Faculty Senate Monthly Packet November 1978

Portland State University Faculty Senate

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The Senate will hold its regular meeting of the Faculty Senate on November 6, 1978, 3:00 p.m. in 150 Cramer Hall.

A. Roll

B. Approval of Minutes of the October 2, 1978 Meeting

C. Announcements and Communications from the Floor

D. Question Period
   1. Questions for Administrators
   2. Questions from the Floor for the Chair

E. Reports from Officers of Administration and Committees
   *1. Informational Report on Project Advance - Heath and Pierson
   2. Enrollment and Budget Prospects - Blumel

F. Unfinished Business - none

G. New Business
   *1. Curriculum Committee Program Proposals - Pollock
   *2. Graduate Council Program Proposals - Bentley

H. Adjournment

*The following documents are included with this mailing

Regarding Agenda Items:  B - Minutes of October 2, 1978 Meeting
                         E1 - Informational Report on Project Advance**
                         G1 - Curriculum Committee Program Proposals**
                         G2 - Graduate Council Program Proposals**

**Included for Senators and Ex-Officio Members only
Minutes: Faculty Senate Meeting, October 2, 1978
Presiding Officer: Elaine Limbaugh
Secretary: Earl Rees


Alternates Present: Perlstein for Barmack, Olmsted for Hashimoto, Lembke for Merrick, Westover for Newberry, Kosokoff for Sugarman, Hillman for Tinnin

Ex-Officio Members: Blumel, Corn, Dittmer, Forbes, Heath, Hoffmann, Howard, Petrie, Parker, Rauch, Rees, Richelle, Rodgers, Todd, Trudeau

APPROVAL OF MINUTES

In the first paragraph on page 2, item 2) "the degree will be issued as a joint degree by the participating institutions" should read "the degree will be issued by the University of Washington." In the last sentence on page 6, "loose" should read "lose." The minutes were approved as corrected.

ANNOUNCEMENTS AND COMMUNICATIONS FROM THE FLOOR

Presiding Officer:
1. Ron Cease was welcomed as parliamentarian.

2. The Koinonia House has invited faculty to meet for sherry at the end of the Senate meeting.

Newhall, reporting on collective bargaining developments at Portland State, pointed out that since the designation of the AAUP as the bargaining agent the local chapter of the AAUP has made changes in their constitution and organization and local dues have been raised. Negotiating teams for the faculty and administration have been selected. There are no paid negotiators on the faculty team and all members of the faculty have been asked to contribute to the negotiations which involve work on legally binding agreements. The negotiating teams have met to discuss ground rules for subsequent bargaining sessions. Newhall noted that Oregon law permits student participation but students are not party to the negotiations. Some students have attended negotiation meetings. The AAUP realizes the pressing need to develop a specialized model of collective bargaining in keeping with the standards of higher education and hopes that both faculty and administration maintain the spirit of collegiality and gain from the collective bargaining process.
Waller updated activities of the Interinstitutional Faculty Senate. The PSU senators are Hacik Erzurumlu, Alfred Sugarman, and Fred Waller. Two issues are of current concern. One is the revision of the Administrative Rules where a provision for faculty governance has been sought. Vice Chancellor Romney says the revisions have been submitted to the institutional executives for their comments. The last revisions will be sent to the entire IFS. Another matter is the establishment of a Faculty Lobbyist Office for the entire State System faculty. In general, the response to this idea has been favorable and the IFS is going ahead. Due to pending legislation, there seems to be more reason now than last winter to have a spokesman for the State System faculty at the next session of the legislature. Information concerning the lobbyist will be distributed within the next few weeks and faculty members will be asked to pledge financial support. As the IFS conceives the role, the faculty lobbyist will represent the faculty in the first instance, but activities need not be in conflict with any others being taken in behalf of the State System faculty. The lobbyist, whenever possible, should work in cooperation with other efforts. Waller said he would be grateful if a member of the Senate who is not a member of the IFS would serve with him as a member of what will become the Lobbyist Steering Committee.

QUESTION PERIOD


2. Questions from the Floor for the Chair - none.

REPORTS FROM OFFICERS OF ADMINISTRATION AND COMMITTEES

1. President Blumel reported on enrollment. At the end of the first week, fee payments were up about 1.7 percent over 1977. It is likely that this year's enrollment will equal last year's. Oregon State University expects to be the same as last year and Eastern Oregon State College is up slightly. OSU and PSU are at ceiling enrollment. Enrollment is down at the University of Oregon, Oregon Institute of Technology, Southern Oregon State College, and Oregon College of Education.

UNFINISHED BUSINESS

The Presiding Officer reminded the Senate that at the second reading an amendment is not open to modification but only debate and consideration of final passage.

1. Proposed Amendment to provide Senate representation for Instructional Faculty in Academic Schools, Colleges, and Instructional Units - Second Reading - Halley. Bates moved that the Senate adopt the amendment as included in the Senate mailing. (seconded)

Highlights of Discussion: Halley was unable to attend the Senate meeting. Bates read a memorandum from Halley concerning the Advisory Council's statement, as included in the Senate mailing, regarding the amendment. Halley's memorandum, in part, reads as follows: "The first suggestion can be covered by placing the word "appropriate" before 'Chief Administrative Officer' or by using the wording of Section 1, 2 - Vice President for Academic Affairs in line 7 of Section 2, 1. Neither change seems substantive to me. The second question regarding routing of names from the Elections
Committee to the Senate Steering Committee for unit placement and then back to the Elections Committee seems routine enough to present no real problem to either committee and any added wording prescribing actions for a faculty committee seems unneeded." The question arose as to whether the changes were editorial or substantive. Erzurumlu said the Advisory Council considered the changes to be substantive. Given the uncertainty as to the constitutional status of the proposed changes, they were withheld.

Action on Halley Amendment: Passed by voice vote.

NEW BUSINESS - none.

The meeting was adjourned at 3:50 p.m.
TO: Faculty Senate
FROM: Jim Heath and Roy Pierson
SUBJECT: Progress Report on PROJECT ADVANCE

At the November 1976 meeting, the Faculty Senate endorsed an experimental project by which PSU would collaborate with the North Clackamas School District #12 to allow selected able and gifted seniors to earn PSU credit for university equivalent courses given at their high school while they were completing high school graduation requirements. At that time, the President of the Senate asked the Educational Policies Committee to monitor the project and report to the Senate later in the year.

The Office of Academic Affairs presented a progress report regarding Project Advance to the Senate at the May 1977 meeting. The report stressed that the project operated under the following restraints: (1) all courses and instructors to be approved by the PSU departments involved; (2) enrollment to be limited to approximately 100 students per high school in participating districts; (3) instructional costs to be borne by the high schools; and (4) total enrollment in the program not to exceed 800 students. In response to the report, the Senate voted that "Project Advance should be continued for a second year with the North Clackamas School District and that other school districts which wish to participate be allowed to do so if they meet the standards established for the program."

In the Annual Report to the Senate at the June 1977 Senate meeting, the Educational Policies Committee added its endorsement of the project and recommended its continuation on an experimental basis--subject to close monitoring by the Office of Academic Affairs--"for a total of 3 but not more than 5 years." The EPC suggested that a final evaluation of Project Advance regarding the termination or extension be made at the end of the experimental period.

The program experienced modest growth during its second year. As described in a progress report presented to the Faculty Senate at its November 1977 meeting, 230 high school seniors enrolled in 8 Project Advance courses during fall term 1977 at 4 high schools (Clackamas, Milwaukie, and Putnam in the North Clackamas District and Tigard High School in the Tigard District). A slightly lower number of students, 224, participated in 9 Project Advance courses during spring term 1978 at 5 high schools (the four listed above, plus one class at Aloha High School in the Beaverton District).

This fall, Project Advance courses are being offered at the following high schools: Clackamas, Milwaukie, and Putnam in the North Clackamas District; Tigard; and Grant, Franklin, and Wilson in the Portland District. A total of 298 students are enrolled in Project Advance classes. A list of the courses offered at each school follows:

OVER
FALL TERM 1978 PROJECT ADVANCE COURSES

Total Number of Students Enrolled in All Classes at All Schools = 298

NORTH CLACKAMAS SCHOOL DISTRICT

Clackamas = 43 students
Ec 201 Principles of Econ
SSc 199 Arts and Ideas
Mth 101 Intro to College Math

Milwaukie = 78 students
Eng 101 Survey of English Lit (3 sections)
RL 201 2nd Year French

Putnam = 23 students
Mth 101 Intro to College Math
Mth 201 Calculus
RL 207 2nd Year Spanish
Wr 121 English Comp

Tigard = 62 students
SSc 199 American Cultural Background
Mth 101 Intro to College Math
Mth 200 Calculus

PORTLAND PUBLIC SCHOOLS

Wilson* = 56 students
3867 Psy 201 General Psychology (2 sections)
3869 Hst 199 Modern Europe

Franklin = 19 students
3880 Eng 101 Survey of English Lit

Grant = 17 students
3881 Eng 101 Survey of English Lit
3886 RL 201 2nd Year French

*Negotiations are in progress at Wilson for several more classes.
TO: The Faculty Senate
FROM: The University Curriculum Committee
SUBJECT: Curriculum Proposals: new programs and changes in existing programs

The Committee took the following action regarding two new program proposals:

Approved the academic content of the B.S. Degree in Computer Science (with the specific change noted below*) and Mechanical Engineering as an option in the Engineering and Applied Science B.S. Degree but expressed its concern that the implementation of these and similar professional programs may come at the expense of traditional liberal education. The allocation of future resources within the University must recognize the need for balance between traditional liberal arts and professional programs. (*For the B.S. Degree in Computer Science, the Committee recommends that the range of credits for the Approved Elective part of the program be specified instead of being listed as TBA--see page 3 of the proposal.)

The Committee approved the following changes in existing programs:

1. Theater Arts Undergraduate Program
2. Biology Undergraduate Program for major requirements only. The Committee deferred action on the Biology Teacher Education Program, since the Teacher Education Committee has not approved the changes.
3. Physics Undergraduate Program.
4. Business Administration Undergraduate Program.
5. Undergraduate Social Service Major with recommendation that since upper-division status is a requirement of admission into the program, the definition of "upper-division" should either be included in the description or reference made to the page of the catalog which contains such information.
6. Administration of Justice Undergraduate Program.

The Committee strongly recommends the following policy for future PSU catalogs: departments should specify all credits required of a major or secondary education program offered by the department, including those taken in other departments. At present, departments often specify a total which includes only those credits given by the department offering the major or secondary education program, then subsequently add a statement that "in addition a student must have a certain number of credits (or certain courses) offered by other departments in order to satisfy requirements for the major or secondary education program."

Next month the Committee will present its annual report and its recommendations regarding new courses and course changes to the Senate.

Respectfully submitted

Carl Pollock, Chairperson

Enclosures

Committee: Alma Bingham, Pat Christman, Lewis Curtis, Alice Lehman, Darrell Millner, Thomas Morris, Gwen Newborg, Rudi Nussbaum, Sam Oakland, Carl Pollock.

Consultants: James Heath, Mary Kinnick, Nancy Stuart.
Description of Proposed Program

1. Definition of Academic Area

   a. Define or describe the academic area or field of specialization with which the proposed program would be concerned.

      Computer Science.

   b. What subspecialties or areas of concentration would be emphasized during the initial years of the program?

      Programming fundamentals, foundations of Computer Science, software design, scientific programming, and business data processing.

   c. Are there other subspecialties the institution would anticipate adding or emphasizing as the program develops?

      Computer organization and design, and real time applications (control and monitoring of real time processes).

   d. Are there subspecialties that you intend to avoid, in developing the program?

      No.

   e. When will the program be operational, if approved?

      The program is now operational as B.S. in Mathematics--Option 2 (Computer Science Option). It would be operational as B.S. in Computer Science as of September 1979.

2. Department, College or School Responsible

   a. What department, College, or School would offer the proposed program?

      Mathematics Department, College of Science.

   b. Will the program involve a new or reorganized administrative unit within the institution?

      No. It is now being offered as the Computer Science Option by the Department of Mathematics and the proposed B.S. in Computer Science would continue to be given by the Department of Mathematics.
3. Objectives of the Program

a. What are the objectives of the program?

The first objective of this proposal is to give Computer Science graduates the degree credentials which are being demanded by employers. The University's objectives for such a degree program are to provide a strong undergraduate program in Computer Science. Students completing the program would be in a position to continue in graduate study, or to apply their knowledge and skills in the application of Computer Science to business, industry, government, and research. Qualified minority and female students would be encouraged to major in the program.

b. How will the institution determine how well the program meets these objectives? Identify specific post-approval monitoring procedures and outcome indicators to be used if the program is approved.

The institution will determine how well the program meets these objectives by the number of students attracted to the program. The department intends to evaluate the post graduation careers of its students in employment and/or graduate school by soliciting comments and recommendations.

c. How is the proposed program related to the mission and academic plan of the institution?

The proposed program will provide a strong course of study leading to a B.S. degree in Computer Science. This proposal focuses on the high and growing demand for Computer Science personnel from commerce and industry in PSU's distinctive urban environment and urban clientele.

d. What are the employment outlets and the employment opportunities for persons who would be prepared by the proposed program?

Business, industry, government, and schools in the Portland area provide a major employment outlet as well as the entire northwest region and the western part of this country. Organizations such as Bonneville Power Administration, Tektronix, Freightliner, the several banks who have their state headquarters in Portland, and many smaller companies have needs for Computer Science personnel.

4. Relationship of Proposed Program to Other Programs in the Institution

List the closely related programs and areas of strength currently available in the institution which would give important support to the proposed program.
The proposed program is a modification of the existing Computer Science option in the Mathematics program. Basically the new program has fewer Mathematics requirements and more Computer Science requirements than the Mathematics degree with the Computer Science option. The important point is that the degree from our new program would read "B.S. in Computer Science" as opposed to the "B.S. in Mathematics" from our present Computer Science option. We have lost many prospective students from PSU, who have inquired seeking a Computer Science bachelor's program, at exactly the point when we explain that our Computer Science option is a Mathematics degree.

The present programs in science, engineering, business administration, social science, urban studies, and environmental studies would provide support for the approved electives in the program.

5. Course of Study

a. Describe the proposed course of study.

Required Hours for the Degree

(i) Required Computer Science Courses----------27
(ii) Elective Computer Science Courses----------12
(iii) Required Mathematics Courses------------27-28
(iv) Approved Elective Program

TBA

TOTAL 66-67

(i) Required Computer Science Courses

The following core of courses is designed to give the student extensive programming experience in several languages, to give the student a solid foundation in the techniques used to solve the internal problems (systems) and the external problems (applications) of computer programming, and finally, to give the student "hands on" experience with a mini-computer:

Subject and (Course) Hours
Introduction to Computer Programming I,II,III
(Mth 250,251,252)-----------------------------9
Information Structures (Mth 352)--------------3
Algorithmic Languages and Compiler Design
(Mth 355,356)---------------------------------6
Systems Programming (Mth 410H, 410H)---------6
Invididual Programming Laboratory(Mth 410D)---3

TOTAL 27
(ii) Elective Computer Science Courses
Each student will be required to complete four courses from the list below in order to specialize further in a particular area, or to gain a broader knowledge of the field:

<table>
<thead>
<tr>
<th>Subject and Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced COBOL (Mth 410)</td>
<td>3</td>
</tr>
<tr>
<td>Intro to the Theory of Computation</td>
<td>9</td>
</tr>
<tr>
<td>(Mth 410, 410)</td>
<td></td>
</tr>
<tr>
<td>Symbolic Language Programming (New)</td>
<td>3</td>
</tr>
<tr>
<td>Data Base Management (New)</td>
<td>3</td>
</tr>
<tr>
<td>Data Structures (Mth 353)</td>
<td>3</td>
</tr>
<tr>
<td>Discrete Mathematics (Mth 351)</td>
<td>3</td>
</tr>
<tr>
<td>Computer Organization (New)</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL 12

(iii) Required Mathematics Courses
The following courses are essential to understand Computer Science courses and to introduce the student to fields of Mathematics that have computer applications:

<table>
<thead>
<tr>
<th>Subject and (Course)</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculus (Mth 200, 201, 202, 203 or Mth 204, 205, 206)</td>
<td>15-16</td>
</tr>
<tr>
<td>Differential Equations (Mth 321)</td>
<td>3</td>
</tr>
<tr>
<td>Intro to Algebraic Structures (Mth 341)</td>
<td>3</td>
</tr>
<tr>
<td>Intro to Numerical Calculus (Mth 358)</td>
<td>3</td>
</tr>
<tr>
<td>Intro to Statistical Theory (Mth 461)</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL 27-28

(iv) Approved Elective Program
The student is required to complete an approved elective program. The purpose is to let the student explore Computer Science related interests. The courses in the program may be chosen from offerings in Mathematics, Computer Science, or from related subjects outside the Department of Mathematics. In any case, the program must have the approval of the Computer Science Committee.

Appendix 'A' gives a sample 4-year program
Appendix 'B' is a BACHELOR'S DEGREE IN COMPUTER SCIENCE WORKSHEET which can be used to plan a program.
b. What elements of this course of study are presently in operation in the institution?

The bachelor's degree in Mathematics with Computer Science option has been in effect since 1968, with new courses being added on an almost yearly basis. Therefore all of the required Computer Science courses are in operation; six of the nine Computer Science electives are in operation (those with course numbers in paragraph 5a above); and all of the required Mathematics courses are in operation.

c. How many and which courses will need to be added to institutional offerings in support of the proposed program?

Three new courses would need to be authorized and developed: Symbolic Language Programming, Data Base Management, and Computer Organization. In addition, seven of the courses which would be needed are now offered periodically under Mth 410 numbers, and are scheduled to be submitted for discrete numbering.

6. Admission Requirements

a. Please list any requirements for admission to the program that are in addition to admission to the institution.

None.

b. Will any enrollment limitation be imposed? Please indicate the limitation and rationale therefor. How will those to be enrolled be selected if there are enrollment limitations?

No

7. Relationship of Proposed Program to Future Plans

a. Is the proposed program the first of several curricular steps the institution has in mind in reaching a long-term goal in this or a related field?

Yes

b. If so, what are the next steps to be, if the Board approves the program presently being proposed?

The next step is a masters degree program in Computer Science.
8. Accreditation of the Program

a. Is there an accrediting agency or professional society which has established standards in the area in which the proposed program lies? (Please give name.)

No.

b. If so, does the proposed program meet the accreditation standards? If it does not, in what particulars does it appear to be deficient? What steps would be required to qualify the program for accreditation?

Not applicable.

c. If the proposed program is a graduate program in which the institution offers an undergraduate program, is the undergraduate program fully accredited? If not, what would be required to qualify it for accreditation? What steps are being taken to achieve accreditation?

Not applicable.

9. Evidence of Need

a. What evidence does the institution have of need for the program?

This request is being made to modify the name of the degree because the market place is more responsive to the degree named B.S. in Computer Science and it also describes more closely the course of studies. The Department of Mathematics has had many inquiries from high school graduates hoping to pursue a computer science career, and from employed adults who are already working in the field who wish to get a formal education and a degree in Computer Science. Many undergraduates at Portland State University who are enrolled in the Computer Science courses have expressed a desire to get a B.S. in Computer Science. In this region Tektronix Corporation, Bonneville Power Administration, U.S. Corps of Engineers, telephone companies, and banks have indicated to the Department of Mathematics their desire for students with preparation as proposed in this program.

b. What is the estimated enrollment and the estimated number of graduates of the proposed program over the next five years? If the proposed program is an expansion of an existing one, give the enrollment in the existing program over the past five years.
Estimated Enrollment  70  85  100  115  125
Estimated Graduates  15  20  20  25  25

Using graduation check data and interpolating on the number of Mathematics majors for the past five years, there have been an average of about 60 Computer Science option majors for each of the past five years.

Is the proposed program intended primarily to provide another program option to students who are already being attracted to the institution, or is it anticipated that the proposed program will draw its clientele primarily from students who would not otherwise come to the institution were the proposed program not available there?

We anticipate that most of the students will come from the Computer Science option that now exists, but that it will attract new students as well who would not otherwise come to PSU.

c. Identify statewide and institutional service area manpower needs the proposed program would assist in filling.

The following data is taken from *Occupational Manpower Trends in the Portland Metropolitan Area, 1970-1980*, prepared by Research & Statistics Section, State of Oregon Employment Division, Department of Human Resources:

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Programmers</td>
<td>820</td>
<td>970</td>
<td>1000</td>
<td>1140</td>
</tr>
<tr>
<td>Systems Analysts</td>
<td>370</td>
<td>470</td>
<td>490</td>
<td>570</td>
</tr>
<tr>
<td>Other Computer Specialists</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>Totals</td>
<td>1260</td>
<td>1520</td>
<td>1580</td>
<td>1810</td>
</tr>
</tbody>
</table>

The above was prepared in 1974. A more recent estimate, according to Tom Lynch, Supervisor of All Labor Market Information Program of the Employment Division, lumps together programmers and systems analysts. On a yearly basis, there are 70 job openings for programmer-analysts in the state of Oregon, of which about 45 per year are in the greater Portland metropolitan area.

d. What evidence is there that there exists a regional or national need for additional qualified persons such as the proposed program would turn out?

Although not a universal requirement, a college degree is increasingly important for systems analysts and programmers—especially for those who work in scientific and technical research operations.

Programmers Outlook:
In 1974, about 200,000 persons—about three-fourths of them men—worked as computer programmers. Most were employed by manufacturing firms, banks and financial institutions, data processing service organizations, and government agencies.

Employment of programmers is expected to grow faster than the average for all occupations through the mid-1980's as computer usage expands, particularly in medical, educational, and data processing services.

Job opportunities will be best for systems programmers and applications programmers who have had some training in systems analysis.

Systems Analysts Outlook:
The problems systems analysts must solve range from monitoring nuclear fission in a powerplant to forecasting sales for an appliance manufacturing firm. Because the work is so varied and complex, most analysts specialize in either business or scientific and engineering applications.

About 115,000 persons—10 percent of them women—worked as systems analysts in 1974. Most worked in urban areas for manufacturing firms, wholesale and retail businesses, and data processing service organizations. In addition, large numbers worked for banks, insurance companies, and educational institutions.

Employment of systems analysts is expected to grow faster than the average for all occupations through the mid-1980's as computer usage expands, particularly in medical, educational, and data processing services. In addition to opportunities that will result from growth, some openings will occur as systems analysts advance to managerial positions or enter other occupations.

The demand for systems analysts is expected to increase as users become more familiar with computer capabilities and expect greater efficiency and performance from their data processing systems. Advances in hardware and computer programs will result in expanded computer applications in manufacturing and small businesses, and this too, will contribute to employment growth.

Overall, systems analysts earn more than twice as much as the average for all nonsupervisory workers in private industry, except farming.
e. Are there any other compelling reasons for offering the program?

In addition to the reasons given in paragraphs 3c, 3d, 4, 9a, 9c, and 9d above, Computer Science has become a discipline for study in its own right.

f. Identify any special interest in the program on the part of local or state groups (e.g., business, industry, agriculture, professional groups).

Tektronix has indicated to the Department of Mathematics an interest in the establishment of such a program. In addition the College Relations Director of Tektronix has indicated an indirect interest by inviting qualified Computer Science majors (presently our Mathematics majors with Computer Science option) to apply for participation in their intern-type work-study program.

g. Have any special provisions been made for making the complete program available for part-time or evening students?

The core courses for Mathematics major with Computer Science option program have been offered evenings on a rotating basis for a number of years and we will offer core courses (at least all the required courses) on a rotating basis in the evening so that a student can fulfill the Computer Science and Mathematics courses required for the degree by attending evening classes.

10. Similar Programs in the State

a. List any similar programs in the state.

PSU offers a B.S. program in Mathematics-Computer Science option. The University of Oregon and Oregon State University each offer a degree in Computer Science.

b. If similar programs are offered in other institutions in the state, what purpose will the proposed program serve? Is it intended to supplement, complement, or duplicate existing programs?

The proposed program is not a new one. It would only replace an existing one at PSU: B.S. program in Mathematics-Computer Science option. It will make a Computer Science program available to the many students in the metropolitan area who attend Portland State University because they find it impossible to attend another school for such reasons as finance, jobs, or family responsibilities. The proposed program is intended to replace and strengthen an existing program at PSU.
c. In what way, if any, will resources of any other institutions be utilized in the proposed program?

PSU presently uses the Control Data Computer at OSU. The use of this resource might increase if the proposed program is implemented.

11. Faculty

a. List present faculty who would be involved in offering the proposed program with pertinent information concerning their special qualifications for service in this area.


Robert L. Broussard, Professor of Mathematics. B.S., 1944, Ph.D., 1951, Louisiana State University. Numberical Analysis, Computer Languages.


Additional program strength is provided by Craig A. Magwire, Ph.D., former PSU Computer Center Director and by William L. Gilmore, M.A., and Vivienne H. Olson, M.S. who teach computer languages.

b. Estimate the number, rank and background of new faculty members that would need to be added to initiate the proposed program; that would be required in each of the first four years of the proposed programs' operation, assuming the program develops as anticipated in item 8b.

For the past four years the Department has offered Mth 200, 201, 202, 203, 204, 205, 206, 250, 251, 252, 321, 341, 352, 355, 356, 548, 461, plus, on the average, 25 credits of elective Computer Science courses (in addition to all the other courses offered to some 3500 students each quarter.) Present faculty are qualified to offer all the new proposed courses except one.

Consequently, the first year of the program (with minimal but adequate course offerings), the program can be initiated with .50 new FTE, under the assumptions
(i) student enrollment is no greater than in Fall 1977 and
(ii) faculty FTE is not reduced from the level of Fall 1978.

For the first four years .50 new faculty FTE would be needed each year. For fractional FTE, qualified practicing computer scientists can be hired from the scientific industrial and government community in the metropolitan area. When additional FTE has accrued to 1.00 the Department would hire a tenure-track full-time faculty member with evidence of accomplishment and a doctorate in Computer Science.

c. Estimate the number and type of support staff needed in each of the first four years of the program.

Since this program would constitute only a small fraction of the Mathematics Department in the first four years, according to the present formula for staffing departments with secretaries we would not be entitled to another secretary. (We now have two.)

12. Library

a. Describe in as objective terms as possible the adequacy of the library holdings that are relevant to the proposed program (e.g., if there is a recommended list of library materials issued by the American Library Association or some other responsible group, indicate to what extent the institution's library holdings meet the requirements of the recommended list).

Please see Appendix C, COLLECTION EVALUATION: COMPUTING SCIENCES.

b. How much, if any, additional library support will be required to bring the library to an adequate level for support of the proposed program?

$1,900 to $2,600.

c. How is it planned to acquire these library resources?

We would request the funds as additional to our regular budget, but receiving less than this amount is not critical. For some years, the major part of the Mathematics library budget has been spent in the several areas of pure mathematics. Until the Computer Science materials are sufficiently increased, a greater portion of the on-going Mathematics library budget can be used for this purpose. Dr. Rodgers also points out that there is an overlap with the Systems Science library budget in this area.
13. Facilities and Equipment

a. What special facilities in terms of buildings, laboratories, equipment are necessary to the offering of a quality program in the field and at the level of the proposed program?

A large scale computer system is necessary for a quality program because it provides the wide range of computer languages and software packages that are necessary for a thorough understanding of the various applications of computer science.

A minicomputer is necessary to provide the training in operating system characteristics, and compiler and assembler development techniques that cannot be conveniently accomplished on a large scale system. The Computer Center Director will not permit access by students to the operating system of the institution's large scale computer system.

b. What of these facilities does the institution presently have on hand?

The Harris 220 Computing System acquired by PSU in 1976 is a large scale computer system. The Mathematics Department has a NOVA 3/12 minicomputer for student use.

c. What facilities beyond those now on hand would be required in support of the program?

None

d. How does the institution propose these additional facilities and equipment shall be provided?

Not applicable.

14. Budgetary Impact

a. Please indicate the estimated cost of the program for the first four years of its operation, following the format found on P. 6 of this document.

See following page (P. 13).
### SUMMARY OF ESTIMATED ADDITIONAL COSTS FOR PROPOSED PROGRAM

#### Personnel

<table>
<thead>
<tr>
<th></th>
<th>First Year</th>
<th></th>
<th>Second Year</th>
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<th>Third Year</th>
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<th>Fourth Year</th>
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<tbody>
<tr>
<td></td>
<td>Amount</td>
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<td>FTE</td>
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<td>FTE</td>
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<td>FTE</td>
</tr>
<tr>
<td>a. Faculty</td>
<td>$8,000</td>
<td>.50</td>
<td>$20,000</td>
<td>1.00</td>
<td>$28,000</td>
<td>1.50</td>
<td>$38,000</td>
<td>2.00</td>
</tr>
<tr>
<td>b. Graduate Assistants</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
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<td>$</td>
<td>$</td>
</tr>
<tr>
<td>c. Support Personnel</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>d. Fellowships &amp; Scholarships</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>.50</td>
<td>$20,000</td>
<td>1.00</td>
<td>$28,000</td>
<td>1.50</td>
<td>$38,000</td>
<td>2.00</td>
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</table>

Percentage of Total from State Funds

<table>
<thead>
<tr>
<th></th>
<th>First Year</th>
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<th>Second Year</th>
<th></th>
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#### Other Resources

<table>
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<tr>
<th></th>
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<tr>
<td>a. Library</td>
<td>$2,500</td>
<td></td>
<td>$500</td>
<td></td>
<td>$500</td>
<td></td>
<td>$500</td>
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<tr>
<td>b. Supplies &amp; Services</td>
<td>$100</td>
<td></td>
<td>$100</td>
<td></td>
<td>$100</td>
<td></td>
<td>$100</td>
<td></td>
</tr>
<tr>
<td>c. Movable Equipment</td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
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</tr>
<tr>
<td>TOTAL</td>
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<td>$600</td>
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</table>

Percentage of Total from State Funds

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<tr>
<th></th>
<th>First Year</th>
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<th>Second Year</th>
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<th>Third Year</th>
<th></th>
<th>Fourth Year</th>
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<td>100 %</td>
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<td>100 %</td>
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#### Physical Facilities

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th>Amount</th>
<th></th>
<th>Amount</th>
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<tbody>
<tr>
<td>Construction of New Space or Major Renovation</td>
<td>$ -0-</td>
<td></td>
<td>$ -0-</td>
<td></td>
<td>$ -0-</td>
<td></td>
<td>$ -0-</td>
<td></td>
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</table>

Percentage of Cost from State Funds

<table>
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<tr>
<th></th>
<th>First Year</th>
<th></th>
<th>Second Year</th>
<th></th>
<th>Third Year</th>
<th></th>
<th>Fourth Year</th>
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<td></td>
<td>%</td>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
<td></td>
</tr>
</tbody>
</table>

GRAND TOTAL

|                      | $10,600    |          | $20,600     |          | $28,600    |          | $38,600     |          |

Percentage of Total from State Funds

<table>
<thead>
<tr>
<th></th>
<th>First Year</th>
<th></th>
<th>Second Year</th>
<th></th>
<th>Third Year</th>
<th></th>
<th>Fourth Year</th>
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</thead>
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<td>100 %</td>
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</table>

#### Source of Funds

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
<th></th>
<th>Amount</th>
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<th>Amount</th>
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<tbody>
<tr>
<td>a. State Funds--Going-Level Budget</td>
<td>$10,600</td>
<td></td>
<td>$20,600</td>
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<td>$28,600</td>
<td></td>
<td>$38,600</td>
<td></td>
</tr>
<tr>
<td>b. State Funds--Special Appropriation</td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>c. Federal Funds</td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>d. Other Grants</td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>e. Fees, sales, etc</td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>f. Other</td>
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<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
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</tr>
<tr>
<td>TOTAL</td>
<td>$10,600</td>
<td></td>
<td>$20,600</td>
<td></td>
<td>$28,600</td>
<td></td>
<td>$38,600</td>
<td></td>
</tr>
</tbody>
</table>

*Not adjusted for possible inflation.*
b. If a special legislative appropriation is required to launch the program (as shown in item 4b of the estimated budget), please provide a statement of the nature of the special budget request, the amount requested, and the reasons a special appropriation is needed. How does the institution plan to continue the program after the initial biennium?

Not applicable.

c. If federal or other grant funds are required to launch the program (items 4c and 4d), what does the institution propose to do with the program upon termination of the grant?

Not applicable.

d. Will the allocation of going-level budget funds in support of the proposed program have an adverse impact on any other institutional program? If so, which programs and in what ways?

No.

16. SEQUENCE OF ACTION

Approved by Library

Approved by Unit (i.e., Dept.) Curriculum Comm.

Approved by Dep. Head

Approved by College/School Curr. Comm

Approved by College/School Dean

Date 10/17/78
# Bachelor of Science in Computer Science

## Appendix A

## Sample 4-Year Program

### 1st Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mth 200-1-2</td>
<td>12</td>
</tr>
<tr>
<td>Mth 250-1-2</td>
<td>9</td>
</tr>
<tr>
<td>Wr 121</td>
<td>3</td>
</tr>
<tr>
<td>PE/HE</td>
<td>3</td>
</tr>
<tr>
<td>Social Science</td>
<td>9</td>
</tr>
<tr>
<td>Sci., not mth</td>
<td>9</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>48</strong></td>
</tr>
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</table>

### 2nd Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Mth 203</td>
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<tr>
<td>Mth 321</td>
<td>3</td>
</tr>
<tr>
<td>Mth 341</td>
<td>3</td>
</tr>
<tr>
<td>Mth 352</td>
<td>3</td>
</tr>
<tr>
<td>Mth 355-356</td>
<td>6</td>
</tr>
<tr>
<td>Ind Prog Lab</td>
<td>3</td>
</tr>
<tr>
<td>PE/HE</td>
<td>3</td>
</tr>
<tr>
<td>A &amp; L</td>
<td>9</td>
</tr>
<tr>
<td>Science, not mth</td>
<td>9</td>
</tr>
<tr>
<td>Electives</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>48</strong></td>
</tr>
</tbody>
</table>

### 3rd Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mth 358</td>
<td>3</td>
</tr>
<tr>
<td>Mth 461</td>
<td>3</td>
</tr>
<tr>
<td>Systems Prog</td>
<td>6</td>
</tr>
<tr>
<td>Computer Sci. Elec.</td>
<td>3</td>
</tr>
<tr>
<td>A &amp; L*</td>
<td>9</td>
</tr>
<tr>
<td>Wr 323</td>
<td>2</td>
</tr>
<tr>
<td>Electives</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

### 4th Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Sci. Elec.</td>
<td>9</td>
</tr>
<tr>
<td>Social Science*</td>
<td>9</td>
</tr>
<tr>
<td>Electives</td>
<td>27</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

*At least 9 of these 18 credits must be upper division.*
APPENDIX B

BACHELOR'S DEGREE IN COMPUTER SCIENCE WORKSHEET

Name ___________________________ ID# ___________________ Date __________

Address ____________________________________________________ Phone __________

1. Wr 121___ Wr 323___ (6)

2. PE___ PE___ PE___ PE___ PE___ HE___ (6)

3. Non-Major Requirements:
   Three Combinations Outside the Mathematics Department (may be LD or UD):
   A & L_______ ______ Soc Sc______ _________
   Science (NOT Mathematics)______ _________ (27)
   Additional credits outside the College of Science (9 must be UD credits)
   A & L_______ ______ Soc Sc______ _________ (18)
   Science: (May be LD or UD but NOT mathematics)______ ______ (9)

4. Computer Science Major Requirements:
   200/204____201/205____202/206____203____321____341____
   250____251____252____352____ 355____356____358____461____
   Syst Pr____ Ind Prog Lab____ (55-54)
   Plus four courses chosen from Adv COBOL____ Intro Thy Compu I____
   II____III____Symb Lang Prog____ Data Base Mgmt____353____
   351____Compu Org____ (12)

5. Elective Program (Approved by the C.S. Committee).

______________________________________________________________

6. Free Electives: (Additional credits to total 186 together with those credits above. Of the 186 total credits, at least 62 must be UD.)

______________________________________________________________

______________________________

Total (186)
APPENDIX C
COLLECTION EVALUATION: COMPUTING SCIENCES

Introduction. This cursory survey of library resources on computer science is limited in scope. The following related fields of interest are omitted: engineering (e.g., computer design, electronics), business (e.g., computer industry, manufacture) and systems science (e.g., cybernetics, operations research). Moreover, the collection was surveyed primarily in regard to its adequacy for an undergraduate program. Accordingly, strict limits were placed on collection evaluation. For example, the list of journals searched is very selective, including no titles in foreign languages. Serial selections were made by the Science Librarian; the list reviewed and added to by Dr. J. Hein of the Mathematics Department. The framework for this survey is the excellent reference guide by C. Carter: "Guide to Reference Sources in the Computer Sciences" (1974).

Journals. A rather generous (given the above restrictions) number of journals were searched (38 titles). Of these, the library lacks fifteen; however, eleven are publications of Special Interest Groups (SIG's) of the Association for Computing Machinery (ACM). (There are more than twelve SIG publications; however, the list was reduced to only those considered appropriate for an undergraduate program.) The SIG's publish a broad spectrum of bulletins, newsletters, and slim magazines, individual numbers ranging from twelve to over a hundred pages. The ACM is the senior professional society of the world-wide computing community. As such its publications and those of its SIG's should receive top priority in any acquisition policy for the computing sciences:

SIGACT, Automata and Computability Theory, SIGACT News (q), $7.50
SIGBDP, Business Data Processing, Data Base (q), $10
SIGCAS, Computers and Society, Computers and Society (q), $7.50
SIGCOMM, Data Communication, Computer Communication Review (q), $8
SIGCSE, Computer Science Education, SIGCSE Bulletin (q), $12
SIGGRAPH, Computer Graphics, Computer Graphics (q), $20
SIGMAP, Mathematical Programming, SIGMAP Newsletter (q), $4
SIGMICRO, Microprogramming, SIGMICRO Newsletter (q), $10
SIGOPS, Operating Systems, Operating Systems Review (q), $4
SIGPLAN, Programming Languages, SIGPLAN Notices (m), $25
SIGSAM, Symbolic and Algebraic Manipulation, SIGSAM Bulletin (q), $10
Three journals published commercially should also be added to a want list in the following order of priority:

Software - Practice and Experience (q); Publisher: John Wiley & Sons, Ltd., First published: 1971. Subscriptions ca. $13.00/yr. by sea mail.

Honeywell Computer Journal (q); Publisher: Honeywell Information Systems. First published: 1967. Subscriptions: $8.00/yr.


Finally, we should get on the mailing list for:

Digital Computer Newsletter (q); Publisher: Office of Naval Research, Information Systems Branch. First published: 1949. Subscriptions: NTIS.

Note: Prices given above are 1974-75 prices.

Bibliographies and Bibliographic Aids. A small to medium-sized academic library serving an undergraduate to low-level graduate program in computers and data processing should be able to function comprehensively and efficiently with the following: Computer and Control Abstracts, Computing Reviews (plus its permuted indexes), Quarterly Bibliography of Computer and Data Processing and SIGPLAN Notices. In addition to the SIGPLAN Notices (recommended above) a major omission in our collection is a complete set of permuted indexes for our collection of Computing Reviews. Considered as a set, these indexes provide an unmatched entry to the best of the computing sciences literature; in fact, they are virtually indispensable. The following permuted indexes are lacking:


Comprehensive Bibliography of Computing Literature: Permuted and Subject Index to Computing Reviews. 1967. Aaron Finerman and Lee Revens, eds. x + 175p., $25

Bibliography and Subject Index of Current Computing Literature. 1968. Aaron Finerman and Lee Revens, eds. x + 176p., $25

Bibliography and Subject Index of Computing Literature. 1971 200p., $25

Bibliography and Subject Index of Computing Literature. 1972 200p., $25
The items listed above and any later issues should be given top priority for acquisition and a standing order placed for all future volumes in this series.

The Library owns most of the important supporting abstracts and indexes (e.g. Science Citation Index, Mathematical Reviews, Engineering Index, etc.). In addition, PSU has the two classic retrospective bibliographies compiled by Youdin (Computer Literature Bibliography, 1946 to 1963 (National Bureau of Standards. Misc. Publ. 266) and Computer Literature Bibliography, Volume 2, 1964-1967 (National Bureau of Standards. Misc. Publ. 309)) as well as the important International Computer Bibliography of the National Computing Center and Nederlands Studiecentrum voor Administratieve Automatisering. In addition we own several important bibliographies of more limited scope (e.g. KWIC Index; a Bibliography of Computer Management).


(In late 1969 ANSI Committee X3 began work on a dictionary: American National Information Processing Dictionary. We should acquire this item also if it is now in print.)


Handbooks and Manuals. This section does not include manuals on specific kinds of hardware (i.e. specifications, equipment, supplies and services) with the following exception:


The Digest is designed for quick comparison, in considerable detail, of the specifications and capabilities of digital computers from the largest American Manufacturers. All hardware models are compared according to
configuration rentals, hardware, software characteristics, system performance, and purchase prices. For this function it is unique and unequaled. It should be considered for acquisition.

Among the general computer science handbooks the library runs the Digital Computer User's Handbook, an indispensable item for a core collection. We also own the monumental, Handbook of Data Processing Management (6 vols.). We should certainly complete our holdings of the Handbook for Automatic Computation by acquiring:

vol. I/Part 6: Translation of ALGOL 60 (Die Grundlehren..., vol. 137)

There are many other manuals & handbooks available. Most of these are, however, dated given the rapid development of computer science.

Encyclopedias/annual reviews/surveys. By far the most recent and comprehensive work in this area is already being received by the library. The Encyclopedia of Computer Science and Technology when complete will total over 10,000 pages in 15 volumes. The intent of the authors is to create a compendium of the basic knowledge in the field of computer science. We also own Samuels' truly encyclopedic work, Programming Languages: History and Fundamentals, the bulk of which is devoted to detailed descriptions of more than 120 programming languages and/or systems. Several less comprehensive, but useful, works are in the collection as well (e.g. Condensed Computer Encyclopedia). Knuth's The Art of Computer Programming (3 vols. publ. thus far) has been stolen/lost. A second copy was ordered and received, albeit a third copy of this popular encyclopedia-like work would be useful in the reserve library or reference collection (ca. $60.00). The library subscribes to all the important annual reviews (e.g. Advances in Computers).

Conference Literature. The most fundamental literature in computer science, as in other scientific/engineering fields, emerges through the publication activity of professional societies. Among the major activities of these societies are technical conferences, the results of which are published as proceedings volumes. Together with the core journals they comprise the cream of the computer science literature. Unfortunately, our collection is poor in this respect; that is, we hold virtually none of the proceedings of the two most important computer-science societies (Association of Computing Machinery (ACM) and American Federation of Information Processing Societies (AFIPS)).

The following is a selected list of recommended acquisitions from the ACM and AFIPS. All are to proceedings published within the last five years. More recent publications than those listed below should also be purchased and a standing order placed for future offerings.

American Federation of Information Processing Societies (AFIPS)

Association for Computing Machinery (ACM)


1973, August 27-29, Atlanta: 28th annual

Symposia on Operating Systems Principles:

1971, October 16-20, Palo Alto: 3rd, sponsored by SIGOPS. Published in Operating Systems Review 6, $5.

1973, October 15-17, Yorktown Heights, N.Y.: 4th, sponsored by SIGOPS, sold through ACM

Symposia on Theory of Computing:

1971, May 3-5, Shaker Heights, Ohio: 3rd annual, Proceedings, $10 from ACM
1972, May 1-3, Denver: 4th annual, Proceedings, $12 from ACM

1973, April 30-May 2, Austin, Texas: 5th annual, Proceedings, $12 from ACM

Symposia on Applications of Computers to the Problems of Urban Society:


Symposia Sponsored by the Special Interest Group on Programming Languages (SIGPLAN):

1971, February 25-27, Gainesville, Fla.: Symposium on Data Structures in Programming Languages, $10 from ACM

1971, September 6-8, Grenoble, France: International Symposium on Extensible Languages, proceedings published in SIGPLAN Notices 6, 9 (October 1971), $5 from ACM.

1972, January 6-7, Las Cruces, N.M.: Conference on Proving Assertions About Programs, $10 from ACM

1972, October 5-6, Los Alamos, N.M.: Symposium on Two-Dimensional Man-Machine Communication, published in SIGPLAN Notices 7, 6 (October 1972), $9.50 from ACM
Symposia on Symbolic and Algebraic Manipulation:

1971, March 23-25, Los Angeles: 2nd, sponsored by SIGSAM, $15 from ACM

Workshops on Microprogramming:

1971, September 13-14, Santa Cruz, Calif.: 4th annual, preprints available from ACM $10.

1972, September 25-26, Urbana, Ill.: 5th annual, sponsored by SIGMICRO, $15 from ACM.

1973, September 24-25, College Park, Md.: 6th annual, sponsored by SIGMICRO

International Computing Symposia:


Symposia on Education in Computer Science:

1970, November 16, Houston: Technical Symposium on Academic Education in Computer Science, $5 from ACM.


Workshops on Data Description, Access and Control:


1971, November 11-12, San Diego: Sponsored by Special Interest Group on File Description and Translation (SIGFIDET), $9 from ACM

1972, November 29-December 1, Denver: Sponsored by SIGFIDET, $20 from ACM

Conferences and Symposia Sponsored Jointly with Other Professional Organizations:

1971, April 1-2, College Park, Md.: Symposium on Information Storage and Retrieval, sponsored by ACM, ACM/SIGIR, NASA, and University of Maryland. Order from the University's Conference and Institutes Division at $9.25.

1973, June 19-20, Gaithersburg, Md.: Conference on Simulation of Computer Systems, jointly sponsored with National Bureau of Standards and cosponsored by ACM's SIGSIM.

Note: Many of the above proceedings are published as numbers within SIG bulletins, etc. (see section on Journals above). Subscription to these SIG bulletins, etc. will, therefore, automatically pick up many of these to be published.

Institute of Electrical and Electronics Engineers (IEEE)

IEEE Computer Group/Society:

Annual International Computer Conference


1972, September 12-14, San Francisco: Compcon '72, "Innovation and Change in Computer Design."

International Symposia on Fault-Tolerant Computing:


1972, June 19-21, Boston: 2nd, in cooperation with MIT, proceedings, $15

1973, June 20-22, Palo Alto: 3rd, cosponsored with Stanford University Digital Systems Laboratory.

Miscellaneous Relevant Conferences and Symposia:

1971, March: Computer controlled instrumentation—methods and applications, Digest, 68p., $7.50 from IEEE/CS

1971, April: Symposium on programming and machine organization, Proceedings, 85p., $7.50 from IEEE/CS.

1971, June: Tutorial Symposium on LSI Memory, Proceedings, 48p., $5 from IEEE/CS.

1971, October 6-8, Columbia, Mo.: Two-Dimensional Digital Processing Conference, sponsored by University of Missouri-Columbia (Dept. of Electrical Engineering), in cooperation with Atlantic Richfield Co., Proceedings, 345p., $17.50 from IEEE/CS.

1972, April 12: Symposium on optical computing, Digest, 54p., $7.50 from IEEE/CS.
Monographs. Neither a formal search of monographic resources nor a determination of the size of the monographic literature were made. The estimates are, therefore, very tentative and based on an intuitive "feel" for the size of the literature and anticipated needs of an undergraduate program. If a more rigorous statement is required, then Choice should be searched for books on computer science and matched against our holdings. This will be done in any case, but could not be completed within the time frame given to complete this statement of needs.

As part of an evaluation of the Mathematics collection, (June, 1975) a search of Books for College Libraries showed that our Computer Science holdings are 65% complete. Because Books for College Libraries is oriented toward undergraduate instruction and is very selective, the 65% estimate is probably reasonably good for the kind of program being proposed.

Compiled by J. J. Kitchin, Science Librarian
9 March 1977
*FINANCIAL SUMMARY: BASIC COLLECTION
IN COMPUTER SCIENCE

Start-up costs.

Journals (assumes no backset purchases)..................................$ 250
Bibliographies and bibliographic aids (costs not listed above and frequency of publication est.)..............$ 300
Dictionaries/glossaries/thesauri..............................................$ 100
Handbooks/manuals...............................................................$ 125
Encyclopedias............................................................................$ 85
Conference literature (costs not listed above and frequency of publication est.).................................$ 1200
Books (est. cost $20-25/vol. for 20-25 bks.).................................$ 500

* Total: $ 2560 est.

Continuing costs. Minimum Maximum

Journals (assumes no new subscriptions after start-up)..................................................$250 -
Conference literature (frequency of publication est., assumes no new subscriptions after start-up). $150 -
Books (est. cost $20-25/vol. for 10-20 bks./yr.).................................$200 $500

* Total: $600 $900

*Note: Start-up costs can be reduced if we elect not to subscribe to the Computer Characteristics Digest ($75.00/yr.) or the International Journal of Computer and Information Science ($30.00/yr.). We could also go back only 2 or 3 years instead of 5 years to acquire conference proceedings backruns (est. $400). Therefore, total minimum start-up costs equal ca. $2000. In this case continuing costs would be ca. $500 to $800. These are "bare bone" estimates that assume we will receive regular inflation adjustments and can find money for future handbooks, manuals, encyclopedias, etc. outside the computer science budget.

Revised 1 Aug. 1978
PROPOSAL FOR NEW PROGRAM

PROPOSAL FOR THE INITIATION OF A NEW INSTRUCTIONAL PROGRAM LEADING TO THE B.S. DEGREE IN MECHANICAL ENGINEERING AS AN OPTION IN ENGINEERING AND APPLIED SCIENCE.

Description of Proposed Program

1. Definition of Academic Area

a. Define or describe the academic area or field of specialization with which the proposed program would be concerned.

The proposed program would be concerned with the professional preparation of Mechanical Engineers, as an option within the Department of Engineering and Applied Science. Mechanical Engineering requires basic study in the sciences (Physics and Chemistry) and Mathematics, in the engineering sciences, and in analysis and design as applied to mechanical components and mechanical systems. Thus, the proposed program is a logical extension of the currently offered Mechanical Engineering emphasis within the Applied Science option.

b. What subspecialties or areas of concentration would be emphasized during the initial years of the program?

Mechanical Engineering Design.

c. Are there other subspecialties the institution would anticipate adding or emphasizing as the program develops?

It is anticipated that the program will retain Design as its main emphasis throughout the foreseeable future.

d. Are there subspecialties that you intend to avoid, in developing the program?

Since the emphasis is to be Design, development of the area of Analysis will be primarily in support of the Design function, rather than being developed as a sub-specialty.

e. When will the program be operational, if approved?

Immediately. Mechanical Engineering is now approved as an emphasis in the Applied Science option.

2. Department, College, or School Responsible

a. What Department, College, or School would offer the proposed program?

Department of Engineering and Applied Science, College of Science

b. Will the program involve a new or reorganized administrative unit within the institution?

No.
3. Objectives of the Program

a. What are the objectives of the program?

The proposed Mechanical Engineering Program option has several objectives as follows:

(i) To provide the student with a well rounded basic education in Engineering related to analysis and design of mechanical components and systems.
(ii) To offer the opportunity for students in the upper division to develop their professional interests through program emphasis in the fundamental principles of engineering design.
(iii) To provide individual students program flexibility through the method of course electives in the upper division.
(iv) To prepare graduates for professional careers in government or private industry.
(v) To provide persons employed by Portland area industries, government agencies and consulting firms an opportunity to obtain a professional education in Mechanical Engineering while remaining employed.
(vi) To provide graduates with the appropriate basic preparation for further study in advanced professional degree programs.

b. How will the institution determine how well the program meets these objectives? Identify specific post-approval monitoring procedures and outcome indicators to be used if the program is approved.

The proposed program will be submitted for review and accreditation to the Engineers' Council for Professional Development (ECPD). This Council is the nationally recognized accreditation authority in this field. Once accredited, programs are automatically subject to continued periodic review by ECPD to maintain standards of program acceptability within the profession.

c. How is the proposed program related to the mission and academic plan of the institution?

The proposed program is intended to respond to the demonstrated student educational need and the needs of the Portland Metropolitan area in this field. It is therefore consistent with the University mission in meeting these needs.

d. If it seems pertinent to the subject area in question, what are the employment outlets and the employment opportunities for persons who would be prepared by the proposed program?

The recent report of the College Placement Council (August 1977) showed that students in programs leading to bachelor degrees in Engineering receive in excess of 50% of all job offers extended at the bachelor's level. The Portland metropolitan area, as a center of manufacturing industry, offers excellent employment opportunities for mechanical engineering graduates.

4. Relationship of Proposed Program to Other Programs in the Institution

List the closely related programs and areas of strength currently available in the institution which would give important support to the proposed program.
The proposed program draws heavily on support from:

Physics Department
Mathematics Department
Chemistry Department

This support is drawn to the same extent as that for the currently offered Applied Science Option. The Structural Engineering Option and the Electrical-Electronics Engineering Option currently offered in this Department draw similar support from these programs. Also, support will be drawn from the common engineering core courses currently offered in the Department of Engineering and Applied Science.

5. Course of Study

a. Describe the proposed course of study.

The proposed course of study consists of the essential elements required by the Engineers' Council for Professional Development (ECPD), which is the recognized accrediting body for engineering programs. These elements consist of approximately two and one half years of study in the area of mathematics, science and engineering, and the equivalent of one half year as the minimum content in the area of humanities and social sciences. Further requirements by ECPD are that the course work should include at least one half year of mathematics beyond trigonometry plus one half year of basic sciences, one year of engineering sciences and one half year of engineering design.

In addition to the elements listed above, the program is designed to have an emphasis in Mechanical Engineering Design, this being specifically a response to the prevailing needs of the job market in the Portland metropolitan area.

All courses included in the proposed program are currently offered in the Department of Engineering and Applied Science, and may be selected by students wishing to pursue the mechanical engineering emphasis within the Applied Science Option.

The proposed program offering is listed in Table I (page 4) and is shown graphically in Table II (page 6). Inspection of the program shows that it complies with existing university requirement regarding credits, distribution requirements, etc.

b. What elements of this course of study are presently in operation in the Institution?

All of them as the Mechanical Engineering Emphasis in the Applied Science Option.

c. How many and which courses will need to be added to institutional offerings in support of the proposed program?

None.
TABLE I

Proposed Mechanical Engineering Program Option

In addition to meeting the general University requirements, the major in engineering and applied science must meet departmental requirements.

An engineering and applied science major must complete the common core curriculum, supplemented by the required and elective engineering courses for the chosen option as described below:

A. Engineering and Applied Science Core Curriculum

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASE 115 Engineering Graphics</td>
<td>3</td>
</tr>
<tr>
<td>ASE 111,112 Engineering Concepts and Problems</td>
<td>6</td>
</tr>
<tr>
<td>Mth 200,201,202 Calculus</td>
<td>12</td>
</tr>
<tr>
<td>Ch 201,202,203 Chem for Engineering Majors or equivalent</td>
<td>12</td>
</tr>
<tr>
<td>Ph 207 Physics for Students of Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Ph 204 Physics Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>Wr 121 English Composition</td>
<td>3</td>
</tr>
<tr>
<td>Arts &amp; Letters or Social Science</td>
<td>6</td>
</tr>
<tr>
<td>Health or Physical Education</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>49</strong></td>
</tr>
</tbody>
</table>

Sophomore Year

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASE 211 Statics</td>
<td>4</td>
</tr>
<tr>
<td>ASE 212 Strength of Materials</td>
<td>4</td>
</tr>
<tr>
<td>ASE 213 Properties of Materials</td>
<td>4</td>
</tr>
<tr>
<td>Ph 208,209 Physics for Students of Engineering</td>
<td>6</td>
</tr>
<tr>
<td>Ph 205,206 Physics Lab</td>
<td>2</td>
</tr>
<tr>
<td>Mth 203 Calculus</td>
<td>4</td>
</tr>
<tr>
<td>Mth 321 Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>Approved upper division math</td>
<td>3</td>
</tr>
<tr>
<td>Approved engineering courses</td>
<td>6-12</td>
</tr>
<tr>
<td>Arts &amp; Letters or Social Science</td>
<td>6</td>
</tr>
<tr>
<td>Health or Physical Education</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45-51</strong></td>
</tr>
</tbody>
</table>

Junior Year

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASE 311 Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>ASE 321,322 Engineering Thermodynamics</td>
<td>6</td>
</tr>
<tr>
<td>ASE 354 Fundamentals of D-C Electrical Circuits</td>
<td>3</td>
</tr>
<tr>
<td>ASE 355 Fundamentals of A-C Electrical Circuits</td>
<td>3</td>
</tr>
<tr>
<td>ASE 356 Principles of Electromagnetic Energy Conversion</td>
<td>3</td>
</tr>
<tr>
<td>Wr 323 English Composition</td>
<td>3</td>
</tr>
<tr>
<td>Approved upper division math</td>
<td>3</td>
</tr>
<tr>
<td>Approved engineering courses or science electives</td>
<td>6-9</td>
</tr>
<tr>
<td>++Approved science electives</td>
<td>6-3</td>
</tr>
<tr>
<td>Arts &amp; Letters or Social Science</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
</tr>
</tbody>
</table>

++3 credits of Physics in Engineering Metallurgy (Ph 381) required for mechanical engineering option.
Senior Year

Ec 328 Engineering Economics 3
Approved engineering courses or science electives 33
Arts & Letters or Social Science 15

Total 51

In addition to the core curriculum, the major must also complete the following:

B. Proposed Mechanical Engineering Option

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASE 241 Mtls. &amp; Processes in Mfg.</td>
<td>3</td>
</tr>
<tr>
<td>ASE 313 Engineering Vibrations</td>
<td>3</td>
</tr>
<tr>
<td>ASE 314 Kinematics of Machine Elements</td>
<td>3</td>
</tr>
<tr>
<td>ASE 323 Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>ASE 381 Elementary Structural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ASE 382 Indeterminate Structures I</td>
<td>3</td>
</tr>
<tr>
<td>ASE 405 Reading &amp; Conference - Design Project</td>
<td>3</td>
</tr>
<tr>
<td>ASE 407 Seminar</td>
<td>1,1,1</td>
</tr>
<tr>
<td>ASE 461 Fluid Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>ASE 491,492,493 Mechanical Analysis &amp; Design</td>
<td>4,4,4</td>
</tr>
<tr>
<td>ASE 495 Engineering Measurement &amp; Instrumentation Systems</td>
<td></td>
</tr>
<tr>
<td>ASE 496 Topics in Fluid Systems Design</td>
<td>4</td>
</tr>
<tr>
<td>ASE 497 Topics in Mechanical Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>ASE 498 Topics in Thermal Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>ASE 499 Topics in Machine Design</td>
<td>3</td>
</tr>
</tbody>
</table>

Approved Electives - Mechanical Engineering

| ASE 116,117 Engineering Graphics | 3,3 |
| ASE 242,243 Mtls. & Processes in Mfg. | 3,3 |
| ASE 312 Advanced Dynamics | 3 |
| ASE 383 Indeterminate Structures II | 3 |
| ASE 411,413 Science of Materials | 3,3 |
| ASE 424 Laser Principles and Applications | 3 |
| ASE 431 Transfer & Rate Processes | 3 |
| ASE 441,442,443 Systems Analysis & Synthesis | 3,3,3 |
| ASE 444 Engineering Project Management | 3 |
| ASE 447,448,449 Systems Analysis Computer Lab | 1,1,1 |
| ASE 451,452,453 Automatic Control Processes | 4,4,4 |
| ASE 462 Hydraulics | 3 |
| ASE 464,465 Fluid Control Systems | 4,4 |
| ASE 467 Engineering Acoustics | 3 |
| ASE 487 Advanced Strength of Materials | 3 |
| ASE 489 Transportation Systems: Planning and Design | 3 |

Total credits required = 199
TABLE II
PORTLAND STATE UNIVERSITY
DEPARTMENT OF ENGINEERING AND APPLIED SCIENCE

PROPOSED MECHANICAL ENGINEERING OPTION - SCHEDULE

<table>
<thead>
<tr>
<th>Fr.</th>
<th>So.</th>
<th>Jr.</th>
<th>Sr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL</td>
<td>WINTER</td>
<td>SPRING</td>
<td>FALL</td>
</tr>
<tr>
<td>MTH 201</td>
<td>MTH 202</td>
<td>MTH 203</td>
<td>MTH 204</td>
</tr>
<tr>
<td>PHYSICS</td>
<td>PH 208</td>
<td>PH 209</td>
<td>PHYSICS</td>
</tr>
<tr>
<td>CH 201</td>
<td>CH 202</td>
<td>CH 203</td>
<td>CH 204</td>
</tr>
</tbody>
</table>

| ENGRT. GRAPHICS | ASE 115 |
| ENGRT. CONCEPTS & PROBLEMS | ASE 111 |
| ENGRT. CONCEPTS & PROBLEMS | ASE 112 |
| ASE 211 | ASE 212 | ASE 213 |
| MFG. PROC | ASE 241 |
| ENGRT. THERMODYNAMICS | ASE 321 |
| ENGRT. THERMODYNAMICS | ASE 322 |
| ENGRT. THERMODYNAMICS | ASE 323 |
| HEAT TRANSFER | ASE 491 |
| D-C CIRCUITS | ASE 401 |
| A-C CIRCUITS | ASE 402 |
| ENERGY CONV. | ASE 403 |
| ASE 354 | ASE 355 | ASE 356 |
| ASE 405 |
| ASE 406 |
| ASE 407 |
| ASE 408 |
| ASE 409 |
| ASE 410 |
| ASE 411 |
| ASE 412 |
| ASE 413 |
| ASE 414 |
| ASE 415 |
| ASE 416 |
| ASE 417 |
| ASE 418 |
| ASE 419 |
| ASE 420 |
| ASE 421 |
| ASE 422 |
| ASE 423 |
| ASE 424 |
| ASE 425 |
| ASE 426 |
| ASE 427 |
| ASE 428 |
| ASE 429 |
| ASE 430 |
| ASE 431 |

<table>
<thead>
<tr>
<th>OUTSIDE SCIENCE</th>
<th>PE</th>
<th>PE</th>
<th>PE</th>
<th>PE</th>
<th>PE</th>
<th>ME</th>
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<tbody>
<tr>
<td>WR 121</td>
<td>WR 122</td>
<td>WR 123</td>
<td>WR 124</td>
<td>WR 125</td>
<td>WR 126</td>
<td></td>
</tr>
<tr>
<td>AL/SS</td>
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<tr>
<td>WR 127</td>
<td>WR 128</td>
<td>WR 129</td>
<td>WR 130</td>
<td>WR 131</td>
<td>WR 132</td>
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<tr>
<td>AL/SS</td>
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<tr>
<td>WR 133</td>
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<td>WR 135</td>
<td>WR 136</td>
<td>WR 137</td>
<td>WR 138</td>
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</tr>
<tr>
<td>AL/SS</td>
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<td>AL/SS</td>
<td>AL/SS</td>
<td>AL/SS</td>
<td></td>
</tr>
</tbody>
</table>

| ENGRT. ECON. | EC 320 |
| ENGRT. DESIGN | AL/SS |
| ENGRT. MEAS. & INST. | AL/SS |

Credits/term: 15

Explanation

18 16 16 18 17 16 16 15

Total credits = 199
6. Admission Requirements

a. Please list any requirements for admission to the program that are in addition to the institution.
   None.

b. Will any enrollment limitation be imposed? Please indicate the limitation and rationale therefor. How will those to be enrolled be selected if there are enrollment limitations?
   None proposed at this time.

7. Relationship of Proposed Program to Future Plans

a. Is the proposed program the first of several curricular steps the institution has in mind in reaching a long-term goal in this or a related field?
   The institutional long term goal is to establish basic engineering disciplines. The proposed program is directed towards completion of this curricular step.

b. If so, what are the next steps to be, if the State Board of Higher Education approves the program presently being proposed?
   Not applicable.

8. Accreditation of the Program

a. Is there an accrediting agency or professional society which has established standards in the area in which the proposed program lies? (Please give name.)
   Yes. Engineers' Council for Professional Development (ECPD). (Mentioned in 3b above.)

b. If so, does the proposed program meet the accreditation standards? If it does not, in what particulars does it appear to be deficient? What steps would be required to qualify the program for accreditation?
   The published criteria by ECPD for program accreditation address the following five aspects:

   (i) Program suitability
   (ii) Faculty quality
   (iii) Student quality
   (iv) Administration of the Engineering Division of the University
   (v) The Institution - facilities, including laboratories, libraries and computer facilities

   Of these, the first four are common to all engineering programs at Portland State. In addition, it is only specific laboratory facilities for mechanical engineering which differentiate the proposed program from other engineering programs at Portland State. ECPD granted accreditation to the Structural Engineering Option in 1975.
With departmental resources, the Portland Advisory Committee on Engineering Education (PACEE) support and other outside resources, it is anticipated that in the category of laboratory equipment, the proposed program will achieve only the minimum requirement for initial accreditation inspection in October 1978.

c. If the proposed program is a graduate program in which the institution offers an undergraduate program, is the undergraduate program fully accredited? If not, what would be required to qualify it for accreditation? What steps are being taken to achieve accreditation?
Not applicable.

9. Evidence of Need

a. What evidence does the institution have of need for the program? Please be explicit.

(i) The Applied Science Option - Mechanical Engineering emphasis currently offered already enrolls about one-third of all engineering majors at Portland State.
(ii) At the present time, these students wishing to obtain employment in Mechanical Engineering must elect this Applied Science Option.
(iii) Many job opportunities in the field of Mechanical Engineering specify a Mechanical Engineering degree (or option) as entry level requirement, thus causing our current program offering to be an ineligible qualification for them.
(iv) Requests and inquiries for PSU to offer evening programs in Mechanical Engineering are substantial, mostly coming from the Portland metropolitan area.
(v) At the national level, demand for Mechanical Engineers exceeds supply (1). This situation is duplicated at both the regional and local levels (see enclosed letter from Portland Advisory Committee on Engineering Education (PACEE)).

10. Student Interest

a. What is the estimated enrollment and the estimated number of graduates of the proposed program in the next five years?

Current enrollment in Applied Science Option - Mechanical Engineering Emphasis:

- Seniors: 43
- Juniors: 54
- Sophomores: 65
- Freshmen: 87
- Total: 249

(1) U. S. Department of Labor - Employment and Training Administration
"Occupations in Demand at Job Service Offices"
Estimated enrollment and number of graduates of the proposed program in the next five years:

<table>
<thead>
<tr>
<th>Academic Years</th>
<th>Estimated Enrollment</th>
<th>Estimated Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978-79</td>
<td>200</td>
<td>38*</td>
</tr>
<tr>
<td>1978-80</td>
<td>240</td>
<td>45*</td>
</tr>
<tr>
<td>1980-81</td>
<td>300</td>
<td>60*</td>
</tr>
<tr>
<td>1981-82</td>
<td>400</td>
<td>82</td>
</tr>
<tr>
<td>1982-83</td>
<td>500</td>
<td>94</td>
</tr>
</tbody>
</table>

*Student attrition assumed to be partially compensated for by transfer from community college at end of freshman and at end of sophomore years. Estimated graduates thus reflects numbers currently enrolled in lower division.

b. If the proposed program is an expansion of an existing one, give the enrollment in the existing program over the past five years.

<table>
<thead>
<tr>
<th>Total Enrollment in Applied Science Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973-74</td>
</tr>
<tr>
<td>1974-75</td>
</tr>
<tr>
<td>1975-76</td>
</tr>
<tr>
<td>1976-77</td>
</tr>
<tr>
<td>1977-78</td>
</tr>
</tbody>
</table>

c. Is the proposed program intended primarily to provide another program option to students who are already being attracted to the institution, or is it anticipated that the proposed program will draw its clientele primarily from students who would not otherwise come to the institution were the proposed program not available there?

The proposed program is intended primarily to provide an improved program option to students who are already attracted to the institution.

Nevertheless, in view of the projected demand for Mechanical Engineering graduates in the Portland metropolitan area, it is anticipated that the proposed program will serve to maintain and possibly accelerate the current growth rate, attracting students who would not otherwise come to the institution.

11. Manpower Needs

a. Identify statewide and institutional service area manpower needs the proposed program would assist in filling.

(i) The supply of engineering graduates from Oregon's Institutions of Higher Education is lagging behind the national average by about 23%. Oregon produces 142.3 engineering graduates per million population (2). Nationally it is 184.8 engineering graduates per million population.

(ii) In Oregon, the fraction of graduates receiving engineering degrees is 3.9% (2).

(iii) In the national situation, the fraction of total number of job offers made to engineering majors is 52.6% (3).

(iv) These data are further substantiated as applicable to the Portland metropolitan area by the business and industry advisors in the Portland Advisory Committee on Engineering Education (PACEE).

b. What evidence is there that there exists a regional or national need for additional qualified persons such as the proposed program would turn out?

(i) During 1977, the average monthly Job Bank openings available in Mechanical Engineering were 3800 (1). This is categorized by the U.S. Department of Labor as an Occupational Group with gains in Job Bank openings well above the national average.

(ii) The U.S. Department of Labor - Bureau of Labor Statistics estimates that the annual average of job openings for mechanical engineers to 1985 will be 8900 per year (4). Most recent available data indicates a short fall of 1670 graduates or 18% for 1975-76 year (5).

(iii) National need is evidenced by the data reported by the College Placement Council (August 1977) which shows that job offers made to graduates of engineering programs account for more than 50% of all job offers made, and that engineering offers alone rose by 53% in 1976-77 over the previous reporting year.

12. Special Interest and Other Needs

a. Are there any other compelling reasons for offering the program?

No.

b. Identify any special interest in the program on the part of local or state groups (e.g., business, industry, agriculture, professional groups).

The Portland Advisory Committee on Engineering Education (PACEE) comprised of over fifty business, industry, government, and educational institutions, has been a prime supporter of the transition from the Mechanical Engineering emphasis within Applied Science to a Mechanical Engineering option. They have set substantial goals for support in this matter in terms of financial assistance for laboratory equipment (see letter attached). Specifically, the PACCEE goal for funds for laboratory equipment for mechanical engineering at PSU is $60,000.

c. Have any special provisions been made for making the complete program available for part-time or evening students?

Yes. It is the ongoing policy within the Department of Engineering and Applied Science to make all programs available for part-time or evening students. The proposed program will be offered consistent with this policy.

Duplication of Effort

13. Similar Programs in the State
   
a. List any similar programs in the state.
   
   B.S. Mechanical Engineering - Oregon State University
   B.S. Mechanical Engineering - University of Portland
   
b. If similar programs are offered in other institutions in the state, what purpose will the proposed program serve? Is it intended to supplement, complement, or duplicate any existing programs?
   
   (i) The proposed program is similar only to the extent that all three programs have Mechanical Engineering as the primary area of study. The proposed program is significantly different from the other two existing programs because of its special emphasis on mechanical engineering design.
   
   (ii) Further purposes served by the proposed program
   
   a. Because of the present large number of students electing the Mechanical Engineering emphasis in the Applied Science Option, the need for a mechanical engineering program (such as proposed) in the Portland metropolitan area is amply demonstrated.
   
   b. The proposed program is specifically intended to serve those placebound students in the Portland metropolitan area who require that education which will enable them to practice professionially in Mechanical Engineering.
   
   (iii) The proposed program is not intended to supplement, complement, or duplicate any existing programs.
   
   c. Resources of other institutions are not required for the proposed program.

Resources

14. Faculty
   
a. List present faculty who would be involved in offering the proposed program, with pertinent information concerning their special qualifications for service in this area.
   
   The faculty listed below are all full-time members of the Department of Engineering and Applied Science, PSU.

Mechanical Engineering Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrence Willis, P.E., Assoc. Prof (1977)</td>
<td>Head of Applied Science Section</td>
</tr>
<tr>
<td></td>
<td>Mechanical Engineering Design, Lubrication</td>
</tr>
<tr>
<td>Ph.D., U. of Nottingham</td>
<td></td>
</tr>
<tr>
<td>Ph.D., Virginia Poly. Inst.</td>
<td></td>
</tr>
<tr>
<td>M.S., Oregon State University</td>
<td></td>
</tr>
</tbody>
</table>

*Registered Professional Engineer
Nan-Teh Hsu, Professor (1958)  
Ph.D., Cal. Inst. of Tech.  
Engineering Thermodynamics,  
Heat Transfer, Engineering Materials

Frank P. Terraglio, Professor (1966)  
Ph.D., Rutgers U.  
Air Pollution Control and Design, Environmental Engineering, Engineering Mechanics

Fred M. Young, P.E., Professor (1974)  
Ph.D., Southern Methodist University  
Head of Department of Engineering and Applied Science  
Thermodynamics, Heat Transfer, Fluid Mechanics, Thermal Systems Design

George A. Tsongas, P.E., Assoc. Prof. (1971)  
Ph.D., Stanford  
Energy Engineering, Solar Energy, Laser Methods

David A. Jannsen, Asst. Prof. (1950)  
Engineering Graphics, Manufacturing Processes

Herman J. Migliore, P.E., Asst. Prof. (1977)  
D. Eng., U. of Detroit  
Mechanical Engineering Design, Computer Aided Design, Stress Analysis

Other Support Faculty (Engineering) - Full-Time Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hacik Erzurumlu, Ph.D., P.E.</td>
<td>Civil-Structural Engineering</td>
</tr>
<tr>
<td>Robert E. Miller, Ph.D., P.E.</td>
<td>Civil-Structural Engineering</td>
</tr>
<tr>
<td>Wendelin H. Mueller, Ph.D., P.E.</td>
<td>Civil-Structural Engineering</td>
</tr>
<tr>
<td>Franz N. Rad, Ph.D., P.E.</td>
<td>Civil-Structural Engineering</td>
</tr>
<tr>
<td>Kendall B. Wood, M.F., P.E.</td>
<td>Civil-Structural Engineering</td>
</tr>
<tr>
<td>Paul E. Gray, Ph.D.</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Stephen W. Flax, Ph.D.</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Vijay K. Garg, Ph.D.</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Ralph D. Greiling, M.Ed., P.E.</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Donald Kellas, B.S., P.E.</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Jack C. Riley, E.E., P.E.</td>
<td>Electrical Engineering</td>
</tr>
</tbody>
</table>

In addition to the above listed full-time faculty members, special section faculty will be utilized where appropriate, essentially being drawn from engineering specialists in professional practice in the Portland metropolitan area.

b. Estimate the number, rank, and background of new faculty members who would need to be added to initiate the proposed program; who would be required in each of the first four years of the proposed program's operation. What kind of commitment does the institution make to meeting these needs? What kind of priority does the institution give this program in staff assignment?

Requirements for the proposed program do not exceed those of the ongoing Mechanical Engineering emphasis within the Applied Science option. Consequently, no additional faculty members would be required to initiate
the proposed program.

c. Estimate the number and type of support staff needed in each of the first four years of the program.

Requirements for the proposed program do not exceed those of the existing Mechanical Engineering emphasis within the Applied Science Option. Consequently, no additional support staff are needed to specifically maintain the proposed program within the first four years.

15. Library

a. Describe what steps have been taken to assess the adequacy of the library for supporting the proposed program.


b. Describe in objective terms the adequacy of the collection re. the proposed program.

The standard monographic guide to undergraduate collections is Books for College Libraries. The library owns 56% of the suggested holdings in mechanical engineering, including engineering mathematics and applied mechanics.

In terms of reference works the mechanical engineering collection is 53-55% complete. However, many of the sources lacking are obviously too sophisticated for an undergraduate program (e.g., Referentivnyi Zhurnal. Tekhnologiya Mashinostroyeniya). In addition to the general engineering reference sources (i.e., Applied Science and Technology Index, British Technology Index, Engineering Index) the library owns more specialized sources (e.g., Applied Mechanics Reviews, ASTM Standards, etc.). Other expensive reference tools (e.g., ASME Boiler and Pressure Vessel Code) are readily available at other local libraries.

Serial holdings are about 56% complete when measured against a comprehensive serials collection for mechanical engineering. However, most of the major journals, particularly those of engineering societies are in the collection (e.g., ASME Transactions, series A-J). For the most part those journals lacking are in foreign languages or in the fields of lubrication, automotive and railway engineering.

Finally, it should be noted that the library is a federal government depository library. As such we receive publications of the U.S. Bureau of Standards, etc. Portland State is also a depository for many NASA, EPA and ERDA technical reports.
c. How much, if any, support is required to get the material needed to achieve adequacy?

The current average cost for engineering monographs purchased by Portland State is ca. $21. At this rate ca. $200 is necessary to bring the collection into line with the recommendations of Books for College Libraries. It is also recommended that $155 be reserved for a few new journal subscriptions (e.g., Journal of Mechanical Engineering Science, Experimental Mechanics, Design Engineering, etc.). An additional $500 for reference materials and monographs to upgrade the collection is desirable.

d. How is it planned to acquire the needed support?

Built into the budget model by which the library allocates its monographic resources is a factor for enrollment increase. Because of the current and projected disproportionate growth in engineering enrollment the engineering department's share of the total book budget will increase.

This past year the bulk of the engineering-book budget has been used to strengthen the electrical/electronics collection. It may be appropriate in the next fiscal year to divert more of the engineering-book budget to the undergraduate mechanical engineering collection.

16. Facilities and Equipment

a. What special facilities in terms of buildings, laboratories, equipment are necessary to the offerings of a quality program in the field and at the level of the proposed program?

Teaching laboratories and associated equipment, most of which are already in hand, are an integral part of each of the major course areas of Mechanical Engineering.

Structures/Materials
Fluid Mechanics
Materials Processing/Manufacturing Processes
Mechanical Engineering Design
Engineering Drawing
Environmental
Laser Technology
Vibrations and Acoustics
Heat Transfer/Thermodynamics
Design Projects

In addition to the above listed laboratories, a Digital Computer Facility is also an essential element which is currently available.

b. What of these facilities does the institution presently have on hand?

<table>
<thead>
<tr>
<th>Teaching Laboratories</th>
<th>Floor Space (ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Structures/Materials</td>
<td>3400</td>
</tr>
<tr>
<td>*Fluid Mechanics/Hydraulics</td>
<td>1100</td>
</tr>
<tr>
<td>**Materials Processing/Manufacturing Processes</td>
<td>1100</td>
</tr>
</tbody>
</table>

*Serve both Civil-Structural Engineering and Mechanical Engineering
**Also serves as a machine shop, enabling the construction of laboratory equipment and student projects for all students.
A Harris 200 digital computer, capable of both batch and time-sharing service has been purchased by the University, and is now operational. Over fourteen computer terminals are available in Science Buildings I and II, providing convenient student access to the computer.

In terms of equipment required for the above listed laboratories, the Portland Advisory Committee on Engineering Education (PACEE) has initiated a program to raise funds to provide basic equipment requirements for Mechanical Engineering. The goal set is $60,000 (see attached letter). This funding will be used in establishing laboratory equipment for teaching purposes in each of several areas, viz:

- Vibration/Acoustics
- Heat Transfer/Thermodynamics
- Materials Processing
- Design Laboratory

The remaining laboratories listed in 16 a currently have equipment sufficient to support the Mechanical Engineering emphasis in the Applied Science Option.

c. What facilities beyond those now on hand would be required in support of the program?

Additional equipment for the following four laboratory areas:

- Vibration/Acoustics
- Heat Transfer/Thermodynamics
- Materials Processing
- Design Laboratory

d. How does the institution propose these additional facilities and equipment shall be provided?

(i) Outside funding by PACEE $60,000 - see 16 b above.
(ii) $10,000 from the ongoing equipment budget has been allocated to help establish minimum laboratory equipment for program accreditation for the Applied Science Option - Mechanical Engineering emphasis.
(iii) Continued development under the ongoing equipment budget allocations due to the Department.
(iv) Funding is being and will continue to be sought through Federal Government educational equipment grants, etc. Such additional funding will serve to accelerate the program of laboratory development in Mechanical Engineering at PSU.
SUMMARY OF ESTIMATED ADDITIONAL COSTS FOR PROPOSED PROGRAM

Portland State University  Department of Engineering and Applied Science
Program B.S. Degree in Mechanical Engineering as Option in Engineering and Applied Science
Effective Date Immediately

1. Personnel
   a. Faculty
   b. Graduate Assistants
   c. Support Personnel
   d. Fellowships & Scholarships
      TOTAL
      Percentage of Total
      from State Funds

2. Other Resources
   a. Library
   b. Supplies & Services *
   c. Movable Equipment
      TOTAL
      Percentage of Total
      from State Funds

3. Physical Facilities
   Construction of New Space or Major Renovation
   Percentage of Cost
   from State Funds
   GRAND TOTAL
   Percentage of Total
   from State Funds

4. Sources of Funds
   a. State Funds - Going level Budget
   b. State Funds - Special Appropriations
   c. Federal Funds
   d. Other Grants
   e. Fees, Sales, etc.
   f. Other
      TOTAL

First Year  Second Year  Third Year  Fourth Year

<table>
<thead>
<tr>
<th></th>
<th>Amt.</th>
<th>FTE</th>
<th>Amt.</th>
<th>FTE</th>
<th>Amt.</th>
<th>FTE</th>
<th>Amt.</th>
<th>FTE</th>
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<td><strong>First Year</strong></td>
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<td></td>
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<tr>
<td>Faculty</td>
<td></td>
<td></td>
<td>$S</td>
<td></td>
<td>$S</td>
<td></td>
<td>$S</td>
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<tr>
<td>Graduate Assistants</td>
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<td></td>
<td>$S</td>
<td></td>
<td>$S</td>
<td></td>
<td>$S</td>
<td></td>
</tr>
<tr>
<td>Support Personnel</td>
<td></td>
<td></td>
<td>$S</td>
<td></td>
<td>$S</td>
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<td>$S</td>
<td></td>
</tr>
<tr>
<td>Fellowships &amp; Scholarships</td>
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<tr>
<td><strong>TOTAL</strong></td>
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<td>$855</td>
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<td>$855</td>
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<td>$855</td>
</tr>
<tr>
<td><strong>Percentage of Total</strong></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Funding Program by PACEE now under way - anticipated to obtain minimum required for program accreditation. See response to 12.b.

16. SEQUENCE OF ACTION:

Approved by Library  Daniel M. Newbery  Date 3/1/78
Approved by Dept. Curriculum Committee  Date 3/1/78
Approved by Dept. Head  David M. Young  Date 3/1/78
Approved by College Curriculum Committee  Date 3/1/78
Approved by College Dean  B.C. Berndtson  Date 3/1/78
As you know, the Portland Advisory Committee on Engineering Education, in representing the engineering educational needs of the majority of the major Portland businesses and industries, has supported the development of engineering at Portland State University. In the past three years PACEE has formed sub-committees on Civil-Structural, Electrical-Electronic, and Mechanical Engineering. These sub-committees, in consultation with the faculty and administration of the College of Science and the Department of Engineering and Applied Science, were responsible for PACEE's adoption of the following objectives:

(1) Development of a high-quality engineering program at Portland State University - a program which should ultimately lead to an accreditation of all the aforementioned (Civil-Structural, Electrical-Electronic, and Mechanical Engineering) disciplines, would be of recognizable benefit to the citizens of the State of Oregon and provide a necessary resource for the orderly expansion of local industry and government.

(2) This same program would be of benefit to a significant number of potential engineering students in the area who might otherwise be denied access to engineering undergraduate degrees.

(3) A program, based upon these objectives, must result in a coordinated effort among all disciplines and necessarily involve a phased plan of development which recognize resource limitations through proper assignment of priorities.

(4) The program must consider and recognize that contemporary engineering education consists of three principal parts; basic science, liberal studies and engineering studies with the understanding that engineering education should prepare a student to function effectively as a practicing engineer by preparing students to deal with the design process in itself.

(5) To recognize the commonality of our own program objectives and basic accreditation policies advanced by ECPD.
(6) Students be given more and better advice on the specific characteristics of major industries and that PACEE provide the interface for communicating these needs by mechanisms such as promoting co-op education programs, visitations and summer employment.

In pursuing these objectives, PACEE has focused its efforts this year on a goal of assisting the development of mechanical engineering laboratories by providing $60,000. The program proposals for options in civil and mechanical engineering are an integral part of the plan for achieving these objectives and are therefore enthusiastically supported by PACEE.

Sincerely,

D. R. Miller,
Chairman, PACEE

c: Dr. Karl Dittmer, PSU
   Dr. Fred Young, PSU
   Mr. Dale Walhood
PORTLAND STATE UNIVERSITY
PROPOSAL FOR CHANGE IN EXISTING PROGRAM

Submitted by: Theater Arts Department

We request the following changes in the Undergraduate Program Requirements for Major.

Existing Program:

Requirements for Major:

In addition to meeting the general University degree requirements, the major in theater arts will meet the following special requirements:

TA 141, 142, 143 Fundamentals of Acting Techniques 9
TA 211, 212, 213 Fundamentals of Technical Theater 9
TA 252 Makeup 1
TA 364 Directing 3
TA 365 Intermediate Directing 3
TA 411 Scene Design or
   TA 407 Background to Scene Design 3

Twelve credits selected from the following courses: 12

TA 374, 375, 376 Modern Theater
TA 471, 472 Theater History
TA 381, 382 American Theater and Drama
TA 464, 465, 466 Development of Dramatic Art

Six credits of TA 353 Workshop Theater II with a maximum of three credits in any one of the following subfields. Workshop credits in excess of this maximum may be used to satisfy elective and general requirements.

(1) acting-directing
(2) technical theater
(3) theater management-public relations

Six elective credits selected from the theater arts curriculum 6

Total 52

Proposed Program:

Requirements for Major:

In addition to meeting the general University degree requirements, the major in theater arts will meet the following special requirements:

TA 141, 142, 143 Fundamentals of Acting Techniques 9
TA 211, 212, 213 Fundamentals of Technical Theater 9
TA 252 Makeup 1
TA 321 Fundamental Stage Costuming 3
TA 364 Directing 3
TA 411 Scene Design or
   TA 311 Background to Scene Design 3
TA 455 Directing II 3
Proposed Program (cont.)

Twelve credits selected from the following courses:

TA 381, 382 American Theater and Drama
TA 461, 462, 463 Modern Theater
TA 464, 465, 466 Development of Dramatic Art
TA 471, 472, 473 Theater History

Six credits from TA 353 Workshop Theater II Acting-Directing,
TA 354 Workshop Theater II Technical Theater, TA 355 Workshop
Theater II Management and Public Relations, with a maximum
of three credits in any one. Workshop credits in excess of
this maximum may be used to satisfy elective and general
requirements

Six elective credits from the theater arts curriculum

Rationale

To include fundamental knowledge of the art of stage costume as a prerequisite
for a degree representing basic knowledge of all arts of theater; to align
course numberings with currently proposed listings.

Request prepared by Jack Featheringill

Approved by Department Chairman

Approved by T.A. Curriculum Committee

Approved by College Curriculum Committee

Approved by College Dean
The Department of Biology requests that the following changes be made in the undergraduate program.

**Existing Catalog statement in full:** (This statement will appear in the 1978-79 Bulletin and was approved last year by the committee)

B.A., B.S.
Secondary Education Program

M.A., M.S.
M.A.T., M.S.T.
Ph.D.—participating department in environmental science doctoral program

**UNDERGRADUATE PROGRAMS**

The biology program is designed to give students preprofessional training in medical technology, nursing, agriculture, forestry and other applied fields; and to provide the necessary background for advanced study leading to graduate degrees in the more specialized fields of the biological sciences.

A student planning to enter medicine, dentistry, or other professional fields should consult the catalog of the professional school to which the student intends to apply following preprofessional work in biology and other sciences at Portland State.

Biology is also a teaching major in the program of secondary education.

The Oregon State System of Higher Education maintains an interinstituational Institute of Marine Biology near Coos Bay on the Oregon coast during the summer months. In addition, a consortium of state and private schools of higher education runs summer programs at the Malheur Field Station north of Burns in the desert and arid mountain areas of south central Oregon and in the Malheur Wildlife Refuge. Biology majors are encouraged to spend at least one summer at these institutions, or at some comparable field laboratory, during the break between their sophomore and junior or senior years.

**REQUIREMENTS FOR MAJOR**

The biology major is required to take a minimum of 45 credits in the field in addition to certain prescribed course sequences in mathematics, chemistry and physics.

In addition to meeting the general university requirements the major in biology must meet the following departmental requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 101, 102, 103</td>
<td>General Biology</td>
<td>9</td>
</tr>
<tr>
<td>Bi 335</td>
<td>Principles of Physiology or Ch 330 Introductory Biochemistry</td>
<td>4-5</td>
</tr>
<tr>
<td>Bi 422</td>
<td>Introduction to Genetics</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Biology electives (upper division)</td>
<td>28-29</td>
</tr>
</tbody>
</table>

Total in biology (minimum) 45
College mathematics to include one of the following:
• MTH 206 Finite Mathematical Structures
• or MTH 201 Integral Calculus
• or MTH 365 Statistical Methods

Ch 204, 205, 206, 207 General Chemistry or equivalent ........................................ 15
Ph 201, 202, 203, General Physics and
Ph 208, 209, 210 Physics Laboratory ................................................................. 15
Not less than 8 credits in organic chemistry ....................................................... 8

Program total .................................................. 95

The department will not accept courses taken under the Pass/No Pass option, with the
exception of BI 401, 405, 407, 505 which are offered only on a Pass/No Pass basis.

Of the 45 credits required in Biology, at least 36 credits must be in courses other
than Research, Reading, and Conference and Seminar. The remaining 9 credits may include
no more than a total of 8 credits in Research and Reading and Conference. An under-
graduate student will be admitted to a 500-numbered course in Biology only with the
express written consent of the instructor of that course.

SECONDARY EDUCATION PROGRAM

Advisors: Richard Forbes, Robert Tinnin.

Students may qualify to teach biology in the secondary schools by completing the
education requirements on page XX and by completing one of the options listed below:

Biology Majors

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 101, 102, 103 General Biology</td>
<td>9</td>
</tr>
<tr>
<td>BI 321 Introduction to Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BI 355 Principles of Physiology</td>
<td>4</td>
</tr>
<tr>
<td>BI 357 General Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BI 422 Introduction to Genetics</td>
<td>4</td>
</tr>
<tr>
<td>BI 426 Evolution</td>
<td>3</td>
</tr>
<tr>
<td>Biology Electives</td>
<td>17</td>
</tr>
</tbody>
</table>

Nonbiology Majors

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 101, 102, 103 General Biology</td>
<td>9</td>
</tr>
<tr>
<td>BI 201, 202, 203, Human Biology</td>
<td>12</td>
</tr>
<tr>
<td>BI 321 Introductory Microbiology</td>
<td>5</td>
</tr>
<tr>
<td>BI 334 Systematic Botany</td>
<td>4</td>
</tr>
<tr>
<td>BI 357 General Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BI 422 Introduction to Genetics</td>
<td>4</td>
</tr>
<tr>
<td>BI 426 Evolution</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, students must have 18 credits in physical sciences and earth sciences, as
approved by advisor.

GRADUATE PROGRAMS

The Department of Biology offers graduate study leading to the Master of Arts or Master
of Science, the Master of Arts in Teaching or Master of Science in Teaching degrees. The
department also participates in the Environmental Science and Resources doctoral program.
Specialization studies in the basic principles and techniques of the discipline that combine with interdisciplinary environmental sciences courses offered and exam will partially fulfill the requirement for the Ph.D. in Environmental Sciences and Resources. For information relative to the Ph.D. program in Environmental Sciences and Resources, see page xx.

In addition to the instructions for admission to the graduate program as they appear on page xx, we require the following information from each applicant to the MS/MA program in Biology and to the Ph.D. program in Environmental Sciences/Biology:

1. Scores on the Graduate Record Examination (GRE), to include the advanced biology exam.
2. Two letters of evaluation from persons qualified to assess your promise as a graduate student.

The student should contact the department for a statement of current admission policy.

The prospective graduate student should realize that a high GPA and acceptable GRE scores do not guarantee admission to the graduate programs in biology. This is because of the many departmental factors which must be taken into consideration during the admission process, such as availability of appropriate advisors and research space.

DEGREE REQUIREMENTS

University master's degree requirements are listed on page xx. Specific departmental requirements are listed below.

Master of Arts or Master of Science

The student must complete at least 30 credits in the field of biology, of which at least 22 credits must be in 500-level courses. No more than six credits may be in Bf 503 Thesis. No more than a total of 15 credits may be in seminar, reading and conference, research and thesis. A maximum of 15 credits may be programmed as electives in fields related to biology in consultation with the degree advisor. Successful completion of a final oral examination and a thesis is required.

Master of Arts in Teaching or Master of Science in Teaching

The student should, in consultation with the departmental advisor, establish his degree program before the completion of 15 credits of course work. The program must include no less than nine credits nor more than 15 credits in education courses: a minimum of 24 credits in the field of biology and at least 12 credits in 500-level courses. In order to fulfill requirements for the degree, the student must complete satisfactorily the degree program and pass both a written and a final oral examination.

In order to meet the standard (five-year) teaching norm in biology, the student must complete 60 credits in science, including 42 credits in biology. Preparation must include work in the area of genetics, evolution, microbiology and ecology.
Proposed catalog statement is full. (These include changing from 45 hours total required for B.S. in Biology to 50 total hours, and some necessary course changes in the Secondary Education Program.) Changes are indicated by italics and underlining.

B.A., B.S.
Secondary Education Program

M.A., M.S.
M.A.T., M.S.T.
Ph.D.-participating department in environmental science doctoral program

UNDERGRADUATE PROGRAMS

The biology program is designed to give students preprofessional training in medical technology, nursing, agriculture, forestry and other applied fields; and to provide the necessary background for advanced study leading to graduate degrees in the more specialized fields of the biological sciences.

A student planning to enter medicine, dentistry, or other professional fields should consult the catalog of the professional school to which the student intends to apply following preprofessional work in biology and other sciences at Portland State.

Biology is also a teaching major in the program of secondary education.

The Oregon State System of Higher Education maintains an interinstitutional Institute of Marine Biology near Coos Bay on the Oregon coast during the summer months. In addition, a consortium of state and private schools of higher education runs summer programs at the Malheur Field Station south of Burns in the desert and arid mountain areas of south central Oregon and in the Malheur Wildlife Refuge. Biology majors are encouraged to spend at least one summer at these institutions, or at some comparable field laboratory, during the break between their sophomore and junior or junior and senior years.

REQUIREMENTS FOR MAJOR

The biology major is required to take a minimum of 50 credits in the field in addition to certain prescribed course sequences in mathematics, chemistry and physics.

In addition to meeting the general university requirements the major in biology must meet the following departmental requirements:

- BI 101, 102, 103 General Biology
- BI 335, Principles of Mycology or Ch 350
  • Introductory Biochemistry
- BI 432 Introduction to Genetics
- Biology electives (upper division)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI 101, 102, 103</td>
<td>9</td>
</tr>
<tr>
<td>BI 335 or Ch 350</td>
<td>4-5</td>
</tr>
<tr>
<td>Introductory Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>BI 432</td>
<td>4</td>
</tr>
<tr>
<td>Biology electives (upper division)</td>
<td>32-36</td>
</tr>
</tbody>
</table>

Total in biology (minimum) 50
College mathematics to be taken from the following:
- Math 103: Mathematical Structures
- Math 201: Integral Calculus
- Math 363: Statistical Methods

Ch 204, 205, 206, General Chemistry or equivalent ............ 15
Ph 201, 202, 203, General Physics and Ph 204, 205, 206
  Physics Laboratory ........................................ 15
Not less than 8 credits in organic chemistry .................... 8

Program total ........................................... 100

The department will not accept courses taken under the Pass/No Pass option, with the exception of Ed 401, 405, 407, 505 which are offered only on a Pass/No Pass basis. Of the 50 credits required in Biology, at least 36 credits must be in courses other than Research, Reading and Conference and Seminar. The remaining 14 credits may include not more than 6 credits in Research and Reading and Conference. An undergraduate student will be admitted to a 500-numbered course in Biology only with the explicit written consent of the instructor of that course.

SECONDARY EDUCATION PROGRAM

Advisors: Richard Forbes, Robert Timlin.

Student may qualify to teach biology in the secondary schools by completing the education requirements on page 79 and by completing one of the options listed below:

<table>
<thead>
<tr>
<th>Biology Majors</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 101, 102, 103 General Biology or equivalent ..........</td>
<td>9-15</td>
</tr>
<tr>
<td>Bi 200, 201 Elementary Microbiology or Bi 255 Laboratory</td>
<td></td>
</tr>
<tr>
<td>Microbiology ............................................</td>
<td>5</td>
</tr>
<tr>
<td>Bi 355 Principles of Physiology or Ch 257 Laboratory Biochemistry</td>
<td>3-4</td>
</tr>
<tr>
<td>Bi 357 General Ecology or equivalent ..................</td>
<td>9</td>
</tr>
<tr>
<td>Bi 422 Introduction to Genetics .......................</td>
<td>4</td>
</tr>
<tr>
<td>Bi 426 Evolution .......................................</td>
<td>3</td>
</tr>
<tr>
<td>Biology Electives (upper division) ......................</td>
<td>13-23</td>
</tr>
<tr>
<td>Biology Program must include at least 20 upper division credits</td>
<td></td>
</tr>
<tr>
<td>Minimum credit Total ....................................</td>
<td>50</td>
</tr>
</tbody>
</table>

Nonbiology Majors:

<table>
<thead>
<tr>
<th>Nonbiology Majors</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 101, 102, 103 General Biology or equivalent ..........</td>
<td>9-15</td>
</tr>
<tr>
<td>Bi 301, 302, 303 Human Biology or courses in Embryology and Anatomy</td>
<td>12</td>
</tr>
<tr>
<td>Bi 250, 251 Elementary Microbiology .....................</td>
<td>5</td>
</tr>
<tr>
<td>Bi 357 General Ecology or equivalent ...................</td>
<td>3</td>
</tr>
<tr>
<td>Bi 422 Introduction to Genetics .......................</td>
<td>4</td>
</tr>
<tr>
<td>Bi 426 Evolution .......................................</td>
<td>3</td>
</tr>
<tr>
<td>Biology Electives in Botany or Field Oriented Courses</td>
<td>3-6</td>
</tr>
<tr>
<td>Biology Electives in Botany or Field Oriented Courses</td>
<td>3-6</td>
</tr>
<tr>
<td>Total in Biology (minimum) ................................</td>
<td>50</td>
</tr>
</tbody>
</table>

In addition, students must have 18 credits in physical sciences and earth sciences, as approved by advisor.
The Department of Biology offers graduate study leading to the Master of Arts or Master of Science, the Master of Arts in Teaching or Master of Science in Teaching degrees. The department also participates in the Environmental Sciences and Resources doctoral program. Specialized studies in the basic principles and techniques of the discipline when combined with interdisciplinary environmental sciences courses and seminars will partially fulfill the requirements for the Ph.D. in Environmental Sciences and Resources. For information relative to the Ph.D. program in Environmental Sciences and Resources, see page XX.

In addition to the instructions for admission to the graduate program as they appear on page XX, we require the following information from each applicant to the M.S./M.A. program in Biology and to the Ph.D. program in Environmental Sciences/Biology:

1. Scores on the Graduate Record Examination (GRE), to include the advanced biology exam.
2. Two letters of evaluation from persons qualified to assess your promise as a graduate student.

The student should contact the department for a statement of current admission policy.

The prospective graduate student should realize that a high GPA and acceptable GRE scores do not guarantee admission to the graduate programs in biology. This is because of the many departmental factors which must be taken into consideration during the admission process, such as availability of appropriate advisors and research space.

DEGREE REQUIREMENTS

University master's degree requirements are listed on page XX. Specific departmental requirements are listed below.

Master of Arts or Master of Science

The student must complete at least 10 credits in the field of biology of which at least 22 credits must be in 500-level courses. No more than six credits may be in BI 503 Theses. No more than a total of 15 credits may be in seminar, reading and conference research and thesis. A maximum of 15 credits may be programmed as electives in fields related to biology in consultation with the degree advisor. Successful completion of a final oral examination and a thesis is required.

Master of Arts in Teaching or Master of Science in Teaching

The student should, in consultation with the departmental advisor, establish his degree program before the completion of 15 credits of course work. The program must include no less than nine credits nor more than 15 credits in education courses; a minimum of 24 credits in the field of biology and at least 12 credits in 500-level courses. In order to fulfill requirements for the degree, the student must complete satisfactorily the degree program and pass both a written and a final oral examination. In order to meet the standard (five-year) teaching earn in biology, the student must complete 60 credits in science, including 42 credits in biology. Preparation must include work in the area of genetics, evolution, microbiology and ecology.
The Department of Biology is currently trying to upgrade its undergraduate program. Each of the suggested changes is in pursuit of this goal.

1. **Change from 45 to 50 credit hours in Departmental courses for the B.S. in Biology.**

   The Department feels the need to broaden the base of biological studies for our majors. Combined with our requirements of 50 credit hours in Math, Chemistry, and Physics it would make the total program 100 credit hours.

2. **Course changes in the Secondary Education Program.**

   a. The course change of Bi 321 Introductory Biology to Bi 420 Introductory Biology makes it necessary to remove this course from the program and replace it with Bi 220, 221 Elementary Microbiology.

   b. The option of Ch 350 Introductory Biochemistry is already available for our majors and should be available for this program also.

   c. Bi 334 Systematic Botany is removed and replaced by a botany-field course option for at least two reasons: Secondary teachers need the background in this area, and Bi 334 Systematic Botany is not taught on a regular basis because the Department lacks a systematic botanist (flowering plant taxonomist).

---

Request prepared by: B. L. Layman Date: 3/4/78

Approved by Department Head: J. R. Taylor Date: 6 Mar 1978

Approved by College Curriculum Committee: Date: 8 Mar 1978

Approved by College Dean: Date: 3/8/78
The Department of Physics proposes several minor changes in its present program. These changes are indicated by italicized type in the proposed catalog statement.

Existing catalog statement:

B.A., B.S.
Secondary Education Program
M.A., M.S.
M.A.T., M.S.T.
Ph.D.—participating department in environmental science doctoral program.

UNDERGRADUATE PROGRAMS

The program in physics provides the fundamental knowledge and understanding basic to all the scientific and engineering fields. It prepares students for advanced study in physics, and in a wide variety of other rapidly expanding fields such as space science, astronomy, meteorology, electronics, and biophysics. It also provides training for the student planning a professional career in the laboratories of industry, government, or the university. The physics major takes 52 upper division credits in physics and science, and is encouraged to participate in undergraduate research.

Requirements for Major

In addition to meeting the general University degree requirements, the major in physics must meet the following departmental requirements:

Minimum program for students not intending to go on to graduate work:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 201, 202, 203 General Physics and PH 204, 205, 206 Physics Laboratory</td>
<td>15</td>
</tr>
<tr>
<td>PH 301 Atomic Physics and Relativity</td>
<td>4</td>
</tr>
<tr>
<td>PH 364 Optics</td>
<td>4</td>
</tr>
<tr>
<td>PH 365 Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>PH 367, 368, 369 Methods of Experimental Physics I</td>
<td>6</td>
</tr>
<tr>
<td>PH 407 Seminar in Current Literature</td>
<td>3</td>
</tr>
<tr>
<td>PH 414, 415, 416 Methods of Experimental Physics II</td>
<td>6</td>
</tr>
<tr>
<td>PH 424, 425 Analytical Mechanics</td>
<td>8</td>
</tr>
<tr>
<td>PH 431, 432 Electricity and Magnetism</td>
<td>6</td>
</tr>
<tr>
<td>400-level physics electives</td>
<td>6</td>
</tr>
</tbody>
</table>

**Total in Physics (Minimum)**

61
Proposal for Change in Existing Program

One year of calculus......................................................... 12-16
One year of general chemistry; CH 204,205,206,207 recommended........ 12-15
One year of biology............................................................. 9-12
MTH 321,322 Differential Equations...................................... 6

Students planning to attend graduate school are strongly advised to elect
PH 411, 412, 413, 426, 433, and MTH 421, 422, 423.

Courses on which a grade of Pass has been received can be used to fulfill the
departmental graduation requirements.

Secondary Education Program

Advisor: Carl G. Bachhuber

Students who wish to teach physics in secondary school must be accepted into
the program in the School of Education and meet requirements in physics and
education.

To meet the basic subject matter norm, students must either complete a major
in physics or complete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 201,202,203 General Physics</td>
<td>12</td>
</tr>
<tr>
<td>PH 204,205,206 Physics Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>PH 311,312,313 Introduction to Modern Physics</td>
<td>9</td>
</tr>
<tr>
<td>PH 369 Methods of Experimental Physics I</td>
<td>2</td>
</tr>
<tr>
<td>Electives in physics (upper division)</td>
<td>9</td>
</tr>
</tbody>
</table>

In addition, the student must have 18 credits distributed in biology, chemistry
and earth sciences.

All students seeking to satisfy the teaching norm must pass a comprehensive
oral examination covering the subject matter included in the norm.

For School of Education requirements, see page 156.

Students should plan their programs with departmental advisors to insure
conformance to University requirements and to state certification requirements
in teacher education.
Proposed catalog statement:

B.A., B.S.
Secondary Education Program
M.A., M.S.
M.A.T., M.S.T.
Ph.D.--participating department in environmental science doctoral program.

UNDERGRADUATE PROGRAMS

The program in physics provides the fundamental knowledge and understanding basic to all the scientific and engineering fields. It prepares students for advanced study in physics, and in a wide variety of other rapidly expanding fields such as space science, astronomy, meteorology, electronics, and biophysics. It also provides training for the student planning a professional career in the laboratories of industry, government, or the university. The physics major takes 52 upper division credits in physics and science, and is encouraged to participate in undergraduate research.

Requirements for Major

In addition to meeting the general University degree requirements, the major in physics must meet the following departmental requirements:

Minimum program for students not intending to go on to graduate work:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 201,202,203</td>
<td>General Physics or PH 207,208,209</td>
<td>12</td>
</tr>
<tr>
<td>PH 204,205,206</td>
<td>Physics Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>PH 301</td>
<td>Atomic Physics and Relativity</td>
<td>4</td>
</tr>
<tr>
<td>PH 312,313</td>
<td>Introduction to Modern Physics or</td>
<td>6</td>
</tr>
<tr>
<td>PH 412,413</td>
<td>Introduction to Quantum Mechanics and either</td>
<td>6</td>
</tr>
<tr>
<td>PH 364</td>
<td>Optics</td>
<td>4</td>
</tr>
<tr>
<td>PH 365</td>
<td>Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>PH 367,368,369</td>
<td>Methods of Experimental Physics I</td>
<td>6</td>
</tr>
<tr>
<td>PH 407</td>
<td>Seminar in Current Literature</td>
<td>3</td>
</tr>
<tr>
<td>PH 414,415,416</td>
<td>Methods of Experimental Physics II</td>
<td>6</td>
</tr>
<tr>
<td>PH 424,425</td>
<td>Analytical Mechanics</td>
<td>8</td>
</tr>
<tr>
<td>PH 431,432</td>
<td>Electricity and Magnetism</td>
<td>6</td>
</tr>
</tbody>
</table>

Total in physics (minimum) 61-58
MTH 204, 205, 206 Calculus .............................................................................. 25
One year of general chemistry; CH 204, 205, 206, 207 recommended. ....... 12-15
One year of biology .................................................................................. 9-12
MTH 321, 322 Differential Equations ....................................................... 6

Students must arrange to see a Physics Department advisor prior to registration as a physics major. This step is essential in order to prepare a coherent program of study, since not all courses are taught every year.

Students planning to attend graduate school are strongly advised to elect PH 411, 412, 413, 426, 433, and MTH 324, 421, 422, 423.

Courses on which a grade of Pass has been received can be used to fulfill the departmental graduation requirements.

Secondary Education Program

Advisor: Carl G. Bachhuber

Students who wish to teach physics in secondary school must be accepted into the program in the School of Education and meet requirements in physics and education.

To meet the basic subject matter norm, students must either complete a major in physics or complete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 201, 202, 203 General Physics</td>
<td>12</td>
</tr>
<tr>
<td>PH 204, 205, 206 Physics Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>PH 311, 312, 313 Introduction to Modern Physics</td>
<td>9</td>
</tr>
<tr>
<td>PH 369 Methods of Experimental Physics I</td>
<td>2</td>
</tr>
<tr>
<td>Electives in physics (upper division)</td>
<td>9</td>
</tr>
</tbody>
</table>

In addition, the student must have 18 credits distributed in biology, chemistry and earth sciences.

All students seeking to satisfy the teaching norm must pass a comprehensive oral examination covering the subject matter included in the norm.

For a standard norm, 15 hours of approved upper division and/or graduate level courses in physics, chemistry, biology and/or earth sciences are required in addition to the requirements for a basic norm.
For School of Education requirements, see page 156.

Students should plan their programs with departmental advisors to insure conformance to University requirements and to state certification requirements in teacher education.

Justification for proposed changes: The proposed changes and the rationale for them are presented in the order of their appearance in the proposed catalog statement.

PH 207,208,209 is added as an option in fulfilling the general physics requirements. This is a new course (receiving approval last year) and is intended for students of engineering and others who meet the higher mathematical prerequisite, calculus, over those of PH 201,202,203. The content of both courses is fundamentally the same. However, in the calculus-based course, the material is treated at a more mathematically sophisticated level.

PH 312,313 Introduction to Modern Physics replaces six hours of physics electives in the minimum program requirements. The rationale for this change is simply that we believe all physics majors need a knowledge of the developments of physics in this area. Heretofore, our stronger students were advised to elect six hours of the sequence PH 411,412,413 while others were advised to elect PH 312,313 to satisfy this need. However, we are no longer able to offer PH 411,412,413 every year and are presently recommending PH 312,313 to all of our majors. The proposed change will merely formalize and make mandatory our present recommendations.

MTH 204,205,206 replaces the former requirements, "one year of calculus." The new requirement, MTH 204,205,206, is a calculus course totaling 15 hours. Formerly students could take either the 12-hour or the 15-hour course. The new requirement represents a modest attempt to offset the general declining trend in the mathematical skills displayed by our present generation of students.

The statement regarding advising contains within it, or rather appended to it, the rationale for its addition. (This statement has already been submitted as a proposed non-substantive change.)

MTH 324 Vector Analysis is appended to the existing list of recommended electives. Its inclusion means simply that we regard vector analysis as a useful tool for advanced work in physics.
The statement which spells out the existing additional course requirements for the standard teaching norm over those for the basic norm has already been submitted as a non-substantive change.

In summary, it is noted that the above changes involve no new courses nor do they increase the minimum number of hours required in the major field.

Request Prepared By

Approved By Department Head

Approved By College Curriculum Committee

Approved By College Dean

RS:si
School of Business Administration

PROPOSED CHANGES IN EXISTING PROGRAM

Change in the core requirement for School of Business Administration majors

Delete the requirement for MGMT 111 (3 credits) and substitute a new MGMT 1XX (1 credit) course. Portions of the existing course material are not appropriate for freshmen. Without more understanding of business, the role, use, and impact of computers on business is difficult for students to understand and appreciate. The replacement course would be a one-hour programmed learning course centering on the facilities at PSU, including terminal operations, canned program availability and operations, PSU library routines, statistical and financial packages, and BASIC programming fundamentals. This course would prepare students for computer uses in other classes.

Add a new, three-hour required course, BUAD 3XX (3 credits) on the computer in business. An advisory committee of Portland business executives has recommended the knowledge of computers they desire in our graduates. These topics, not taught in our existing MGMT 111 (3 credits) course because of a lack of prerequisites on the part of students, would include computerized business applications, management information systems, and systems design and analysis. Other topics currently in MGMT 111, such as computer fundamentals and computers and society, will remain in the course.

Add a new three-hour course, BUAD 3XX (3 credits), on financial analysis for management decision making. The course would be required of all students except accounting majors. This course would develop the student's ability to analyze and integrate financial information from accounting, finance, marketing, production, and elsewhere. Emphasis will be on applications to
reinforce the concepts which the students have studied in all fields of business. This course would be a prerequisite to BUAD 453, Business Policies (3 credits) by providing the financial analytical tools necessary for the policies course.

Change MGMT 362, Fundamentals of Management (3 credits) from an elective to a required course. The vast majority of undergraduate business programs require a fundamentals of management course. Our students are at a disadvantage and their administrative education is incomplete without such a class.

**Specification of departmental and general business options for School of Business majors**

The specification of departmental options is deemed necessary to provide business school graduates with needed specialization for their entry and early progress in their selected careers. Many students are indicating a field specialization upon graduation, yet too many have not completed those courses felt to be essential for such a specialty.

Departmental options would be established for accounting, business education, finance/law, management, and marketing. In addition, to provide for the generalist a general business option is recommended.

Department options would consist of 15 hours beyond the core courses, with 9 of the 15 hours at the 400 level, and 9 of the 15 hours required as specific courses. The general business option would require that the 15 hours beyond the core courses be taken from an approved list of courses in a minimum of three different departments, with 9 of the 15 hours at the 400 level. Because
of state teacher certification requirements, some exceptions would exist for the business education major.

Effect on other departments of the university

Although School of Business majors would be required to take additional courses under this change in existing program, these students would still be required to take a minimum of 104 hours outside the School of Business. This is a slight decrease from the existing requirement of a minimum of 111 hours outside the School of Business.
UNDERGRADUATE PROGRAMS
The undergraduate program in business administration is centered on
the principle that in a free society the business enterprise must be re-
sponsibly as well as efficiently man-
gaged. The degree program, includ-
ing both business and non-business
courses, is designed to provide an
understanding of our society, and an
awareness of the function of the
business enterprise in this society, to
develop basic competence in the
application of sound management
principles and appropriate methods
to the solution of business problems,
and to develop limited professional
skills to assist students in locating
initial employment in industry.

The business administration under-
graduate major will take not less
than 63 nor more than 75 credits in
business subjects. The major portion
of his or her college work will be
elective courses in the academic
colleges, particularly in the social
sciences. The business courses are
designed to give the student the
fundamental knowledge of business
operations and principles of man-
gagement, required for entrance to
executive and administrative posi-
tions in business and government.
Their concern is with decisional
areas of, and research and advisory
services available to, management;
and office services that assist both
management and operating person-
nel to perform their functions more
effectively.

Undergraduate programs with spe-
cial emphasis are available within
the business administration major,
and are designed to prepare students
for positions in accounting, market-
ing, production, personnel, finance,
office administration, real estate,
transportation, advertising, insur-
ance, international business, busi-
ness education, and decision sci-
ence.

The business administration undergraduate
major will take not less than 73 nor more
than 82 credits in business subjects.
Requirements for Major

In addition to meeting the general degree requirements of the University, the major in business administration must meet school requirements as follows:

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mgmt 111 The Computer in Business</td>
<td>3</td>
</tr>
<tr>
<td>Actg 211 Introduction to Financial Data</td>
<td>3</td>
</tr>
<tr>
<td>Actg 212 Introduction to Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Actg 213 Management Accounting Systems</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 214 Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>BuAd 305 Business Environment</td>
<td>3</td>
</tr>
<tr>
<td>Finl 326 Legal Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 329 Production Systems</td>
<td>3</td>
</tr>
<tr>
<td>BuAd 344, 345, 346 Systems and Operations Analysis</td>
<td>9</td>
</tr>
<tr>
<td>Finl 359 Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>Mktg 366 Marketing Concepts</td>
<td>3</td>
</tr>
<tr>
<td>BuAd 453 Business Policies</td>
<td>3</td>
</tr>
<tr>
<td>Approved Business Administration and/or Business education electives</td>
<td>21</td>
</tr>
</tbody>
</table>

Total credits required in business administration or in business administration and business education | 63 |

Mth 114, 164, 165 (Mathematics in Business Application; Elements of Statistical Methods) | 9 |

Ec 201, 202, 203 Principles of Economics | 9 |

Economics, psychology, sociology, or anthropology upper division credits in any combination | 9 |

NOTE: 2.0 GPA required in business administration subjects.

Pass/No Pass credits will be allowed for those Business Administration courses which are offered on an optional, Pass/No Pass basis.

Business education students are not required to take BuAd 305; they are required to take Finl 412; and they may eliminate one of the following three required courses: Mgmt 329, Finl 359, or Mktg 366.

Resident credit for degrees in the School of Business Administration may be earned in the Portland State University program or in Portland State Summer Session.

At least a 2.0 GPA is required in business administration subjects; and at least a 2.5 GPA is required for students selecting the Business Education option to participate in Student Teaching.
Pass/No Pass credits will be allowed for those courses listed above which are offered on an optional Pass/No Pass basis.

Students selecting the Business Education option may substitute FinL 412 for BuAd 305; and they may eliminate one of the following three required courses: Mgmt 329, FinL 359, or Mktg 366.

Resident credit for degrees in the School of Business Administration may be earned in the Portland State University program or in Portland State Summer Session.

DEPARTMENTAL OPTIONS

Each of the departments in the School of Business Administration offers an option for those students seeking a specialization in a subject area. In addition, the school provides for those students desiring a broader approach to the study of business by offering a general business option. Each student must select one of these options. Option requirements are satisfied by taking 15 credits beyond the required business courses. In each option, at least 9 of the 15 credits must be in 400 level courses and 9 of the 15 credits are specified in each option.

The courses specified to satisfy the option requirements, which may be distinct from the 9 credits at the 400 level, are:

<table>
<thead>
<tr>
<th>Credits</th>
<th>Accounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Actg 385 Accounting Theory</td>
</tr>
<tr>
<td>3</td>
<td>Actg 482 Income Tax Laws and Accounting</td>
</tr>
<tr>
<td>3</td>
<td>Actg 492 Auditing Concepts and Practices</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
<th>Business Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>See description of teacher certification and other programs below.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credits</th>
<th>Finance-Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>FinL 336 Principles of Risk and Insurance</td>
</tr>
<tr>
<td>3</td>
<td>FinL 413 Business Law</td>
</tr>
<tr>
<td>3</td>
<td>FinL 436 Real Estate Practices</td>
</tr>
</tbody>
</table>
Management
Mgmt 451 Personnel Management ............ 3
Mgmt 454 Organization Theory ............ 3
Mgmt 495 Managerial Planning ............ 3

Marketing
Mktg 415 Marketing Research: Data Collection ........................................ 3
Mktg 463 Consumer Behavior ............ 3
Any 400 level marketing department course ........................................ 3

General Business
9 credits from courses selected from an approved list of courses from a minimum of three different departments. Copies of the approved list are available in the School of Business Administration office.

TYPICAL FRESHMAN PROGRAM

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actg 211 Introduction to Financial Data</td>
<td>3</td>
</tr>
<tr>
<td>Actg 212 Introduction to Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Actg 213 Management Accounting Systems</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 111 The Computer in Business</td>
<td>3</td>
</tr>
<tr>
<td>Wr 121 English Composition</td>
<td>3</td>
</tr>
<tr>
<td>Social science elective</td>
<td>3</td>
</tr>
<tr>
<td>Business elective</td>
<td>3</td>
</tr>
<tr>
<td>Arts and letters—approved courses in one area</td>
<td>3</td>
</tr>
</tbody>
</table>
| Mth 114, 364, 365 (Mathematics in Business Applications; Elements of Statistical Methods) | 3
| HE 150 Health                              | 1       |
| Physical education                         | 1       |
| **Total**                                  | 16      |
Business Education / 229-3722

The Business Education Department at Portland State University offers a program with unique access to a variety of careers. The major goals of the department are: to prepare students who wish to teach business subjects in secondary schools for basic certification; to provide undergraduate emphasis in office administration and office related skills; and to provide graduate education for secondary and community college teachers.

Students in business education earn a B.A. or B.S. in business administration which qualifies them for a variety of positions in business, industry, and government. Those who use elective credits to satisfy Oregon teacher certification prepare for a variety of teaching opportunities including public and private secondary schools, business colleges, industry and government training programs, and related fields.

Programs and Opportunities

*Business Teacher Education* students must be accepted into the program in the School of Education and take required courses in the School of Business Administration and in the School of Education.

*Office Administration* students must meet the requirements for a degree in the School of Business Administration and select course work in an area of emphasis with a business education adviser.

*Elective Classes* in business teacher education and office administration are available for business and non-business majors. One- and two-year programs can be planned to meet specific needs of non-degree students.

*Women In Business* is a specialized, developing area of concern which the Business Education department is meeting with a variety of courses and programs.

Students who select the business education option earn a B.A. or B.S. in business administration which qualifies them for a variety of positions in business, industry, and government.
TYPICAL FRESHMAN PROGRAM

Typical Freshman Program Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting (Actg 211, 212, 213)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Arts and letters (see non-major degree requirement)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Business Machines (BuEd 217)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer in Business (Mgmt 111)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English Composition (Wr 121)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics (Mth 114, 364, 365)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Physical education and health</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Typewriting (BuEd 123, 124, 125)</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>15 15 16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECONDARY EDUCATION PROGRAM

Advisers: Karel Pollard, Carl Pollock, Leonard Robertson, June Underwood, Alice Yetka

Students who wish to teach business subjects in secondary schools should meet the requirements for a degree in business administration (see page 143), (2) be accepted into the program in the School of Education and meet specific education requirements, and (3) complete 36 credits of business and office courses selected from at least four out of the following areas:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typing (BuEd 123, 124, 125, 373)</td>
<td>12</td>
</tr>
<tr>
<td>Shorthand (BuEd 107, 108, 109, 371)</td>
<td>12</td>
</tr>
<tr>
<td>Bookkeeping (Actg 212, 213, or 219, BuEd 372)</td>
<td>9</td>
</tr>
<tr>
<td>Office Procedures (BuEd 311, 312, 313, 335)</td>
<td>12</td>
</tr>
<tr>
<td>Data Processing (Mgmt 111, BuEd 217, 373)</td>
<td>12</td>
</tr>
<tr>
<td>General Business (FinL 218, BuEd 372)</td>
<td>6</td>
</tr>
<tr>
<td>Business Law (FinL 326, 412, 413)</td>
<td>9</td>
</tr>
</tbody>
</table>

*Placement determined by previous experience.

By following this program, students will qualify for the Bachelor of Science degree in Business Administration and the Oregon Basic Teaching Certificate. For further description of the certificate and education requirements, see pages ___.
DEPARTMENTAL COURSES

Accounting / 229-3713

Actg 199 Special Studies
(credit to be arranged)

Actg 211 Introduction to Financial Data (3)
A study of the nature and role of accounting information in our society. An introduction to the processes of data handling and communication as they relate to accounting systems. An exposure to the accounting information generated by various governmental units, businesses and non-profit-making institutions within our society. Actg 211, 212, and 213 are required of business majors.

Actg 212 Introduction to Financial Accounting (3)
A study of accounting principles and practices applicable to the financial accounting system of profit-making enterprises, with a special emphasis on concepts and the significance of accounting information for stockholders, creditors, and other external users of financial information; processing financial data and preparation of financial statements; and accounting for different forms of business enterprises. Prerequisite: Actg 211.

Actg 213 Management Accounting Systems (3)
A study of accounting principles and practices applicable to the information system used by management of business enterprises, with special emphasis on concepts and the uses of accounting information in management decision models; analysis of data needed for management decisions; determination and-control of costs, and budgets for income and cash flows. Prerequisites: Actg 212 and Mgmt 111.

Actg 219 The Accounting Process (3)
The continued study of the basic processes in the accumulation of accounting data, development of the accounting techniques used in the handling of large amounts of information; special journals and controlling accounts; work-sheets used in facilitating the preparation of account statements at the end of the period. Discussion of the problems encountered in accounting for specific accounts and for different types of business organizations. Prerequisite: Actg 212.

Actg 314 Principles of Cost Accounting (3)
Basic principles of cost measurement and reporting for management planning, policy, and control purposes. Methods of data accumulation and control of materials, labor, and indirect costs; job and process cost systems. Overhead budgeting, departmentalization; fixed and variable cost concepts. Prerequisite: Actg 213.
Approved by College/School Curriculum Committee  ________________ Date 3/31/78

Approved by College/School Dean ___________________________ Date 4/20/78
PORTLAND STATE UNIVERSITY

PROPOSAL FOR CHANGE IN EXISTING PROGRAM
UNDERGRADUATE SOCIAL SERVICE MAJOR

Submitted by: School of Social Work

We request the following change in the Undergraduate Program
Requirements for the Major

Existing Program

Requirements for Major
In addition to meeting the general degree requirements of the University, the person majoring in social service will meet the following School requirements.

**Lower Division**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sp 100 Basic Speech Communication</td>
<td>5</td>
</tr>
</tbody>
</table>

In addition, three social science sequences, totaling 18 credits, are required. This also satisfies general University social science requirements.

**Upper Division**

**Foundation Courses**
The following content areas and credit distributions are required as a minimum. For a list of specific course options consult an undergraduate adviser at the School of Social Work.

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social/Political/Economic Problems and Processes</td>
<td>6</td>
</tr>
<tr>
<td>Psychological Development</td>
<td>6</td>
</tr>
<tr>
<td>Social Organization and Group Relations</td>
<td>6</td>
</tr>
<tr>
<td>Socio/Cultural Systems</td>
<td>6</td>
</tr>
<tr>
<td>Statistics and Research Methods</td>
<td>11-12</td>
</tr>
</tbody>
</table>

**Professional Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*SW 300 Field Observation</td>
<td>3-6</td>
</tr>
<tr>
<td>SW 350 Social Welfare as a Social Institution</td>
<td>3</td>
</tr>
<tr>
<td>SW 351 Social Work Practice I</td>
<td>3</td>
</tr>
<tr>
<td>*SW 400 Field Instruction</td>
<td>9-12</td>
</tr>
<tr>
<td>SW 450 The Social Services: Organization and Administration</td>
<td>3</td>
</tr>
<tr>
<td>SW 451 Social Work Practice II</td>
<td>3</td>
</tr>
<tr>
<td>Social Work Electives</td>
<td>9</td>
</tr>
</tbody>
</table>

total in social work 33-39

\[
\text{total for major } 76-80
\]
PROPOSED PROGRAM

REQUIREMENTS FOR MAJOR

In addition to meeting the general University degree requirements, the Undergraduate Social Service Major must meet the following special requirements:

UPPER DIVISION FOUNDATION COURSES

The following content areas and credit distributions are required as a minimum. For a list of specific course options consult an undergraduate adviser at the School of Social Work.

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social/Political/Economic Problems and Processes</td>
<td>6</td>
</tr>
<tr>
<td>Psychological Development</td>
<td>6</td>
</tr>
<tr>
<td>Social Organization and Group Relations</td>
<td>6</td>
</tr>
<tr>
<td>Socio/Cultural Systems</td>
<td>6</td>
</tr>
<tr>
<td>Statistics and Research Methods</td>
<td>11-12</td>
</tr>
</tbody>
</table>

Total 35-36

PROFESSIONAL COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW 300 Field Instruction</td>
<td>6</td>
</tr>
<tr>
<td>SW 350 Social Welfare as a Social Institution</td>
<td>3</td>
</tr>
<tr>
<td>SW 351, 352 Social Work Practice I</td>
<td>6</td>
</tr>
<tr>
<td>SW 400 Field Instruction</td>
<td>12</td>
</tr>
<tr>
<td>SW 450 The Social Services: Organization and Administration</td>
<td>3</td>
</tr>
<tr>
<td>SW 451, 452 Social Work Practice II</td>
<td>6</td>
</tr>
<tr>
<td>Social Work Electives</td>
<td>9</td>
</tr>
</tbody>
</table>

Total 45

Total for Major 80-81

This major is open to students who have achieved upper-division status with the University. Applications are taken prior to the reaching of upper-division standing. Details about admissions are available at the School of Social Work.
Rationale

To ensure uniformity in field instruction as well as consistency of integration between field instruction and practice courses.

Request prepared by

Signed and dated

Approved by School Curriculum Committee

Signed and dated

Approved by Dean

Signed and dated

Approved by College/School Curriculum Committee

Signed and dated

Approved by College/School Dean

Signed and dated
Request for the following changes to be made:

1. Change major core course requirements by:
   (a) adding AJ 318. Criminal Justice Strategies: Research (3) as a required course;
   (b) adding US 202. The Urban Environment (3) as a required course;
   (c) dropping SOC 370. Sociology of Deviancy (3) as a required course;
   (d) dropping PSY 318. Applied Psychology (3) as a required course.

2. Change corrections option course requirements by:
   (a) dropping AJ 318. Corrections Strategy: Research (3) as a required course; and
   (b) adding AJ 360. Corrections Counseling (3) as a required course.

Existing Catalog Statement

Requirements for major. In addition to meeting the general University degree requirements, students who major in administration of justice must complete the special degree core courses. After achieving upper division status, each degree candidate will be further required to select one of the two sets of special professional course concentrations and complete all requirements as outlined in the law enforcement or corrections option:

### Core Courses

- **AJ 111, 112, 113. Introduction to Administration of Justice** ........................................... 9
- **AJ 334. Prevention and Control of Crime in Urban Areas** ............................................ 3
- **AJ 401. Research: Senior Project** ................................................................. 3
- **AJ 409. Criminal Justice Practicum** ............................................................... 3
- **AJ 444, 445. Criminal Law Process** ............................................................... 6
- **Soc 204, 205. General Sociology** ................................................................. 6
- **Soc 337. Minority Groups** .......................................................................... 3
- **Soc 370. Sociology of Deviancy** ................................................................. 3
- **Soc 416. Juvenile Delinquency** ................................................................. 3
- **Soc 417. Criminology** ............................................................................... 3
- **Psy 204. Psychology as a Social Science** .................................................... 3
- **Psy 318. Applied Psychology** ................................................................. 3
- **Psy 434. Abnormal Psychology** ................................................................. 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJ 111, 112, 113</td>
<td>9</td>
</tr>
<tr>
<td>AJ 334.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 401.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 409.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 444, 445</td>
<td>6</td>
</tr>
<tr>
<td>AJ 451</td>
<td>3</td>
</tr>
<tr>
<td>Soc 204, 205</td>
<td>6</td>
</tr>
<tr>
<td>Soc 337</td>
<td>3</td>
</tr>
<tr>
<td>Soc 370</td>
<td>3</td>
</tr>
<tr>
<td>Soc 416</td>
<td>3</td>
</tr>
<tr>
<td>Soc 417</td>
<td>3</td>
</tr>
<tr>
<td>Psy 204</td>
<td>3</td>
</tr>
<tr>
<td>Psy 318</td>
<td>3</td>
</tr>
<tr>
<td>Psy 434</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>54</strong></td>
</tr>
</tbody>
</table>

### Corrections Option

- **AJ 454. Community Based Treatment of Offenders** ........................................... 3
- **AJ electives** ............................................................... 3
- **Soc 463. Correctional and Therapeutic Communities, and 3 credits of upper division sociology to be taken with consent of adviser** ........................................... 6
- **Psy 350. Counseling** ................................................................. 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJ 317, 318</td>
<td>6</td>
</tr>
<tr>
<td>AJ 454</td>
<td>3</td>
</tr>
<tr>
<td>AJ electives</td>
<td>3</td>
</tr>
<tr>
<td>Soc 463</td>
<td>6</td>
</tr>
<tr>
<td>Psy 350</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>
Proposed Catalog Statement (changes in italics, including proposed changes in numbers and titles of several courses)

Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJ 111, 112, 113.</td>
<td>9</td>
</tr>
<tr>
<td>AJ 334.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 318.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 401.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 409.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 444.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 445.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 446.</td>
<td>3</td>
</tr>
<tr>
<td>Soc 204, 205.</td>
<td>6</td>
</tr>
<tr>
<td>Soc 337.</td>
<td>3</td>
</tr>
<tr>
<td>Soc 416.</td>
<td>3</td>
</tr>
<tr>
<td>Soc 417.</td>
<td>3</td>
</tr>
<tr>
<td>Psy 204.</td>
<td>3</td>
</tr>
<tr>
<td>Psy 434.</td>
<td>3</td>
</tr>
<tr>
<td>US 202.</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: 54 credits

Corrections Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJ 317.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 360.</td>
<td>3</td>
</tr>
<tr>
<td>AJ 454.</td>
<td>3</td>
</tr>
<tr>
<td>Soc 463.</td>
<td>3</td>
</tr>
<tr>
<td>Soc 463.</td>
<td>6</td>
</tr>
<tr>
<td>Psy 350.</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: 21 credits

Justifications For Proposed Changes

The addition of AJ 318-Criminal Justice Strategies: Research (3) to the core requirements will insure that all AJ majors have some general knowledge about research procedures and applications related to criminal justice prior to undertaking their required senior research project.

The decision to remove Soc 370 from the core requirements is based on the belief that AJ majors receive sufficient knowledge about deviant behavior from their combined experiences in SOC 204, 205-General Sociology, Soc 416-Juvenile Delinquency, Soc 417-Criminology, and Psy 434-Abnormal Psychology. This opinion is partially the result of a total evaluation of the program's curriculum, conducted during this academic year with the assistance of the Teaching Research Unit of the OSBHE. This evaluation involved a careful examination of instructional material submitted by teachers of supporting courses, consultation with department chairmen, and an alumni questionnaire. The chairman of the Sociology Department has been made aware of this decision.
The decision to remove PSY 318 from the core requirements is largely the result of a gradual de-emphasis of relevant criminal justice material in the course over the past six years. This situation has been discussed with the chairman of the Psychology Department and he is aware of our decision. AJ students will still be required to complete a minimum of six psychology electives, in addition to PSY 204, in order to meet the prerequisites of PSY 434--a required AJ core course.

AJ 318-Corrections Strategy: Research is being removed from the corrections option because it has been proposed that this course be modified to meet the general needs of students in both the law enforcement option and the corrections option as a required core course.

The new course, AJ 360-Corrections Counseling (3), is being added to the corrections option to fill a need that has been identified through our curriculum review project, as well as to balance the number of credits between the two sets of professional courses.

Request prepared by Charles A. Tracy Date 1-25-78
Approved by Program Curriculum Committee Robert W. Heartwood Date 1-25-78
Approved by Program Director Charles A. Tracy Date 1-26-78
Approved by School Curriculum Committee Daniel Mclure Date 4/6/78
Approved by School Dean Date 4/6/78
MEMORANDUM
October 20, 1978

TO: Faculty Senate
FROM: Graduate Council, James Bentley, Chairman

The Graduate Council offers two program proposals—-from the Department of Earth Sciences and the School of Social Work—with a recommendation for Senate approval.

Both involve minor revisions in requirements; neither makes a substantial program change. Although two new courses are requested in the Social Work proposal, they represent specific definition of course content from a sequence of three courses which are being dropped—more a substitution than an addition. No new courses are requested by Earth Sciences.

Department of Earth Sciences

The Earth Sciences Department seeks to upgrade the MAT/MST Program and make it more parallel with the MA/MS Program. It is proposed:

1. To offer graduate programs leading to the Master of Arts and Master of Science Degree in Geology, and the Master of Arts in Teaching and Master of Science in Teaching degree in Earth Sciences. Reference to program options in classical areas of specialization, and in engineering and environmental geology, as well as in joint fields under other departments has been deleted. The current catalog makes no specification of Geology for the MA/MS degree or of Earth Sciences for the MAT/MST degree.

2. To be admitted to a graduate degree program the student must have a baccalaureate degree in Earth Sciences or its equivalent as determined by the Department Graduate Committee. (Existing: Baccalaureate degree in Geology, or its equivalent as determined by the Department Graduate Committee.)

3. To eliminate recommendation of general Graduate Record Examination before admission to the programs and require completion of the Advanced Graduate Record Examination in Geology taken before the second term of regular admission; scores to be evaluated for deficiencies.

4. To add completion of a field-based project in the MAT/MST Program.

(over)
Proposed catalog statement: (Items underlined with a dashed line have been added to the current statement)

GRADUATE PROGRAMS

The Earth Sciences Department offers graduate programs leading to the Master of Arts or Master of Science degree in Geology, and to the Master of Arts in Teaching or Master of Science in Teaching degree in Earth Sciences.

The M.A./M.S. program is designed to train geology students beyond the baccalaureate degree for professional employment or for advanced graduate work. The M.A.T./M.S.T. program is offered for teachers in secondary schools and community colleges.

To be admitted to a graduate degree program, the student must have a baccalaureate degree in earth sciences, or its equivalent as determined by the departmental graduate committee. It is recommended that the Advanced Graduate Record Examination in Geology be taken before admission.

Degree Requirements

University master's degree requirements are given on page 36. Specific departmental requirements for the M.A./M.S. are:

1. Completion of at least 24 credits in the field of geology of which 18 credits must be in 500-level courses.
   (a) At least 9 of these credits must be in courses numbered G 510 or higher.
   (b) A maximum of 9 credits will be allowed for courses numbered G 501 and G 505.
   (c) Students must complete at least 6 but no more than 9 credits of G 503 Thesis.
2. Completion of three terms of G 507 Graduate Seminar or one term of G 407 Senior Seminar and two terms of G 507 Graduate Seminar, as directed by the faculty.
3. Completion of the Advanced Graduate Record Examination in Geology taken before the second term of regular admission; scores will be evaluated for deficiencies.
4. Presentation of a thesis.
5. Completion of a final oral examination (thesis defense) taken before the end of the sixth week of the final term in residence.
Master of Arts in Teaching or Master of Science in Teaching degree requirements:

1. Completion of at least 27 credits in graduate level courses in Earth Sciences, including one credit in graduate seminar (G 507). A maximum of 9 credits will be allowed in courses numbered G 501 and G 505.

2. Completion of the Advanced Graduate Record Examination in Geology taken before the second term of regular admission; scores will be evaluated for deficiencies.

3. Completion of a field-based project, and a final oral examination.

4. Students must also meet requirements of the School of Education.

School of Social Work

As you know, the School of Social Work was the first graduate program at Portland State. Gordon Hearn was the founder of the School and served as the dean until his retirement. Bernard Ross assumed the deanship position last year. Under Dean Ross' leadership the Faculty of the School undertook a rather extensive review of the curriculum. Basically, three actions developed as a result of this review.

1. Some revisions in course descriptions were proposed to reflect current course content. These revisions are currently before the Graduate Council.

2. The Faculty reaffirmed its desire to have a curriculum which provided for concentrations in direct service and in social welfare planning.

3. Some minor modifications were made in the basic program.
   a. The total number of required hours remains unchanged at 84.
   b. Six course numbers (SW 560-565) have been requested to reflect the present curriculum required for students concentrating in social welfare planning. Historically, planning students enrolled in a special section of SW 550-555. The same number was shared by the direct service concentration, causing some mixup. Although these courses have been taught in the curriculum for a number of years, the new numbers will reduce student registration complications.
   c. Two new required courses have been added to the curriculum. These are SW 535, Society and Social Behavior and SW 536, Membership Groups and Individual Behavior. The content in these courses was previously located in a human behavior sequence (SW 511, 512, 513) which is being dropped from the curriculum.
   d. A course in Pathology (SW 533) has been dropped as a required course but it remains in the curriculum on an elective basis.
   e. A course in Social Welfare Policy Analysis (SW 524) has been moved from an elective to a requirement.
Proposed Program

The following program represents degree requirements:

### First Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW 550, 551, 552:</td>
<td>Introduction to Theory of Social Work Practice</td>
<td>6</td>
</tr>
<tr>
<td>or</td>
<td>SW 560*: Introduction to Community Organization and Social Planning</td>
<td>2</td>
</tr>
<tr>
<td>SW 561*:</td>
<td>Social Planning</td>
<td>2</td>
</tr>
<tr>
<td>SW 562*:</td>
<td>Social Administration</td>
<td>6</td>
</tr>
<tr>
<td>and</td>
<td>SW 585, 586: Social Welfare Research</td>
<td>4</td>
</tr>
<tr>
<td>SW 520:</td>
<td>Social Welfare Services and Policies</td>
<td>2</td>
</tr>
<tr>
<td>SW 530, 531:</td>
<td>Human Psychosocial Organization</td>
<td>4</td>
</tr>
<tr>
<td><strong>SW 535</strong>:</td>
<td>Society and Social Behavior</td>
<td>2</td>
</tr>
<tr>
<td><strong>SW 536</strong>:</td>
<td>Membership Groups and Individual Behavior</td>
<td>2</td>
</tr>
<tr>
<td>SW 500:</td>
<td>Field Instruction</td>
<td>18</td>
</tr>
<tr>
<td>SW Electives</td>
<td></td>
<td>4</td>
</tr>
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<td><strong>Subtotal</strong></td>
<td></td>
<td>42</td>
</tr>
</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW 553, 554, 555:</td>
<td>Advanced Theory of Social Work Practice</td>
<td>6</td>
</tr>
<tr>
<td>or</td>
<td>SW 563*: Interorganizational Analysis</td>
<td>2</td>
</tr>
<tr>
<td>SW 564*:</td>
<td>Legislative Action and Policy Development</td>
<td>2</td>
</tr>
<tr>
<td>SW 565*:</td>
<td>Social Service Delivery Systems</td>
<td>6</td>
</tr>
<tr>
<td>and</td>
<td>SW 501: Research I, II or SW 503: Thesis</td>
<td>4</td>
</tr>
<tr>
<td>SW 521, 522:</td>
<td>Social Welfare Services and Policies</td>
<td>4</td>
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<td>SW 524:</td>
<td>Social Welfare Policy Analysis</td>
<td>2</td>
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<td>SW 500:</td>
<td>Field Instruction</td>
<td>8</td>
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<tr>
<td>SW Electives</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td>42</td>
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</table>

**TOTAL HOURS 84**

*Formerly taught as a section of SW 550 - SW 555

**New Courses
PORTLAND STATE UNIVERSITY
PROPOSAL FOR CHANGE IN EXISTING PROGRAM

Request for changes in Earth Sciences Department Graduate Programs requirements

Reproduce existing catalog statement in full:

GRADUATE PROGRAMS

The Earth Sciences Department offers graduate work leading to the Master of Arts or Master of Science degrees as well as the Master of Arts in Teaching or Master of Science in Teaching degrees.

The M.A./M.S. program is designed to train geology students beyond the baccalaureate degree for professional employment or further graduate work at the doctoral level. Options are available in classical areas of specialization, and in engineering and environmental geology, as well as in joint fields with other departments.

To be admitted to the graduate degree program, the student must have a baccalaureate degree in geology, or its equivalent as determined by the departmental graduate committee. It is recommended that the General and Advanced* Graduate Record Examination be taken before admission.

Degree Requirements:

University master's degree requirements are given on page 41. Specific departmental requirements for the M.A./M.S. are:

1) Completion of at least 24 credits in the field of geology of which 18 credits must be in 500-level courses.
   (a) At least 9 of these credits must be in courses numbered 6 510 or higher.
   (b) A maximum of 9 credits will be allowed for courses numbered 6 501 and 6 505.
   (c) Students must complete at least 6 but no more than 9 credits or 6 503 Thesis.
2) Completion of three terms of 6 407 Graduate Seminar or one term of 6 407 Senior Seminar and two terms of 6 507 Graduate Seminar, as directed by the faculty.
3) Completion of the Graduate Record Examination in Geology taken before the second term of regular admission; results will be used for advising purposes.
4) Presentation of a thesis.
5) Completion of a final oral examination (thesis defense) taken before the end of the sixth week of the final term in residence.

Masters of Arts in Teaching or Master of Science in Teaching degree requirements:

1) In addition to University master's degree requirements listed on page 41, candidates must complete an approved program including 27 credits in graduate-level courses in earth sciences. These
The Graduate Record Examination in Geology must be taken before the second term of graduate work (See Degree Requirements).

Reproduce proposed catalog statement in full:

GRADUATE PROGRAMS

The Earth Sciences Department offers graduate programs leading to the Master of Arts or Master of Science degree in Geology, and to the Master of Arts in Teaching or Master of Science in Teaching degree in Earth Sciences.

The M.A./M.S. program is designed to train geology students beyond the baccalaureate degree for professional employment or for advanced graduate work. The M.A./M.S. program is intended for teachers in secondary schools and community colleges.

To be admitted to a graduate degree program, the student must have a baccalaureate degree in geology, or its equivalent, as determined by the departmental graduate committee. It is recommended that the Advanced Graduate Record Examination in Geology be taken before admission.

Degree Requirements

University master's degree requirements are given on page 41. Specific departmental requirements for the M.A./M.S. are:

1) Completion of at least 24 credits in the field of geology of which 18 credits must be in 500-level courses.
   a) At least 3 of these credits must be in courses numbered 6 510 or higher.
   b) A maximum of 9 credits will be allowed for courses numbered 6 501 and 6 516.
   c) Students must complete at least 3 but no more than 5 credits of 6 502 Thesis.

2) Completion of three terms of 1 417 Graduate Seminar or one term of 6 407 Senior Seminar and one term of 6 597 Graduate Seminar, as directed by the faculty.

3) Completion of the Advanced Graduate Record Examination in Geology taken before the second term in the graduate admission classes will be evaluated for deficiency.

4) Presentation of a thesis.

5) Completion of a final oral examination (thesis defense) given before the end of the eighth week of the term in residence.
Catalog Change Proposal

Master of Arts in Geology or M.S. in Science & Teaching Program

Requirements:

1. Completion of at least 67 credits in graduate level courses in Earth Sciences, including one credit in graduate seminar (6507).
   A maximum of 9 credits will be allowed in Courses numbered 6 561 and 6 563.

2. Completion of the Advanced Graduate Record Examination in Geology
   Taken before the second term of regular admission; scores will
   be evaluated for deficiencies.

3. Completion of a Field-based Project, and a final oral examination.

4. Students must also meet requirements of the School of Education.

Justify the proposed program changes:

Items underlined by dashed line have been added. Reference to 1 program
options have been deleted. Eliminated recommendation of general graduate
record exam before admission; require equivalent of bachelor's degree;
require Advanced Graduate Record Examination in Geology, and require
Field based project. These changes are made to upgrade our graduate
programs, especially the M.A.-M.S. program, which will parallel our
M.A.-M.S. program.

Request prepared by

Approved by Unit (i.e. Dept.)
Curriculum Committee

Approved by Department Head

Approved by College/School
Curriculum Committee

Approved by College/School
Dean

Date 3/16/68

Date 2/12/68

Date 2/12/68

Date 2/12/68
PORTLAND STATE UNIVERSITY

PROPOSAL FOR CHANGE IN EXISTING PROGRAM
GRADUATE SOCIAL WORK MAJOR

Submitted by: School of Social Work

We request the following change in the Graduate Program Requirements for the Major

Existing Program

GRADUATE PROGRAM

Graduate education in social work demands the capacity to undertake a rigorous program of academic and field study and to tolerate a reasonable amount of stress. Preferably, undergraduate preparation should emphasize a broad base in the arts and sciences with particular attention to behavioral sciences and humanities. Since skill in social work relies heavily on communication, literacy and facility in self expression are requisites.

The two-year graduate program leading to the Master of Social Work degree prepares for competent performance of advanced direct service roles and for community planning functions. Programs in social work make up the continuing education and community education arm of the school.

The Regional Research Institute for Human Services provides opportunities for student research.

Field practicum, a required part of the program, provides a carefully directed educational experience. Students are placed under the instruction of a professional social worker in a variety of governmental and voluntary social work and non-social work settings, such as public health and public welfare departments, schools, juvenile correctional agencies, child care and family service agencies, psychiatric hospitals and clinics, and agencies concerned with community development and planning.

The School of Social Work carefully assesses the applicant’s potential for professional social work. This evaluation of the applicant’s aptitude and personal capacity is made by the faculty on the basis of prior academic record references and a personal written statement as outlined in the “Instructions to Applicants” which accompanies the “Application for Admission” to the School of Social Work. A personal interview and/or testing such as the Miller’s Analogies may be required.

Students are admitted for the fall term only. Applications may be made at any time but should be submitted before March 1 for admission the following fall.

Additional information, including a copy of the School of Social Work Bulletin and application forms, may be obtained from the Director of Admissions, School of Social Work, Portland State University, P.O. Box 751, Portland, Oregon 97207.

Degree Requirements

University master’s degree requirements are listed on page 41. The Social Work graduate student normally completes 84 credits including 36 credits in field instruction. With the approval of the faculty adviser and instructor, specific courses in other departments of the University may be taken as electives. Normally, the program of study is completed within two academic years. However, a limited number of students are permitted to enter a pre-planned three-year or four-year program of study. Continuation beyond the first year is judged on the basis of professional qualifications as demonstrated in class and field during the first year. The last 36 credits must be taken in residence. Prior to registering for the last 24 credits of graduate study, the student must apply for advancement to candidacy. He or she consults with a faculty adviser during the fall term of the second year regarding procedures for making application.

A research practicum, an individual thesis, or participation in a group research project is required.

Recommendation for graduation is made by the graduate coordinator when, in a final comprehensive evaluation, it is determined that the student has successfully completed his or her approved program.
Proposed Program

The following program will guide the student in meeting degree requirements

First Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>SW 550, 551, 552</td>
<td>Introduction to Theory of Social Work Practice</td>
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or

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>SW 561: Social Planning</td>
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<tr>
<td>SW 562: Social Administration</td>
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and

<table>
<thead>
<tr>
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<th>Hours</th>
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<tr>
<td>SW 585, 586</td>
<td>Social Welfare Research</td>
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<td>SW 520: Social Welfare Services and Policies</td>
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<tr>
<td>SW 530, 531</td>
<td>Human Psychosocial Organization</td>
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<tr>
<td>SW 535: Society and Social Behavior</td>
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<td>SW 536: Membership Groups and Individual Behavior</td>
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<tr>
<td>SW 500: Field Instruction</td>
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<td>Social Work Electives</td>
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Sub Total 42

Second Year

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<tr>
<th>Course Code</th>
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<tr>
<td>SW 553, 554, 555</td>
<td>Advanced Theory of Social Work Practice</td>
<td>6</td>
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or

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>SW 563: Interorganizational Analysis</td>
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<tr>
<td>SW 564: Legislative Action and Policy Development</td>
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<td>SW 565: Social Service Delivery Systems</td>
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</table>

and

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>SW 501: Research I, II or SW 503: Thesis</td>
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<tr>
<td>SW 521, 522: Social Welfare Services and Policies</td>
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<td>SW 524: Social Welfare Policy Analysis</td>
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</tbody>
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Sub Total 42

TOTAL HOURS 84
Rationale:

To reflect minor changes made in the curriculum during academic year 1977-78. Further, the course requirements are not currently listed in the Portland State Bulletin.

Request Prepared by Norman L. Wynn Date 4/28/78

Approved by School Curriculum Committee L. Wynn Date 5/02/78

Approved by Dean Bernard R. Date 5/02/78

Approved by College/School Curriculum Committee

Norman L. Wynn Date 5/02/78

Approved by College/School Dean Bernard R. Date 5/02/78