

UNIVERSITY OF MINNESOTA
Graduate School

Minutes of the Executive Committee
Tuesday, December 8, 1964
11:30 A.M. Campus Club

Present: Professors J. R. Borchert, R. L. Hossfeld, C. P. Barnum, W. E. Ibele, R. L. Jones, D. W. Warner, A. A. Renaud, M. C. Reynolds, E. W. McDiarmid; Dr. Victor Johnson; Miss Ruth Chovancek by invitation; Deans F. M. Boddy, J. C. Haugland; Dean Bryce Crawford, Jr., presiding; Mrs. Shirley McDonald, Secretary.

1. Graduate School Student Records - Miss Ruth Chovancek, Graduate School Statistician, was invited to explain to the Executive Committee certain features of a new system involving records of students' progress which will improve services to the faculty, departments, and graduate students.
2. Grade-Point Average - Dean Crawford asked the Committee if all group committees had discussed the tentative action taken by the Executive Committee regarding the grade-point average (refer to Executive Committee minutes, October 21, 1964, Item 2). It was brought out, again, that the 2.8 grade-point average is a Graduate School minimum requirement for Master's programs and that individual group committees or departments may require a higher level of performance. With this understanding, the group committees do approve the action and this record re-affirms that action. Dean Crawford will prepare a statement describing the new requirement for a Graduate Faculty Newsletter which will be circulated by the opening of winter quarter, 1965.
3. Professional Improvement and Graduate Anomalies - Dean Crawford reported that an all-University committee, the Special Committee to Study Extension Activities, will produce a report in the near future. The Graduate School will prepare a summary of pertinent parts from that report for the Executive Committee. Any further discussion on graduate study through Extension will be deferred until that time.

On the question of part-time graduate study, the Dean asked the Executive Committee to discuss with the group committees the possibility of a requirement of a period of full-time study by Master's and Ph.D. candidates. He referred specifically to Items 4 and 5 in the Memorandum on Professional Improvement and Graduate Anomalies, dated July 16, 1964, which was circulated to the group committees earlier.

Professor McDiarmid asked about further development on the possibility of students going abroad -- perhaps for a year -- for language study. The student would still be under the supervision of his adviser at Minnesota. Could something of this nature be worked out through the CIC program? Dean Crawford said that this probably could be done independently if arrangements were made in advance and prior approval had been obtained by the student.

4. Use of the Preliminary and Final Oral Examinations - The possibility of a conference of all group committee members to exchange ideas, practices, and procedures on the use of the preliminary oral and final oral examinations and related subjects has been discussed within the group committees. They agreed, in general, that this kind of "seminar" might be useful. The Graduate School has checked facilities for the meetings and dates have been set for February 26 and 27, 1965. While the structure has not been determined, it has been suggested that small groups representing the different committees meet, coming together as a whole group several times during the conference.

A draft of suggested topics and questions which might be discussed during the conference was circulated to the Executive Committee. They were asked to edit, add to, or change this draft in any way they feel desirable in order to produce a second version before the January Executive Committee meeting. The Dean suggested that the group committees be aware of any practices, understandings, or pending developments on this subject in their own areas. Professor Barnum mentioned that it might be useful to know any unique procedures or features of examining procedures which exist in departments. Dean Boddy suggested that a list of departments who have prepared statements on procedures would be helpful.

Professor Reynolds asked what this conference would be expected to produce as a result of the meetings. Dean Crawford said that an exchange of ideas, philosophies, and present practices might be of benefit to the Graduate Faculty. The whole group may agree or reach a consensus on certain things which might be embodied in a "white paper." It was stated clearly that this conference would not issue a set of mandatory instructions but that useful guidelines might be brought forth in areas in which some consensus is found.

5. Proposed Ph.D. in Industrial Engineering - Professor Ibele reported that the general background, specific requirements, and typical Ph.D. programs for the proposed program have been reviewed and discussed by the Physical Sciences Group Committee and approval has been recommended.

The Executive Committee VOTED unanimously that the Ph.D. in Industrial Engineering be established.

6. Proposed Master of Architecture - Professor Ibele reported that copies of the proposed degree had been circulated to the Physical Sciences Group Committee, but that specific action had not been taken. Since there were several students interested, there seems to be some urgency in having action so that the proposal may go before the Regents at the December meeting. Professor Ibele agreed to poll each P.S.G.C. member and the Executive Committee moved to accept the judgment of that committee. This is recorded as a tentative action by the Graduate School Executive Committee.

Proposed Master of City Planning - This proposal has been sent to the Physical Sciences and Social Sciences Group Committees for study. An ad hoc committee is also being set up to review the proposal and to report as early as possible in winter quarter, 1965.

7. Foreign Language Requirement - The Executive Committee agreed, at an earlier meeting, that an ad hoc committee be appointed to study this requirement. Dean Crawford has received several suggestions for membership on this committee. Any other suggestions may be sent to Deans Crawford or Haugland.
8. Graduate School Policy Regarding Pursuit of Graduate Degrees by Faculty - Professor Barnum explained the circumstances leading to certain questions in respect to the policy. A faculty member functioning as a clinical professor has had 3 years of undergraduate college, medical school training, internship, and a residency assignment. It is understood that such a person has stature as a professional practitioner and is perfectly competent to teach in undergraduate medical-school courses and indeed in advanced professional programs. By virtue of all of this training, could not the general policy be relaxed even though he holds the rank of assistant professor?

The Dean commented briefly on the rationale for the existing policy. Tenure or potential tenure is implied for ranks above that of instructor. In addition, if a faculty member is working toward an advanced degree, his colleagues, who must judge his performance on examinations and approve his thesis, are placed in an awkward position.

Professors Ibele and Renaud spoke of instances in their areas of faculty who came to Minnesota already holding assistant and associate professorships who are given the title of lecturer. This title does carry status but has no tenure implications. Dean Crawford spoke of a titles such as Professor of Clinical Medicine, used at Rochester for a number of persons who teach and are eminent practitioners in their specialties but are not research oriented.

The Dean asked the Executive Committee to discuss this question with the group committees and bring back any thoughts or suggestions they may have. A portion of the minutes of the meeting of the Administrative Committee of the College of Medical Sciences for November 19, 1964, has been reproduced here for information purposes.

Dean Howard then turned the Committee's attention to Dr. D. W. Hastings' letter dated October 29, 1964, concerning the present policy of the Graduate School in regard to pursuit of advanced degrees by members of the faculty whose appointments are at the Assistant Professor level. (A copy of this letter was distributed to members of the Committee prior to this meeting). The present Graduate School policy precludes the pursuit and completion of advanced degrees by faculty members other than those holding appointments at the rank of Instructor. Dr. Hastings proposed that the Administrative Committee recommend to the Graduate School that this policy be modified to permit individuals whose appointments are at the Assistant Professor level to pursue

and receive graduate degrees. There then followed extensive discussion concerning this proposed recommendation. It was the general consensus that a relaxation of the present policy would be appropriate with respect to individuals already holding the M.D. degree, acquisition of which has taken a considerable period of time. Such individuals are most likely to be working toward the Ph.D. degree with a major in a clinical area, but some will also be found in the basic science departments pursuing degrees in those fields. After further discussion, Dr. C. J. Watson made a motion that it is the sense of the Administrative Committee that any Instructor holding the M.D. degree may be promoted to the rank of Assistant Professor without precluding his opportunity to pursue and complete work for an advanced degree in the Graduate School. This motion was passed with unanimous approval. Dr. G. T. Evans then made the following motion: that consideration be given to the establishment of a mechanism whereby other faculty members at the Assistant Professor level might, under unusual circumstances and on the basis of an appropriate appeal to the Medical Graduate-Group Committee and Graduate School, be eligible to pursue and receive graduate degrees. This motion received unanimous approval.

9. Report on the Meeting of the Subcommittee on Post-Baccalaureate Education -

Dean Crawford explained that representatives from the state and private colleges and the University of Minnesota have had several meetings over the past two years. Discussions have centered mainly about possible means for cooperative study and planning in higher education in Minnesota.

The Liaison Committee on Higher Education in Minnesota requested that this committee be reconstituted as the Subcommittee on Post-Baccalaureate Education.

The Liaison Committee and Subcommittee on Post-Baccalaureate Education can be of mutual benefit to one another in identifying, studying, and reporting on various problems in respect to advanced study in the state. Dean Bryce Crawford, Jr., was elected chairman and Dean Robert Keller secretary of the Subcommittee at the meeting on December 7, 1964. This committee will include 1 representative from each of the accredited four-year schools in the state (public and private) and 4 members from the University of Minnesota. The University members include Deans Bryce Crawford, Jr., Robert Keller, Thomas W. Chamberlin, and Rodney Briggs.

Three panels were established within the Subcommittee to concentrate on three special areas: (a) a Panel on Cooperative Programs for Faculty Development; (b) a Panel on Graduate Program Development; and (c) a panel on Fifth- and Sixth-Year Teacher Training Programs. Minutes of the December 7 meeting of the Subcommittee will be sent to the Executive Committee when they become available.

Professor McDiarmid suggested that cooperative effort might also be extended to the area of fellowship application information and assistance.

The date for the February Executive Committee is set for February 2, 1965.

Dec. 16, 1964

Respectfully submitted,
Shirley McDonald, secretary

INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING
MINNEAPOLIS, MINNESOTA 55455

August 10, 1964

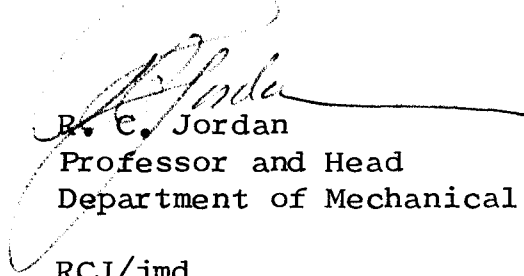
Dean Bryce Crawford, Jr.
Graduate School
321 Johnston Hall

Dear Dean Crawford:

Accompanying this letter you will find our proposal for the Ph.D. program in Industrial Engineering. I trust that this documentation is sufficient, but if further information is required I will be happy to provide it.

Mr. Lowell Nystrom's proposed Ph.D. program also accompanies this letter. In addition, the Graduate School is currently holding the Ph.D. program of Mr. Lele for consideration along with this document.

Sincerely yours,


R. C. Jordan
Professor and Head
Department of Mechanical Engineering

RCJ/jmd
Enclosures (2)

PROPOSED PH.D. PROGRAM IN INDUSTRIAL ENGINEERING

Industrial Engineering is one of the rapidly developing professional scientific fields encompassing a variety of expanding opportunities. The gamut runs from the building of probabilistic models to describe the laws and principles which will enable better predictions, decisions, and evaluations to the actual design of complicated operating systems. There are virtually an infinite number of unsolved problems in the areas of sequencing, optimal allocation, network theory, line balancing, search theory, and several other types of optimization problems. Many of the graduates of Industrial Engineering take positions which lead eventually to managerial activities at top corporation levels and this trend is rapidly increasing. In 1900 only 7½ percent of the leading corporation officials had degrees in science and engineering, in 1925 this had risen to 13 percent and in 1950 to 20 percent. Since then the trend has accelerated and the number is currently somewhat above 36 percent. This has now reached a point where the number of top executives with a technical background exceeds the combined percentages of those with business or with law degrees by a considerable margin (36 percent compared with 9 percent).

In a recent Harvard study of 6,000 executives 36 percent in the age range of 55 to 65 years were found to have degrees in science or engineering. More important a study of the 35 to 45 age group from which top management will be included in the next 20 years showed that 51 percent had degrees in science or engineering. Although only a portion of these will have undertaken undergraduate or graduate study in Industrial Engineering, the trend and need is evident. Such universities as Johns Hopkins, M.I.T., Columbia, Northwestern, Purdue, Case Institute of Technology and Stanford are among those which now offer the Ph.D. degree in Industrial Engineering.

Discussion of the Ph.D. Program in Industrial Engineering

The framework upon which we plan to build the Ph.D. program in Industrial Engineering involves course work in the major selected from those offerings in science and engineering particularly relevant to the field. Because it is necessary for each candidate to obtain a high level of analytical proficiency it will be required that each program include the following area course material:

- 1) Mathematical Statistics - one year sequence.

- 2) Advanced Mathematics - one year sequence.
(This will be required if the student does not Minor in Mathematics and will include such work as advanced calculus, linear algebra, group theory, vector analysis, determinants and matrices.)
- 3) Probability and stochastic Processes - one year sequence.
- 4) Operations Research - one year sequence.
- 5) Management - one year sequence.
- 6) Numerical Analysis and Computer Technology - one year sequence.

The minor for the Ph.D. in Industrial Engineering may be selected from several areas, dependent upon the thesis and the broad intent of the program. Virtually any one of the engineering disciplines may be used as a minor or the minor may be selected from such areas as mathematics, statistics, psychology, economics or management.

Faculty of the Industrial Engineering Division
of the Mechanical Engineering Department

The faculty in the industrial engineering area of the Mechanical Engineering Department who will be primarily concerned with this Ph.D. major consists of the following staff:

Professor Gayle W. McElrath - Professor McElrath holds full membership in the graduate faculty and has held the rank of Professor since 1958. He has also been guest professor at Marquette University, UCLA, Purdue and at Naval Ordnance, China Lake, California. He is Vice President of the American Society of Quality Control. During the last two years he has been guest lecturer at some 22 special conferences put on by such schools and organizations as the University of Illinois, the University of Wisconsin, State University of Iowa, American Society for Engineering Education, American Society of Quality Control, General Motors Institute, and the Operations Research Society. He has authored some 25 publications in the areas of significance tests, acceptance sampling, variability, and quality control and is co-author with Dr. Bernard Lindgren of the textbook Statistical Theory.

Assistant Professor Sant Ram Arora - Dr. Sant Ram Arora holds the rank of Assistant Professor and is an associate member of the graduate faculty. It is our intent to request full membership status on the graduate faculty for Dr. Arora during the coming academic year. Dr. Arora is a product of Johns Hopkins University with major interests in mathematics, statistics and operations research. His research and publications activities have been in the areas of optimal decision parameters with distribution functions not completely known, optimal inventory levels, cascade theory and inventory control.

Professor Katsuhiko Ogata - Dr. Ogata is a full member of the graduate faculty and has held the rank of full professor since 1961. He is a product of the University of Tokyo where he received his Bachelor of Science degree, the University of Illinois where he received his Master of Science degree, and the University of California where he received his doctorate. In addition to his teaching activities in Mechanical Engineering at Minnesota he held the rank of full professor of Electrical Engineering at Yokohama National University in the year 1960-61. His principal areas of activity have been in the servomechanism, automatic control and vibrations analysis fields, with recent accent on automation control equipment as applied to industrial engineering. During the past three years he has participated strongly in the industrial engineering activities of the department. His research and publication activities have been most strongly in the field of nonlinear feedback control systems and higher order servomechanisms and he is the author of a recent textbook on nonlinear feedback control published by McGraw Hill.

Russell S. Nyquist - Mr. Nyquist is completing his doctorate this summer and will hold the rank of assistant professor in the fall quarter. He has been a member of the faculty at Minnesota since 1958 with the rank of instructor and has held teaching status on the graduate faculty. In addition, he has had industrial experience with Green Giant Canning, Minnesota Mining, Toro Manufacturing and Abbott Hospital. The major for his doctorate is in the field of Production Management in School of Business Administration and he has been particularly interested in developing the analytical aspects of Industrial Engineering.

Ronald J. Mogavero - Dr. Mogavero will join our staff with the rank of assistant professor this fall. He is a product of the University of Buffalo, Washington University of St. Louis, and Northwestern University. His particular areas of graduate activity have been in decision theory, game theory, linear programming, dynamic programming, cueing theory, Markov processes, all in the area of operations research, and in engineering statistic, statistical quality control and production and inventory control. He has been employed in operations research at General Mills during the summer of 1962 and although heavily sought by other schools and by such industrial companies as General Mills he has regarded the possibilities at Minnesota as preferable.

It is our intent to request approval of Mogavero and Nyquist for the advising of Master's candidates. The Doctorate candidates will initially be advised by McElrath, Arora, and Ogata.

Sample Program Leading to Ph.D. in
Industrial Engineering

Two current programs have been or are being submitted for approval for the Ph.D. with a major in industrial engineering. These are for Mr. Prabodh Lele and for Mr. Lowell Nystrom and both accompany this letter.

Respectfully submitted,

R. C. Jordan
Professor and Head
Department of Mechanical Engineering