham (Mayo Graduate School) acting as chairman. This committee met on four occasions to discuss the proposal. On one of these occasions the committee met with Dr. Robert W. Bernlohr to discuss the University of Minnesota's new core curriculum in microbiology and on another occasion with Drs. Dennis Watson and Palmer Rogers to discuss details of inter-relationships between Medical Microbiology and the existing Department of Microbiology at the University of Minnesota. Finally, a meeting was held on March 26, 1970 in Rochester between several members of the University of Minnesota Department of Microbiology, including Dr. Watson, and the Staff of the Department of Microbiology and Immunology of the Mayo Graduate School of Medicine. General agreement was reached at this time to submit a proposal, as outlined in the previous paragraphs, to the Graduate School for approval. Since that time there have been informal visits to review various portions of the program. It is our understanding that the original proposal had the approval of Dr. Watson and his staff as well as that of Dr. Matsen and Dr. Wannamaker.

Since this time Dr. Edward V. Savard has joined the Department of Microbiology and has been given the responsibility by Dr. Watson to devise a similar program to the one outlined herein. Drs. Watson, Savard and Brand (Acting chairman in Dr. Watson's anticipated absence) and Dr. Ritts have agreed that these programs are complementary but independent. They have agreed that students from Rochester may take didactic portions at the University and portions of preceptorship may be taken at Mayo by Minneapolis students. In view of the report that Dr. Matsen will be leaving, it was agreed that Dr. Savard will integrate appropriate areas with Laboratory Medicine and Medical Technology at the University in the context of their program.



Having the endorsement of Dr. Watson, the Department of Micro-  
biology and Immunology of the Mayo Graduate School of Medicine respectfully  
petitions the Division of Education of the Mayo Graduate School of Medicine  
and the Graduate School of the University of Minnesota for approval of this  
new program in Medical Microbiology and the courses appropriate to it as  
appended to this document.

A handwritten signature in cursive script, appearing to read "Edwards", with a diagonal slash at the end.

February 15, 1971

## THE NATIONAL REGISTRY OF MICROBIOLOGISTS

## AMERICAN ACADEMY OF MICROBIOLOGY



REGISTRY COMMITTEE  
for  
REGISTRY PROGRAM  
SPECIALIST PROGRAM

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OFFICE OF THE CHAIRMAN  
DEPARTMENT OF MICROBIOLOGY  
UNIVERSITY OF GEORGIA  
ATHENS, GEORGIA  
30601

OFFICE OF THE REGISTRAR  
1913 EYE STREET, N.W.  
WASHINGTON, D.C. 20006

202 - 223-1305

The National Registry of Microbiologists is a committee of the American Academy of Microbiology and subject to the Board of Governors thereof. The National Registry is conducted by a Committee on Standards and Examinations appointed by the American Academy of Microbiology. The National Registry is a non-profit organization and members of the committee and examiners throughout the country receive no compensation. The National Registry derives its income from application, examination, and renewal fees, and these are set as closely as possible to the actual cost of the operations. The National Registry of Microbiologists derives its authority from the American Academy of Microbiology and is subject to the rules and regulations of that body.

REGISTERED MICROBIOLOGIST PROGRAM

I. Purpose of the Registry Program

A. Purpose - It is the purpose of the National Registry of Microbiologists' Registry Program to recognize persons with such a degree of education in the field of microbiology at the bachelor's level that these individuals have an adequate understanding of the scientific bases of applied methods. It is the intent of the program to provide recognition for training and scientific understanding in the field of microbiology but it does not provide for appraisal of laboratory competence.

B. Definition - For purposes of this Registry, a microbiologist is defined as one who, by education and training, is possessed of a knowledge of the nature, characteristics, cultural and metabolic properties of microorganisms, has the necessary skills to isolate, cultivate and identify such organisms, and can evaluate and interpret technically the results obtained. It is recognized by the Registry that there are several fields of study of microbiology and that the same knowledge is not required by microbiologists in different areas of work, but that there are certain common areas which all microbiologists should know and that each should, in addition, reach a specified degree of competence in his separate field.

II. Eligibility for Application to the Registry Program

A. Eligibility - To be eligible for application, the candidate must,

1. possess a bachelor's degree from a college or university accredited by one of the regional accrediting agencies (New England Association of Colleges and Secondary Schools, Southern Association of Colleges and Secondary Schools, Northwest Association of Secondary and Higher

Schools and the Western Colleges Association of Colleges and Secondary Schools, Middle States Association of Colleges and Secondary Schools, North Central Association of Colleges and Secondary Schools).

2. have a major or specialization in a biological science.
3. have a college education in the following: two years of chemistry including quantitative and organic chemistry, one year of physics, and mathematics through college algebra or its equivalent. (In the above a "year" is taken as two semesters or three quarters. The courses taken should be acceptable as prerequisites for more advanced courses in the respective fields.)
4. have approximately 30 semester credits or equivalent in biological science, of which at least 20 credits must be in the field of microbiology. (Microbiology is understood to involve the study of microorganisms and to include:
  - a. courses in bacteriology, immunology, mycology, parasitology, protozoology, rickettsiology, tissue culture and virology;
  - b. courses in food, dairy, industrial, sanitation, agricultural and applied bacteriology or microbiology;
  - c. courses in genetics, physiology, metabolism taxonomy, epidemiology, and animal or plant physiology provided that such courses are oriented toward the study of microorganisms and their behavior toward the reactions of various environments to the microorganisms.)
5. Be of good character.

B. Application - A person having these qualifications wishing to become a Registered Microbiologist may make application on the form available from:

The Registrar, National Registry of Microbiologists  
 American Academy of Microbiology  
 1913 I Street N.W.  
 Washington, D. C. 20006

The completed form, together with the valid transcript(s) from the college(s) where the courses were taken, is returned to the Registrar with a non-returnable fee of \$10.00 to cover the cost of handling. On this form the candidate shall specify those special fields of microbiology in which he wishes his special examination. If the applicant complies with the requirements listed above and is considered acceptable, the candidate will be notified and arrangements made for him to take the examination. These examinations are held under the direction of a member of the American Academy of Microbiology or a Diplomate of the American Board of Medical Microbiology at a location at or near the applicant's residence, as specified below.

If, in the judgment of the committee, the applicant does not meet the requirements listed above, he is so notified. Under some circumstances the Standards and Examinations Committee of the National Registry may admit to Examination persons not formally qualified but who, in the judgment of the committee, are nevertheless

otherwise qualified. An appeal for such action may be instituted by a request to the Registrar.

### III. Examination

- A. Purpose - The examination, for which a fee of \$20.00 is charged, is designed to provide concrete evidence that the candidate is familiar with the concepts, information, and factual knowledge appropriate to his field. The examination is not designed to measure the adequacy of background for a variety of possibilities.
- B. General Examination - Each candidate is required to pass a comprehensive written examination in general microbiology, covering the methods of isolation, cultivation, identification and some knowledge of the nutrition, metabolism, and physiology of microorganisms, with special emphasis on the bacteria.
- C. Specialty Examination - Each candidate is required to pass a comprehensive written examination in two of the following fields of specialization:
  - 1. Agricultural and Industrial Microbiology
  - 2. Food, Dairy and Sanitation Microbiology
  - 3. Pathogenic Bacteriology
  - 4. Immunology and Serology
  - 5. Virology (including Rickettsia)
  - 6. Mycology
  - 7. Parasitology

Specialty examination in addition to the two required may be taken on request at the additional fee of \$15.00 per specialty.

#### D. Nature and Conduct of Examinations

##### 1. Conduct of Examinations

- a. When the candidate has been accepted for examination and has specified the specialty examinations he wished to take, the general and the two specialty examinations prepared by the Standards and Examinations Committee (or by persons designated by them) are sent in a sealed envelope to the Fellow of the Academy giving the examination.
- b. On the examination day, the candidate completes the examination in the presence of the Academy Fellow who forwards the examination in a sealed signed envelope to the Registrar.
- c. The examination is graded by the Standards and Examinations Committee (or by persons designated by them) and the candidate is informed in due course as to whether or not he has passed the examination.

- d. Examinations are given geographically as near to the candidate's home as possible. This location will be in the office of a Fellow of the American Academy of Microbiology or a Diplomate of the American Board of Medical Microbiology. They can be given at almost anytime convenient for the candidate.

2. Notification of successful completion of examination

- a. Certificate. If the candidate has passed, his name is entered as a Registered Microbiologist of the National Registry of Microbiologists and he is sent a certificate to this effect. His name is entered in the Annual Registry of Microbiologists (together with the specialties in which the examination was satisfactorily completed), which publication is sent to the Registered Microbiologists, to employers of microbiologists, and to other interested persons.
- b. Annual Registry. The Annual Registry of Microbiologists, being an annual listing, requires that the Registered Microbiologist pay an annual registration fee of \$10.00 for which the Registered Microbiologist will receive a copy of the publication, may request it be sent to persons or organizations he desires, and is provided with a billfold-sized card certifying registration. If the Registered Microbiologist is inactive with respect to his professional position in microbiology for five consecutive years, he is not eligible for re-registration. Reinstatement is possible as in Item D-2-c.
- c. If a Registered Microbiologist neglects to maintain his annual Registry, his name will be dropped from the published list, but he may be reinstated up to a period of three years by payment of fees due the Registry. After three years, the Registered Microbiologist is permanently dropped from The Registry and must reapply and take the current examination as any other candidate.
- d. Registration as a Registered Microbiologist by the National Registry of Microbiologists is subject to revocation in the event that:
  - (1) The individual so registered shall have made any mis-statement or misrepresentation of a material fact in his application, or in any other communication to the National Registry of Microbiologists or its representatives, which mis-statement or misrepresentation affected the eligibility of the individual so registered.

- (2) It is ascertained that the individual so registered is not eligible in fact to receive such registration.
- (3) The individual receiving such registration shall, prior to the issuance of such registration or thereafter, have been convicted by a court of competent jurisdiction of a felony or any misdemeanor, which misdemeanor in the opinion of the National Registry of Microbiologists shall involve moral turpitude.

### 3. Notification of unsuccessful completion of examinations

If the candidate has failed any of the three parts of examination, he is notified. It is possible for a candidate to pass a part of the examination but fail one or more other parts. In this case he may repeat the sections failed (with a different examination) or be examined in other specialties at a fee of \$15.00. A specialty examination cannot be substituted for the general examination. If the repeated examinations are failed a second time, the whole examination must be rewritten at a full fee of \$20.00. No limit is placed on the number of times the entire examination may be taken.

#### NOTE:

Applicants applying for and taking the Registry examination immediately before graduation, should leave instructions that their final transcripts be forwarded to the Registrar of the National Registry of Microbiologists as soon after graduation as possible.

The Certificate of Registration cannot be issued until the final transcript is received.

### SPECIALIST IN PUBLIC HEALTH AND MEDICAL LABORATORY MICROBIOLOGY

#### I. Purpose of the Specialist Program

- a. Purpose - It is the purpose of the National Registry of Microbiologists to recognize persons with such a degree in education in the field of microbiology at the master's or doctoral level that these individuals have a capacity to supervise the effective operation of the microbiological procedures in a public health or medical laboratory. It is the intent of the Registry to provide recognition for training and scientific understanding in the field of microbiology but it does not provide for appraisal of laboratory competence.
- b. Definition - For purposes of this Registry, a microbiologist is defined as one who, by education and training, is possessed of a knowledge of the nature, characteristics, cultural and metabolic properties of microorganisms, has the necessary skills to isolate, cultivate and identify such organisms, can evaluate and interpret technically the results obtained, and can supervise the operation of a public health or medical laboratory engaged in these endeavors. It is recognized by the Registry that there are several fields

of study of microbiology and that the same knowledge is not required by microbiologists in different areas of work, but that there are certain common areas which all microbiologists should know and that each should, in addition, reach a specified degree of competence in his separate field.

## II. Eligibility for Application to Specialist Program

- a. Eligibility - To be eligible for application, the candidate must,
1. possess a master's degree in microbiology or a master's degree or earned doctoral degree in medicine or science from a college or university accredited by one of the regional accrediting agencies (New England Association of Colleges and Secondary Schools, Middle States Association of Colleges and Secondary Schools, Southern Association of Colleges and Secondary Schools, North Central Association of Colleges and Secondary Schools, Northwest Association of Secondary and Higher Schools and the Western Colleges Association of Colleges and Secondary Schools).
  2. have college education with passing grades in the following as a minimum:
    - (a) courses in chemistry including quantitative analytical and organic chemistry
    - (b) a course in physics
    - (c) mathematics through college algebra or its equivalent. (The courses taken should be acceptable as prerequisites for more advanced courses in the respective fields.)
  3. have a minimum of thirty semester credits or equivalent in the field of microbiology. Microbiology is understood to involve the study of microorganisms and to include:
    - (a) courses in bacteriology, immunology, mycology, parasitology, protozoology, rickettsiology, tissue culture and virology.
    - (b) courses in food, dairy, industrial, sanitation, agricultural and applied bacteriology or microbiology.
    - (c) courses in genetics, physiology, metabolism, taxonomy, epidemiology, and animal or plant physiology or biochemistry provided that such courses are oriented toward the study of microorganisms and their behavior or toward the reactions of various environments to the microorganisms.
  4. four years of experience is required in a public health or medical microbiology laboratory, two years of which must be gained in laboratories that are directed by persons with a doctoral degree. A medical residency program in clinical microbiology could be considered as experience.
  5. be of good character.

- b. Application - A person having these qualifications wishing to become a Specialist may make application on the form available from:

The Registrar, National Registry of Microbiologists  
 American Academy of Microbiology  
 1913 I Street N.W.  
 Washington, D. C. 20006

The completed form, together with the valid transcript(s) from the college(s) where the courses were taken, is returned to the Registrar with a non-returnable fee of \$10.00 to cover the cost of handling. If the applicant complies with the requirements listed above and is considered acceptable, the candidate will be notified and arrangements made for him to take the examination. The examination is held under the direction of a Fellow of the American Academy of Microbiology or a Diplomate of the American Board of Medical Microbiology at a location at or near the applicant's residence, as specified below.

If, in the judgment of the committee, the applicant does not meet the requirements listed above, he is so notified. Under some circumstances the Standards and Examinations Committee of the National Registry may admit to examination persons not meeting all the stated requirements but who, in the judgment of the committee, are nevertheless otherwise qualified by virtue of long and effective experience in microbiology. An appeal for such action may be instituted by a request to the Registrar.

### III. Examination

- a. Purpose - The examination, for which a fee of \$25.00 is charged, is designed to provide concrete evidence that the candidate is familiar with the concepts, information, and factual knowledge appropriate to his field. The examination is not designed to measure the adequacy of background for a variety of possibilities.
- b. Examination - Each candidate is required to pass a comprehensive written examination in public health and medical microbiology, covering bacteriology, immunology, mycology, parasitology and virology.
- c. Procedure for Examination
1. Conduct of Examination
    - (a) When the candidate has been accepted for the examination, the examination prepared by the Standards and Examinations Committee (or by persons designated by them) is sent in a sealed envelope to the Fellow of the Academy or Diplomate of the American Board of Medical Microbiology giving the examination.
    - (b) On the examination day, the candidate completes the examination in the presence of the Fellow or Diplomate who forwards the examination in a sealed signed envelope to the Registrar.
    - (c) The examination is graded by the Standards and Examinations Committee (or by persons designated by them) and the candidate is informed in due course as to whether or not he has passed the examination.



- (d) Examination is given geographically as near to the candidate's home as possible. This location will be in the office of a Fellow of the American Academy of Microbiology or a Diplomate of the American Board of Medical Microbiology. It can be given at almost any time convenient for the candidate.

2. Notification of successful completion of examination

- (a) Certificate - If the candidate has passed, his name is entered as a Specialist in Public Health and Medical Laboratory Microbiology and he is sent a certificate to this effect. His name is entered in the Annual Registry of Specialists which publication is sent to the Specialists, to employers of microbiologists, and to other interested persons.
- (b) Annual Registry - The Annual Registry of Specialists, being an annual listing, requires that the Specialist pay an annual registration fee of \$10.00, for which the Specialist will receive a copy of the publication, may request it be sent to persons or organizations he desires, and is provided with a billfold-sized card certifying registration. If the Specialist is inactive with respect to his professional position in microbiology for five consecutive years, he is not eligible for re-registration. Reinstatement is possible as in Item d-2-(c).
- (c) If a Specialist neglects to maintain his annual Registry, his name will be dropped from the published list, but he may be re-instated up to a period of three years by payment of fees due the Registry. After three years, the Specialist is permanently dropped from the Registry and must reapply and take the current examination as any other candidate.
- (d) Registration as a Specialist by the National Registry of Microbiologists is subject to revocation in the event that:
- (1) The individual so registered shall have made any misstatement or misrepresentation of a material fact in his application, or in any other communication to the National Registry of Microbiologists or its representatives, which misstatement or misrepresentation affected the eligibility of the individual so registered.
  - (2) It is ascertained that the individual so registered is not eligible in fact to receive such registration.
  - (3) The individual receiving such registration shall, prior to the issuance of such registration or thereafter, have been convicted by a court of competent jurisdiction of a felony or any misdemeanor, which misdemeanor in the opinion of the National Registry of Microbiologists shall involve moral turpitude.

3. Notification of unsuccessful completion of examination

If the candidate has failed the examination, he is so notified. For a fee of \$25.00 he may repeat the examination six months after the date of notification of failure. No limit is placed on the number of times the examination may be repeated.

4. Registry as a Specialist without Examination

Until June 30, 1974, an applicant may be registered as a Specialist without examination providing he can demonstrate to the satisfaction of the Registry Committee that he meets the above-described requirements for admission to the examination for registry as a Specialist. The only exception is that the requirement of the master's or doctoral degree would be waived during the five-year period ending June 30, 1974 for persons with established positions and eminence and who are members of the National Registry of Microbiologists with seven years or more of experience in microbiology in a public health or medical laboratory and are serving as a supervisor or its equivalent at the time of application. He must complete and return the regular Specialist application form to the Registrar.

Each applicant applying for Registry as a Specialist without examination must pay a fee of \$25.00 of which \$15.00 is returnable in case the application is not accepted. A person so becoming a Specialist is subject to the same Annual Registry regulations outlined in Item c-2-(b), above.

## MODEL CURRICULUM

MEDICAL MICROBIOLOGY (Dr. Washington)

- I. Host Parasite relationships (5 lectures)
- A. Infection and Disease (Dr. Ritts)  
Epidemics, zoonoses, endogenous, exogenous, carriers, transmission, infectivity, virulence (invasiveness, toxigenicity, enhancement) resistance and susceptibility.
  - B. Host-Defense mechanisms (Dr. Ritts)  
"Innate" factors, humoral, cellular
  - C. Normal microflora of man (Dr. Washington)
  - D. Opportunistic infection (Dr. Washington)  
Bacterial, fungal, viral
- II. Chemotherapy (4 lectures) (Dr. Washington)
- A. Action and pharmacology of antibiotics:  
description, activity, mode of action, absorption and distribution, toxicity, application
    1. peptides
    2. aminoglycosides
    3. chloramphenicol and tetracyclines
    4. macrolides
    5. sulfonamides
    6. Miscellaneous: lincomycins, vancomycin, novobiocin, nitrofurantoin, nalidixic acid
  - B. Drug resistance --- R Factors
  - C. Special considerations:  
combinations, prophylaxis, indications
  - D. Methods of in vitro testing:  
dilution and disc diffusion, assay
- III. Medical Bacteriology (Drs. Washington and Martin)
- A. Anaerobic bacteria: Clinical significance; methods of specimen collection and transport; techniques of anaerobiasis, anaerobic culture, identification; toxigenic characteristics.  
(3 lectures, laboratory: Mon.- Fri., 1-3 p.m.)
  - B. Enterobacteriaceae, Herbicola lathryi: Erwinia, Aeromonas, and Vibrios: Clinical significance; methods of collecting and preserving specimen; differential, selective, enrichment media; biochemical characterization; serological grouping.  
(3 lectures, laboratory: Mon.-Wed., 1-3 p.m.)

### III. Medical Bacteriology (Drs. Washington and Martin) continued

- C. Staphylococcus, Streptococcus, D. pneumoniae, Aerococcus viridans, and Neisseria: Clinical significance; methods of collecting and preserving specimens; media requirements; differential features; identification; serologic grouping.  
(3 lectures, laboratory: Mon.- Wed., 1-3p.m.)
- D. Haemophilus, Bordetella, Brucella, and Pasteurella (Yersinia): Clinical significance; methods of collecting and preserving specimen; media requirements; differential features; identification.  
(1 lecture, laboratory: Mon. - Wed., 1-3 p.m.)
- E. Corynebacterium, Listeria monocytogenes, Lactobacillus, Bacillus, and Erysipelothrix: Clinical significance; morphological and biochemical differential features; toxigenic characteristics.  
(1 lecture, laboratory: Mon.-Wed., 1 - 3 p.m.)
- F. Non-fermenting gram-negative bacilli (Pseudomadaceae, Mimeae, Achromobacteriaceae, and Alcaligenes): Clinical significance; isolation procedures; identification procedures.  
(2 lectures, laboratory: Mon. - Wed., 1 - 3 p.m.)

### IV. Medical Mycology (11 lectures) (Dr. Dolan)

- A. Fundamentals of Medical Mycology: Discussion and demonstrations of the somatic and reproductive phases of fungi; description of hyphae; exogenous, endogenous sexual and asexual spores; classification of fungi; gross and microscopic demonstration of common saprophytic fungi.  
  
Laboratory: Introduction to equipment and techniques used in studying fungi; start slide cultures of Aspergillus fumigatus; Penicillium sp.; Scopulariopsis sp.; Trichoderma sp.; Fusarium sp.; Cephalosporium sp.; Alternaria sp.; and Helminthosporium sp.
- B. Actinomycosis; Nocardiosis: Discussion and demonstrations of the etiologic agents; clinical types of infection; prognosis; therapy; epidemiology; pathology; immunology; and laboratory diagnosis.
- C. Aspergillosis; North American and South American Blastomycosis: Discussion and demonstrations of the etiologic agents; clinical types of infection; prognosis; therapy; epidemiology; pathology; immunology; and laboratory diagnosis.  
Laboratory: Start slide cultures, inoculate casein agar, Sabouraud's agar and do acid-fast and Gram stains of Nocardia asteroides; Streptomyces sp. and Mycobacterium fortuitum. Start slide cultures of Mucor sp.; Rhizopus sp. and Absidia sp. Inoculate thioglycollate enriched with TST and BHI Agar (with and without blood) with a strain of Actinomyces israeli.
- D. Coccidioidomycosis; Histoplasmosis: Discussion and demonstrations of the etiologic agents; clinical types of infection; prognosis; therapy; epidemiology; pathology; immunology and laboratory diagnosis.

## IV. Medical Mycology (Dr. Dolan) (continued)

- D. Laboratory: Study demonstration cultures and lacto-cotton blue stained slides of Blastomyces dermatitidis; Blastomyces brasiliensis; Coccidioides immitis and Histoplasma capsulatum. Start slide cultures and inoculate Sabouraud's dextrose agar - C and C with the following: M. canis; M. audouinii; M. gypseum; M. distortum; M. nanum; M. cookei; T. (Keratinomyces) ajelloi; T. terrestre; T. mentagrophytes; T. verrucosum; T. gallinae; T. megninii; T. rubrum; T. tonsurans; T. violaceum; T. schoenleinii; T. concentricum; and E. floccosum. Also, inoculate the T. verrucosum on one plate of inhibitory mold agar and incubate at 37°C.

- E. Candidosis; Geotrichosis; and Torulopsis glabrata infections: Discussion and demonstrations of the etiologic agents; clinical types of infection; prognosis; therapy; epidemiology; pathology; immunology; and laboratory diagnosis.

- F. Cryptococcosis; Phycomycosis and Sporotrichosis: Discussion and demonstrations of the etiologic agents; clinical types of infection; prognosis; therapy; epidemiology; pathology; immunology and laboratory diagnosis.

Laboratory: Set-up CMA Tween-80 plates; carbon utilizations; sugar fermentations; and germ tube tests of the following: C. albicans (serotypes A & B); C. tropicalis; C. pseudotropicalis; C. krusei; C. parapsilosis; Torulopsis glabrata; and Saccharomyces sp. Inoculate two CMA Tween-80 plates with Geotrichum sp. and Trichosporan sp. Inoculate Sporotrichum schenckii on BHI blood agar at 37°C and Sabouraud's dextrose agar at 25°.

- G. Chromomycosis; Eumycotic mycetoma; Erythrasma; Piedra; Tinea nigra; Tinea versicolor and Trichomycosis axillaris: Discussion and demonstrations of the etiologic agents; clinical types of infection; therapy; and laboratory diagnosis.

Laboratory: Set-up carbon and nitrate utilization tests; urease test; growth at 30°C and 37°C; CMA-T-80 plates; "birdseed" agar; and mouse virulence tests of the following: C. neoformans; C. albidus and C. laurentii. Study previously inoculated tests.

- H. Introduction to dermatophytes: Discussion and demonstrations of the etiologic agents; clinical types of infection; therapy; and laboratory diagnosis: M. canis; M. audouinii; M. gypseum; M. distortum; M. nanum; M. cookei; M. fulvum and M. vanbreuseghenii.

- I. Discussion and demonstrations of the etiologic agents; clinical types of infection; therapy; and laboratory diagnosis: T. ajelloi; T. terrestre; T. mentagrophytes, T. verrucosum; T. gallinae; T. megninii; T. rubrum; T. tonsurans; T. violaceum; T. schoenleinii; T. concentricum; T. equinum and E. floccosum.

Laboratory: Study previously inoculated tests. Review self-study sets of lacto-cotton blue slides, histologic slides and kodachrome slides.

## IV. Medical Mycology (Dr. Dolan) (continued)

J. Antifungal agents: Amphotericin-B; Nystatin and 5-fluorocytosine. Discussion of their chemistry; mechanism of action; methods of in vitro susceptibility testing; methods of biological assay; pharmacology; toxicity and therapeutic uses.

K. Review of pertinent information covered during the course.

## V. Mycobacteria (7 lectures) (Dr. Karlson)

## A. Classification

## 1. Named mycobacteria

## a. Pathogenic species

(1) Nonculturable (leprosy in man and in animals)

(2) Culturable

(a) Tubercle bacilli (four or five species)

(b) Other mycobacteria

## b. Saprophytic mycobacteria

## 2. Anonymous Mycobacteria

## a. Skotochromogen

## b. Photochromogens

## c. Avia-like (Battey)

## d. Saprophytic nonchromogens

## e. Rapid Growers

B. *Mycobacterium leprae*; *Mycobacterium lepraemurim*; *Mycobacterium tubulorum*. To include methods for demonstrating leprosy bacilli tissue, discussion of lepromen, bacteriostatic effect of anti-leprosy drugs on other mycobacteria. The leprosy-like diseases of animals will be briefly mentioned.

C. Tubercle bacilli

D. *Mycobacterium tuberculosis*

E. *Mycobacterium bovi*; *Mycobacterium avium*; *Mycobacterium microti*; "*Mycobacterium africanum*".

Sessions C, D, and E will include methods of culture, procedures for identification, drug sensitivity tests, serologic differentiation of *M. avium* types, and pathogenicity for experiment animals, and significance of direct microscopy. Tuberculin and the tuberculin test, Bacille Calmette-Guerin.

F. *Mycobacterium kansasii*; *Mycobacterium marinum*; *Mycobacterium ulcerans*.

1. Methods of culture, procedures for identification, growth characters, drug sensitivity tests, cross reactions with tuberculin.

G. Nonphotochromogens (Battey bacilli)

## 1. Skotochromogens

## 2. Rapid growers

3 *Mycobacterium fortuitum*

Growth characters, means of identification and the significance.

## VI. Virology (ten lectures)

- A. Structure, classification and nomenclature, physical and chemical properties, structure (helical isometric, complex) viral enzymes.
- B. Isolation, propagation, identification animal, eggs, cell, tissue, CPE, serological.
- C. Growth and regulation, infection.  
Replication, adsorption and penetration, eclipse phase, DNA, RNA codons; interference, exclusion, resistance; interferon and possible modes of action.
- D. Oncogenic and defective virus  
Transformation; DNA viruses and RNA viruses
- E. Animal viruses of medical importance  
Picornaviruses: polio and Coxsackie and Echo; Rhino. Adenovirus.
- F. continued. Arboviruses, Myxoviruses and Paramyxovirus, influenza, RSU, rubella, measles, mumps
- G. continued. Rhabdoviruses; Herpesviruses. Varicella-zoster, cytomegaloviruses, infectious mono, poxviruses
- H. continued. LCU, hepatitis, slow virus
- I. Rickettsia, Bedsonia
- J. Mycoplasma

VII. Seminar: Weekly conference held jointly with Infectious Disease Division of Department of Medicine covering clinical and laboratory aspects of infectious diseases.

VIII. IMMUNOLOGY COURSE OUTLINE

( 8-854) ( 8-855)

## A. Physico-Chemical Methods Used in Immunology: (Dr. H. Markowitz)

1. Spectrophotometry; visible, UV, IR, fluorescence, ORD, Circular Dichroism. Dr. Markowitz
2. Chromatography: Partition, ion exchange, including gas chromatography and thin layer chromatography. Dr. Markowitz
3. Gel Permeation Chromatography: Theory and applications. Use for determination of stokes radius. Dr. Gleich
4. Ultracentrifugation: Theory and application. Dr. McDuffie
5. Electrophoresis: Free and with supporting media; types of media, theory and applications; preparative. Dr. Markowitz

Examination

## B. Antigen-Antibody Reactions: (Dr. H. Markowitz)

1. Reactions with Soluble Macromolecules: Quantitative precipitin reaction, Lattice theory, valence and complexity of protein antigens; factors affecting precipitation, non-precipitating antibodies, applications. Dr. Markowitz
2. Reactions with Soluble Macromolecules: (continued) Hapten inhibition, quantitative hapten inhibition; cross-reactions and types of; flocculation. Precipitin reactions in gels, including Ouchterlony, Oudin, Preer and Template methods, and immunoelectrophoresis. Agglutination, quantitative, passive. Dr. Markowitz
3. Reactions with Simple Haptens: Valence and affinity of antibody, intrinsic association constant, equilibrium dialysis, heterogeneity index, forces involved in antigen-antibody reactions: Thermodynamics. Dr. Markowitz
4. Fluorescence Applied to Immune Reactions: Immunofluorescence and its applications; fluorescence quenching; fluorescence polarization; fluorescence enhancement. Dr. Markowitz
5. Use of Radioisotopes in Immune Reactions: Radioimmuno-electrophoresis, radioimmunoassay, radioimmunoprecipitation; radioautography in detection of radiolabelled reagents; choice of isotopes. Dr. Gleich
6. Other Methods: Antigen-antibody crossed electrophoresis; localization for electron microscopy by ferritin labelling (use of Peroxidase in EM); use of ultracentrifuge; use of electron-spin resonance. Dr. Markowitz

Examination



VIII. IMMUNOLOGY COURSE OUTLINE (continued)

## C. Immunoglobulins: (Dr. G. J. Gleich)

1. Introduction: Review of protein structure; history of information concerning antibodies; immunoglobulin concept;  $\gamma$ G, structure, enzyme degradation; correlation of fragments and chains; genetic types; chain types; pathological immunoglobulins, light chain types; light chain amino acid sequences; heavy chain sequences; idiotypic specifications. Dr. Gleich
2. Immunoglobulins: Continuation of Lecture 1,  $\gamma$ M and  $\gamma$ A. Dr. Gleich
3. Immunoglobulins:  $\gamma$ D and  $\gamma$ E. Dr. Gleich
4. Immunoglobulins: Biological activities, cryoglobulins, pyroglobulins. Dr. Gleich

## D. Antigens: (Dr. H. Markowitz)

1. Proteins, polysaccharides; synthetic polypeptides, bacterial; blood group substances; molecular weight. Dr. Markowitz
2. Nucleic acids; chemically modified antigens; antigenic determinants and the size of the combining site (lower and upper limits); shape of combining site. Dr. Markowitz

Examination

## E. Complement: (Dr. F. C. McDuffie)

1. Nomenclature: Measurement of fixation, components of complement; history of development; R reagents; reaction sequence in immune hemolysis, approaches to problem of component purification, i.e., functional vs. physico-chemical; one-hit theory antibodies reactive. Dr. McDuffie
2. Components of Complement, C'1, C'4, C'2. Dr. McDuffie
3. Components of Complement, C'3. Dr. McDuffie
4. Components of Complement, C'5, C'6, C'7, C'8, C'9. Dr. McDuffie
5. Biological Activities Associated with the Complement System: C'1 esterase and skin permeability; generation of kinins like substance by C'1 esterase, role in phagocytosis; immune adherence. Dr. McDuffie
6. Biological Activities Associated with Complement: Deficiencies in experimental animals; effects of hormones, anaphylotoxin (C'3 and C'5), anaphylotoxin-inactivator, C'3-preinactivator; chemotaxis; lysis of cells. Dr. McDuffie

Examination

VIII. IMMUNOLOGY COURSE OUTLINE (continued)

## F. Hypersensitivity: (Dr. G. J. Gleich)

1. Anaphylaxis, characteristics of, cutaneous, systemic, passive, reversed passive, evidence for cellular fixation of antibodies; homo- and heterocytotrophic antibodies; desensitization. Dr. Gleich
2. Anaphylaxis: Antibodies involved in; in man; P-K test; IgE, blocking antibodies; biochemical events; role of cycli-AMP. Aggregate and cytotoxic anaphylaxis. Dr. Gleich
3. Anaphylaxis: Mediators, histamine, serotonin, bradykinin, SRS-A, Kallikrein; relation to clotting systems and complement. Dr. Gleich
4. Arthus Reaction: Description; types of, cellular reaction; antibodies in, role of C and granulocytes; lysosomes and enzymes from. Dr. Gleich
5. Arthus Reaction and Serum Sickness: Localization of Ag-Ab aggregates; phases; glomerulonephritis associated with. Dr. Gleich
6. Delayed Hypersensitivity: History of discovery, Koch phenomenon, tuberculin shock; induction with Freund's adjuvant; transfer by cells and by transfer factor. Dr. Ritts
7. Delayed Hypersensitivity: In Vitro models; lymphocytes and macrophages; lymphotoxin. Dr. Ritts

Examination

## G. Antibody Formation: (Dr. F. C. McDuffie)

1. Natural antibodies; immunization of animals; adjuvants, action of; kinetics of antibody formation; immunoglobulin sequence; primary and secondary responses; "Original Antigenic Sin" antigenic competition. Dr. McDuffie
2. Fate of Injected Antigens: Genetics factors, DNP-PL immunization, responders and non-responders; site of antibody synthesis; localization of antigens and antibodies. Dr. McDuffie
3. Secretion of Antibody by Cells: Cells involved in antibody formation; role of macrophages; antibody formation by single cells; antibody formation in vitro; evidence for precursors of antibody forming cells demonstrating single specificities; the bone marrow and the Bursa of Fabricius. Dr. McDuffie
4. Tolerance and Immunosuppressive Agents: Ontogeny and phylogeny of immune response; antibody formation at the molecular level. Dr. Ritts
5. Theories of Antibody Formation and Tolerance: Selective vs. instructive; clonal selection; evidence for and against; "How much of the Genome for Immunology?" Problem of "GOD" (Generation of diversity). Dr. McDuffie

VIII. IMMUNOLOGY COURSE OUTLINE (continued)

## H. Transplantation Immunology: (Dr. R. E. Ritts)

1. The Allograft Reaction: first and second set, transfer delayed hypersensitivity; tolerance. Dr. Ritts
2. Histocompatibility Genes: tests for matching; graft-vs-host reaction. Dr. Ritts
3. Tumor Immunology: Tumor specific antigens and virus induction; role of immune systems in tumor suppression. Dr. Ritts

## I. Autoimmunity: (Dr. R. E. Ritts)

1. Mechanisms of Induction of Autoantibodies: Passive (transfusion reactions) hemolytic processes. Dr. Ritts
2. Representative Experimental Models: Allergic encephalomyelitis and thyroiditis. Dr. Ritts
3. Human Diseases Associated with Autoimmunity. Dr. McDuffie

Final Examination

	FALL	WINTER	SPRING	SUMMER
FIRST YEAR	M Bact. Physiol. 121* (3) M Gen. Biochem. 141 (3) M " " Lab. 145 (3) M Bus.Adm. 8-001 (3) M Seminar (1) <hr/> Biochem. 8-852 (3) Clin.Micro.& Immunol.8-851 (2) Lect.Micro. 8-852 (2) † Biostatistics 8-823 (3) Seminar (1) <p style="text-align: center;">(to 10 credits)</p>	Med.Micro. § (3) Seminar Immunol. 8-856 (1) " Micro. § (1) Biochem. 8-853 (3) † Immunol. 8-854 (2) † Biostat. 8-824 (3) <p style="text-align: center;">(to 10 credits)</p>	Med.Micro. § (3) Seminar Immunol.8-856 " Micro. § † Immunol. 8-855 (2) † Biostat. 8-825 (3) Parasitology § (1) <p style="text-align: center;">(to 10 credits)</p>	<p style="text-align: center;"><u>Preceptorship</u></p> Bact. 8 wks. Mycobact. 2 wks. Antibiotics 2 wks. Parasitol. 2 wks. Mycology 4 wks. Immunol. 2 wks. Virology 4 wks. Programming 8 wks. elective <p style="text-align: center;">Plan A can begin thesis</p>
SECOND YEAR	† Biostat. (3) Seminar (1) Complete preceptorship B Begin thesis A	† Biostat. (3) † Immunol. (2) Seminar (1) Project B Computer lang. Thesis	† Biostat. (3) † Immunol. (2) Seminar (1) project Student supervisor Thesis	

M = Minneapolis Campus

† Alternate years as appropriate for student

\* Bact. physiol. 121 may be offered to Rochester Campus via TV (closed circuit or video tape)

§ Proposed course

MAYO GRADUATE SCHOOL FACULTY STATUS  
MAY 24, 1971

688 RITTS, ROY ELLOT, JR. MAYO APPT.- 11-27-1967 FACULTY RANK- B  
ACADEMIC RANK- PROFESSOR MED. FLD.- M

SECTION ASSIGNMENT- MICROBI 38 H APPT. AS SECTION HEAD.- 11-67

DATE AND PLACE OF BIRTH- 01-16-1929 ST PETERSBURG, FLORIDA

COLLEGE/MEDICAL SCHOOL TRAINING WITH DEGREES AND INSTITUTIONS CONFERRING THEM

GEORGE WASHINGTON UNIVERSITY	WASHINGTON DC	AB	00/47
GEORGE WASHINGTON UNIVERSITY	WASHINGTON DC	MD	00/51

INTERNSHIPS-

DC GENERAL HOSPITAL	WASHINGTON DC		00/51-00/52
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RESIDENCIES-

GEORGE WASHINGTON UNIVERSITY	WASHINGTON DC	I	00/52-00/54
HARVARD UNIVERSITY	BOSTON MASSACHUSETTS	I	00/54-00/55

PROFESSIONAL PREPARATION / ACADEMIC EXPERIENCE

PETER BENT BRIGHAM HOSP BOSTON	ASST IN I		00/54-00/55
ROCKEFELLER INSTITUTE	VISITING INVESTIGATOR		00/55-00/57
ROCKEFELLER INSTITUTE	RESEARCH ASSOCIATE		00/57-00/58
GEORGETOWN UNIVERSITY	ASSOC PROFESSOR OF M		00/58-00/61
GEORGETOWN UNIVERSITY	CHAIRMAN DEPT OF M		00/59-00/64
NIH CLINICAL CENTER	CONSULTANT IN CL PATH		00/59-00/64
GEORGETOWN UNIVERSITY	PROFESSOR OF M		00/61-00/64
US NAVY HOSPITAL BETHESDA	LECTURER IN I & IMMUN		00/61-00/64
WALTER REED ARMY MED RES CTR	SPECIAL LECTURER IN I		00/62-00/64
AMA DIV SCIENTIFIC ACTIVITIES	ASST DIRECTOR		00/64-00/65
AMA ED & RES FDN	DIR INST FOR BIOMED RES		00/64-00/68
UNIVERSITY OF CHICAGO	PROF LECTURER IN IMMUN		00/64-00/68
AMERICAN MEDICAL ASSOCIATION	DIRECTOR OF MED RESEARCH		00/66-00/68
MAYO CLINIC	CONSULTANT IN M		11/67-01/68
MAYO GRADUATE SCHOOL	PROFESSOR OF M	C	01/68

BOARD CERTIFIED-

SPECIALTIES M

EXTRA-MURAL ACTIVITIES- (MEMBERSHIPS, HONORS ETC.)

INFECTIOUS DIS SOC AMER	
NEW YORK ACADEMY OF SCIENCE	
SOC SIGMA XI	
AMER SOC OF MICROBIOLOGISTS	
SOCIETY FOR GEN MICROBIOLOGY	ENGLAND
RETICULOENDOTHELIAL SOCIETY	
SOC OF EXPER MED & BIOLOGY	
ALPHA OMEGA ALPHA	
AMER ACADEMY OF MICROBIOLOGY	FELLOW
ROYAL SOC OF TROP MED & HYGIEN	FELLOW
AMERICAN RHEUMATISM ASSOC	
AMER ASSOC OF PATH & BACT	
AMER SOC OF TROPICAL I & HYG	
AMER SOC FOR EXPER PATHOLOGY	

Ritts, Roy E., Jr.  
(cont.)

AMER FEDER CLIN RESEARCH		1952
AM ACAD ARTS & SCIENCES	ADV COMM HUMAN EXPERIMENTA	1969-1962
AMERICAN BOARD OF MICROBIOLOGY MBR		1968-1964
AMERICAN BOARD OF MICROBIOLOGY	CHRMN COMM I CERT	1968-1966
ROYAL SOCIETY OF HEALTH	FELLOW	-1969
DHEW	SPECIAL CONSULTANT	-1970
DHEW-USPHS-FDA	CHRMN SCIENCE ADV COMM	1971-1970

RESEARCH INTERESTS-

HOST-PARASITE INTERACTIONS  
IMMUNOLOGY ESP MECHANISMS IN DELAYED TYPE-HYPERSENSITIVITIES, TOLERANCE,

MAYO GRADUATE SCHOOL FACULTY STATUS  
FEBRUARY 8, 1971

4014 KARLSON, ALFRED GUSTAV MAYO APPT.- 01-01-1946 FACULTY RANK- B  
ACADEMIC RANK- PROFESSOR MED. FLD.- PATH

SECTION ASSIGNMENT- MICROBI 38 M

DATE AND PLACE OF BIRTH- 04-26-1910 VIRGINIA, MINNESOTA

COLLEGE/MEDICAL SCHOOL TRAINING WITH DEGREES AND INSTITUTIONS CONFERRING THEM			
UNIVERSITY OF MINNESOTA	MINNEAPOLIS, MINN.		09/28-06/30
IOWA STATE UNIVERSITY	AMES IOWA	BS MS	09/31-06/37
IOWA STATE UNIVERSITY	AMES, IOWA	DVM	PATH 09/31-06/37
UNIVERSITY OF MINNESOTA	MINNEAPOLIS, MINNESOTA	PHD	PATH 07/38-11/42

RESIDENCIES-		
FELLOW IN COMP PATH	MAYO GRADUATE SCHOOL	07/38-07/39
USA		12/41-12/45

PROFESSIONAL PREPARATION / ACADEMIC EXPERIENCE		
IOWA STATE COLLEGE	INSTRUCTOR VET HYGIENE	06/35-07/38
UNIVERSITY OF MINNESOTA	INST. IN VET RESEARCH	07/39-12/41
MAYO CLINIC	CONSULTANT IN COMP PATH	01/46-07/46
MAYO GRADUATE SCHOOL	INSTRUCTOR IN COMP PATH	07/46-07/51
MAYO GRADUATE SCHOOL	ASST PROF OF COMP PATH	07/51-07/56
MAYO GRADUATE SCHOOL	ASSOC PROF OF COMP PATH	07/56-07/62
MAYO GRADUATE SCHOOL	PROFESSOR OF COMP PATH. C	07/62

BOARD CERTIFIED-  
SPECIALTIES M  
SUB-SPEC. VPATH

EXTRA-MURAL ACTIVITIES- (MEMBERSHIPS, HONORS ETC.)		
AMER VETERINARY MEDICAL ASSOC	EDITORIAL BOARD	1964
SOC FOR EXPER BIOL & MEDICINE		1964
AMER ASSOC OF PATH & BACTERIOL		1964
AMER SOC FOR MICROBIOLOGY	COMM ON TAXONOMY OF MYCOBACTERIA	1964
CONF RES WORKER ANIMAL DISEASE	SEC-TREAS 47-64	1964
AMERICAN ACAD OF MICROBIOLOGY		1964
OLOGICAL ABSTRACTS	EDITOR SECT ON VETERINARY SCIENCE	1964
AMERICAN THORACIC SOCIETY	COMM ON RESEARCH 61-64	1964
NATL TUBERCULOSIS ASSOC	BOARD OF DIRECTORS 62-69	1964
NATL TUBERCULOSIS ASSOC	COMM ON SPECIAL GRANTS 63-67	1964
VETERANS ADMINISTRATION	COM EVAL OF INFEC AGENTS RES	
TRUDEAU INSTITUTE	COM TYPE COLLECTION MYCOBACTERIA	
MINNESOTA THORACIC SOCIETY	PRESIDENT-1965	

Karlson, Alfred G.  
(cont.)

MINN PUBLIC HEALTH CONFERENCE  
MINN STATE VETERINARY MED SOC  
HENRICI SOC MINN BACTERIOLOGIS  
MINN TUBERCULOSIS & HLH ASSOC  
MINN TUBERCULOSIS & HLH ASSOC  
SIGMA XI  
NATIONAL TB ASSOC  
MINERAL SPRINGS SANATORIUM  
AMER COLL OF VETERINARY PATH  
AMER COLL VETERINARY PATH  
IOWA STATE UNIVERSITY  
AMER SOC FOR MICROBIOLOGY  
AMER SOC FOR MICROBIOLOGY  
INTL ASSN MICROBIOLOGICAL SOC

BOARD OF DIRECTORS 60-9  
CHAIRMAN COMMITTEE ON RESEARCH  
MAYO FDN CHP SEC-TREAS 64-8 PRES 69  
GUIDANCE COMM-TB PROGRAM 65-68  
BD OF COMM & EXEC COMM  
CERTIFIED 1947  
PRESIDENT 48-50  
ALUMNI MERIT AWARD 65  
APPLIED MICROBIOLOGY ED BOARD  
JOUR BACT EDIT BOARD 51-56  
SUBCOMMITTEE

1964  
1964  
1964  
1964  
1964

RESEARCH INTERESTS-

BACTERIOLOGY OF MYCOBACTERIAL DISEASES AND CHEMOTHERAPY OF EXPERIMENTAL INFECTIONS



MAYO GRADUATE SCHOOL FACULTY STATUS  
MAY 24, 1971

1034 MCDUFFIE, FREDERIC CLEMENT MAYO APPT.- 04-01-1965 FACULTY RANK- A3  
ACADEMIC RANK- ASSOC PROF MED. FLD.- M

SECTION ASSIGNMENT- MICROBI 38 M

DATE AND PLACE OF BIRTH- 04-27-1924 LAWRENCE, MASSACHUSETTS

COLLEGE/MEDICAL SCHOOL TRAINING WITH DEGREES AND INSTITUTIONS CONFERRING THEM  
HARVARD MEDICAL SCHOOL CAMBRIDGE MASSACHUSETTS MD 09/47-06/51

INTERNSHIPS-  
PETER BENT BRIGHAM HOSPITAL BOSTON MASSACHUSETTS 07/51-07/52

RESIDENCIES-  
PETER BENT BRIGHAM HOSPITAL BOSTON MASSACHUSETTS 07/52-07/53  
FELLOW IN PHYS CHEM HARVARD UNIVERSITY 07/53-07/54  
FELLOW IN N AND M COLUMBIA COLLEGE 07/54-07/56  
PETER BENT BRIGHAM HOSPITAL BOSTON MASSACHUSETTS 07/56-07/57

PROFESSIONAL PREPARATION / ACADEMIC EXPERIENCE  
UNIVERSITY OF MISSISSIPPI ASST PROF OF I 07/57-07/62  
UNIVERSITY OF MISSISSIPPI ASST PROF OF M 07/57-07/64  
UNIVERSITY OF MISSISSIPPI ASSOC PROF OF I 07/62-03/65  
UNIVERSITY OF MISSISSIPPI ASSOC PROF OF M 07/64-03/65  
MAYO CLINIC CONSULTANT IN M 04/65-07/65  
MAYO GRADUATE SCHOOL ASST PROF OF I&M 07/65-01/69  
MAYO GRADUATE SCHOOL ASSOC PROF OF I & M C 01/69

BOARD CERTIFIED-  
SPECIALTIES I

EXTRA-MURAL ACTIVITIES- (MEMBERSHIPS, HONORS ETC.)  
AMERICAN HEART ASSOCIATION GREAT PLAINS REG RES COMM 1968-1967  
ARTHRITIS FOUNDATION FELLOWSHIP COM 1969-1967  
AMERICAN HEART ASSOCIATION GREAT PLAINS REG RES COMM V CHR MN 1969-1968  
AMERICAN HEART ASSOCIATION GREAT PLAINS REG RES COMM CHR MN 1970-1969

RESEARCH INTERESTS-  
IMMUNOLOGY CONNECTIVE TISSUE DISEASES, COMPLEMENT, IMMUNOGLOBULIN  
PRODUCTION

## MAYO GRADUATE SCHOOL FACULTY STATUS

MAY 24, 1971

GLEICH, GERALD JOSEPH MAYO APPT. 04-01-1965 FACULTY RANK A2  
 ACADEMIC RANK ASST PROF MED. FLD. M

SECTION ASSIGNMENT- MICROBI 38 M

DATE AND PLACE OF BIRTH- 05-14-1931 ESCANABA, MICHIGAN

## COLLEGE/MEDICAL SCHOOL TRAINING WITH DEGREES AND INSTITUTIONS CONFERRING THEM

MICHIGAN COLLEGE OF TECHNOLOGY	HOUGHTON, MICHIGAN		09/49-06/50
UNIVERSITY OF MICHIGAN	ANN ARBOR, MICHIGAN	BA	09/50-06/53
UNIVERSITY OF MICHIGAN	ANN ARBOR, MICHIGAN	MD	09/53-06/56

## INTERNSHIPS-

PHILADELPHIA GENERAL HOSPITAL	PHILADELPHIA, PA		06/56-07/57
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## RESIDENCIES-

FELLOW IN BIOC	UNIVERSITY OF MICHIGAN		06/53-09/53
FELLOW IN BIOC	UNIVERSITY OF MICHIGAN		06/54-09/54
USAF			08/57-08/59
JACKSON MEMORIAL HOSPITAL	MIAMI, FLORIDA		09/59-07/61
UNIVERSITY OF ROCHESTER	ROCHESTER NEW YORK		07/61-07/63

## PROFESSIONAL PREPARATION / ACADEMIC EXPERIENCE

UNIVERSITY OF ROCHESTER	INSTRUCTOR IN I		07/63-04/65
MAYO CLINIC	CONSULTANT IN M		04/65-07/65
MAYO GRADUATE SCHOOL	INSTRUCTOR IN I & M		07/65-07/68
MAYO GRADUATE SCHOOL	ASST PROF OF I & M	C	07/68

## BOARD CERTIFIED-

SPECIALTIES	I
SUB-SPEC.	A

MAYO GRADUATE SCHOOL FACULTY STATUS  
MAY 24, 1971

688 WASHINGTON, JOHN AUGUSTINE, II MAYO APPT. C2-C1-1968 FACULTY RANK A2  
ACADEMIC RANK ASST PROF MED. FLD. M

SECTION ASSIGNMENT MICROBI 38 M

DATE AND PLACE OF BIRTH 05-29-1936 ISTANBUL, TURKEY

COLLEGE/MEDICAL SCHOOL TRAINING WITH DEGREES AND INSTITUTIONS CONFERRING THEM

UNIVERSITY OF VIRGINIA	CHARLOTTESVILLE VA	BA	09/54-06/57
JOHNS HOPKINS UNIVERSITY	BALTIMORE MARYLAND	MD	09/57-06/61

INTERNSHIPS

DUKE UNIVERSITY	DURHAM NORTH CAROLINA		07/61-07/62
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RESIDENCIES

DUKE UNIVERSITY	DURHAM, NORTH CAROLINA		07/62-06/63
NATIONAL CANCER INSTITUTE	BETHESDA, MARYLAND	FELLOWSHIP	07/63-06/65
NATIONAL INSTITUTES OF HEALTH	BETHESDA, MARYLAND	CL PATH	07/65-06/67
MAYO CLINIC	ASSOCIATE CONSULTANT	M	07/67-01/68

PROFESSIONAL PREPARATION / ACADEMIC EXPERIENCE

NIH, BETHESDA	ASST CHIEF, MICROBIOLOGY		05/66-06/67
MAYO CLINIC	CONSULTANT IN M		02/68-07/68
MAYO GRADUATE SCHOOL	INSTRUCTOR IN M		07/68-07/70
MAYO GRADUATE SCHOOL	ASST PROF OF M	C	07/70

BOARD CERTIFIED

SPECIALTIES	CPATH
SUB-SPEC.	M

EXTRACURRICULAR ACTIVITIES (MEMBERSHIPS, HONORS ETC.)

AMER ASSN OF PATH & BACT		
SIGMA XI		
AMER SOC FOR MICROBIOLOGY		
AMER SOC OF CL PATH	COUNC ON MICRO	1971-1969
AMER SOC OF CL PATH	MICRO TEST COM, SELF ASS PROG	-1970

RESEARCH INTERESTS

SUSCEPTIBILITY TESTING.  
DEVELOPMENT OF NUTRICOLOGY IN DIAGNOSTIC BACTERIOLOGY AND ANTIMICROBIAL

MAYO GRADUATE SCHOOL FACULTY STATUS  
MAY 24, 1971

0008 DOLAN, CHARLES TERRENCE MAYO APPT.- 02-01-1969 FACULTY RANK- A2  
ACADEMIC RANK- INSTRUCTOR MED. FLD.- M

SECTION ASSIGNMENT- MICROBI 38 M

DATE AND PLACE OF BIRTH- 03-27-1937 KANSAS CITY, MISSOURI

COLLEGE/MEDICAL SCHOOL TRAINING WITH DEGREES AND INSTITUTIONS CONFERRING THEM

UNIVERSITY OF MISSOURI	KANSAS CITY MISSOURI	BS	09/54-06/58
CREIGHTON UNIVERSITY	OMAHA NEBRASKA	MD	09/58-06/62

INTERNSHIPS-

CREIGHTON MEM ST JOSEPH HOSP	OMAHA NEBRASKA		07/62-06/63
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RESIDENCIES-

FELLOW IN PATH	MAYO GRADUATE SCHOOL		07/65-03/68
FELLOW IN MICROBIOLOGY	MAYO GRADUATE SCHOOL		04/68-10/68
ASSOCIATE CONSULTANT	MAYO CLINIC		11/68-01/69

PROFESSIONAL PREPARATION / ACADEMIC EXPERIENCE

USPHS			07/63-06/65
MAYO CLINIC	CONSULTANT IN M		02/69-10/69
MAYO GRADUATE SCHCOL	INSTRUCTOR IN M	C	10/69

BOARD CERTIFIED-

SPECIALTIES PATH

EXTRA-MURAL ACTIVITIES- (MEMBERSHIPS, HONORS ETC.)

ALPHA OMEGA ALPHA

RESEARCH INTERESTS-

PATHOLOGIC AND MICROBIOLOGIC STUDIES OF PNEUMONIA AT POSTMORTEM.  
DEVELOPMENT OF IMPROVED METHODS OF ISOLATING AND IDENTIFYING FUNG2  
DEVELOPMENT OF SEROLOGIC TESTS FOR THE CLINICAL DIAGNOSIS OF INFE 02,

MAYO GRADUATE SCHOOL FACULTY STATUS  
MAY 24, 1971

MARTIN, WILLIAM JEFFERY  
ACADEMIC RANK- ASST PROF

MAYO APPT.- 11-01-1969 FACULTY RANK- A3  
MED. FLD.- M

SECTION ASSIGNMENT- MICROBI 38 M

DATE AND PLACE OF BIRTH- 04-26-1932 WASHINGTON, D.C.

COLLEGE/MEDICAL SCHOOL TRAINING WITH DEGREES AND INSTITUTIONS CONFERRING THEM

CREIGHTON UNIVERSITY	OMAHA NEBRASKA		09/50-01/52
SOUTHERN METHODIST UNIV	DALLAS TEXAS		02/52-01/53
CREIGHTON UNIVERSITY	OMAHA NEBRASKA		02/53-01/54
UNIVERSITY OF OMAHA	OMAHA NEBRASKA	BA	02/56-01/57
UNIVERSITY OF UTAH	SALT LAKE CITY	MS	09/57-06/63
UNIVERSITY OF UTAH	SALT LAKE CITY	PHD	09/65-00/00

PROFESSIONAL PREPARATION / ACADEMIC EXPERIENCE

US ARMY			05/54-02/56
COMMUNICABLE DIS CENTER	ATLANTA GEORGIA		06/65-11/69
MAYO CLINIC	CONSULTANT IN M		12/69-07/70
MAYO GRADUATE SCHOOL	ASST PROF OF M	C	07/70

EXTRAMURAL ACTIVITIES- (MEMBERSHIPS, HONORS ETC.)

AMERICAN SOC FOR MICRO			1962
SCIENTIFIC RES. SOC OF AM			1965
PHI KAPPA PHI			1965
SIGMA XI			1965
AMER ASSN FOR ADV OF SCI			1965
AMER PUBLIC HLTH ASSN			1969
NY ACADEMY OF SCIENCE			1969
AM SOC TROPIC MED & HYGIENE			1969
AMER SOC MICRO	SUBCOMM ENTEROBACTE		1970-1968
AM ASSN VET LAB DIAG	SALMONELLA COMM		-1969
NATL COM CLIN LAB STD	SUBCOMM ENTEROBACTE		-1969
NATL REGISTRY OF MICRO	SPECIALIST MICRO		-1970

RESEARCH INTERESTS-

ANTIGENIC COMPOSITION OF CELL WALLS OF BACTERIA

MAYO GRADUATE SCHOOL FACULTY STATUS  
MAY 24, 1971

523 THOMPSON, JOHN HAROLD JR MAYO APPT. 01-01-1953 FACULTY RANK A3  
ACADEMIC RANK ASSOC PROF MED. FLD. PATH

SECTION ASSIGNMENT CL-PATH 36 M

DATE AND PLACE OF BIRTH 01-02-1921 AMSDEN, OHIO

COLLEGE/MEDICAL SCHOOL TRAINING WITH DEGREES AND INSTITUTIONS CONFERRING THEM

UNIVERSITY OF MINNESOTA	MINNEAPOLIS, MINNESOTA	PHD	PARA	-12/52
HEIDELBERG COLLEGE	TIFFIN, OHIO	AB		09/39-06/43
UNIVERSITY OF MICHIGAN	ANN ARBOR, MICHIGAN			06/41-09/41
UNIVERSITY OF MICHIGAN	ANN ARBOR, MICHIGAN			06/42-09/42
OHIO STATE U GRADUATE SCHOOL	COLUMBUS, OHIO	MS		09/46-06/48

RESIDENCIES

USA				01/43-09/46
FELLOW IN PARAS	MAYO GRADUATE SCHOOL			07/48-01/53

PROFESSIONAL PREPARATION / ACADEMIC EXPERIENCE

MAYO CLINIC	CONSULTANT IN PATH			01/53-07/54
MAYO GRADUATE SCHOOL	INSTRUCTOR IN PATH			07/54-07/62
MAYO GRADUATE SCHOOL	ASST PROF OF CL PATH			07/62-07/67
MAYO GRADUATE SCHOOL	ASSOC PROF OF CL PATH	C		07/67

BOARD CERTIFIED

SPECIALTIES M M M

EXTRA-MURAL ACTIVITIES (MEMBERSHIPS, HONORS ETC.)

SIGMA XI  
AMER SOC CL PATHOLOGISTS  
WILDLIFE DISEASE ASSN  
AMER FEDERATION CL RESEARCH  
AMER MICROSCOPICAL SOCIETY  
AMER ASSOC FOR HISTORY OF MED  
NEW YORK ACADEMY OF SCIENCES  
MINN SOC CL PATHOLOGISTS  
AMER SOC OF HEMATOLOGY  
AAAS  
AMERICAN ACAD OF MICROBIOLOGY FELLOW  
AMER SOC OF PARASITOLOGISTS

RESEARCH INTERESTS

BLOOD COAGULATION DEFECTS  
MEDICAL PARASITOLOGY

*Smed*

GRADUATE SCHOOL

AUG 13 1971

OFFICE OF THE DEAN

August 12, 1971

Professor Lewis D. Levang  
Department of English  
420 Humanities Building  
University of Minnesota--Duluth  
Duluth, Minnesota 55812

Dear Professor Levang:

This letter will confirm our telephone conversation about changes in graduate programs in English at Duluth. The central issue was the propriety of including certain "internal" related-fields courses on M.A. programs.

I have checked my records and am enclosing a copy of the appropriate sections from the minutes of the June 4, 1971 meeting of Language, Literature, and Arts Group Committee. You will note that this matter (a copy of the Duluth proposal is also enclosed) was discussed and approved at that meeting. Indeed, it was the feeling of our Committee that this matter was more an example of "courtesy information" from the English Department in Duluth than an item to be approved formally by our group. Your proposal, in short, merely ratifies at Duluth certain program changes which have been in effect for two years on the Minneapolis campus.

Please note that a minor change in the wording of your original proposal was recommended: read "English language" for "linguistics." This modification was suggested to ensure that there would be no confusion between a Departmental sub-field in the history of the English language, etc. and the graduate field of Linguistics as such.

I think that these enclosures and this letter should indicate that such programs conforming to these new guidelines are entirely legitimate and should be approved.

Please allow me to repeat my verbal commendation of the English Department at Duluth for its scrupulous review of student programs. This type of attention by your faculty not only benefits the students, but also eliminates such tedious red-tape.

Do not hesitate to contact me if our Committee can be of any other service to you.

Sincerely,

*Joe*

R. Joseph Schork  
Professor  
Chairman, LIA Group and P & R Committees

enclosure

cc: Dean Bryce Crawford, Jr.--The Graduate School (Minneapolis)  
Dean M. Harry Lease, Jr.--The Graduate School (Duluth)

jam

*Approved  
Version*

PROPOSED CHANGES IN THE M.A. (PLAN B) IN ENGLISH,  
UNIVERSITY OF MINNESOTA, DULUTH

1. To the list of prerequisites for the M.A. degree (Plan B) in English shall be added at least one upper division or graduate level course in the area of linguistics. A student who has not had such a course as an undergraduate must complete one as part of the requirements for the major.
  
2. A candidate for the M.A. degree (Plan B) in English may offer 6 to 12 graduate English Language credits in American literature or in ~~XXXXXXXXXX~~ to satisfy one related field requirement. He must offer 6 - 12 credits in at least one other related field outside the Department of English. Students choosing one related field within the Department cannot use courses from this field to meet the 21 - 27 credit requirement for the major.

These proposals have been recommended by the Department of English, Duluth Campus, through its graduate faculty, in meetings on February 3 and March 8, 1971.



1st proposal

PROPOSED CHANGES IN THE M.A. (PLAN B) IN ENGLISH,  
UNIVERSITY OF MINNESOTA, DULUTH

1. To the list of prerequisites for the M.A. degree (Plan B) in English shall be added at least one upper division or graduate level course in the area of linguistics. A student who has not had such a course as an undergraduate must complete one as part of the requirements for the major.
2. A candidate for the M.A. degree (Plan B) in English may offer 6 to 12 graduate credits in American literature or in linguistics to satisfy one related field requirement. He must offer 6 - 12 credits in at least one other related field outside the Department of English. Students choosing one related field within the Department cannot use courses from this field to meet the 21 - 27 credit requirement for the major.

These proposals have been recommended by the Department of English, Duluth Campus, through its graduate faculty, in meetings on February 3 and March 8, 1971.