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MEETING THE DEMANDS FOR NEW DEGREE PROGRAMS AND COURSE OFFERINGS: THE EXPERIENCE AT MARYLAND

I. E. Strand and F. E. Bender

During the past fifteen years, many changes have taken place in the curriculum of the Department of Agricultural and Resource Economics, University of Maryland. Twelve new courses have been added, ten courses dropped and a new non-thesis Master's degree developed since the 1963-64 academic year.

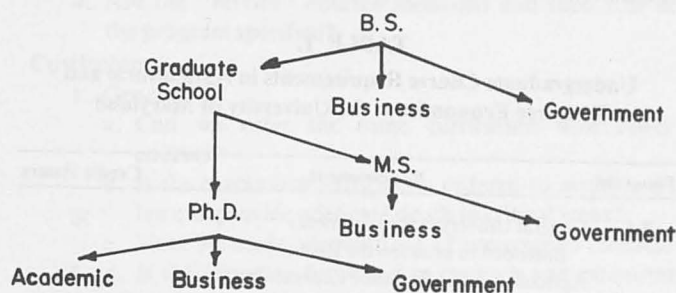
These changes have taken place to a large degree in response to continuing review by our own faculty and a series of outside reviews (e.g., the Five Year Graduate Review conducted in 1970, a review of the Department at the request of the College of Agriculture Administration in 1971, and a recently completed review of teaching, research and extension conducted in January, 1978). The continuing challenge of the Department's curriculum was expressed on the first page of the document prepared for the 1971 College of Agriculture review:

"The Department of Agricultural and Resource Economics offers resident instruction leading to the B.S., M.S., and Ph.D. degrees, and conducts comprehensive and effective research and extension programs . . . The resident teaching program is organized to enhance the ability of students to think and to strengthen their will to critically evaluate matters of importance to themselves and to society, as well as to provide them with the specialized tools and facts of the field . . . Since important economic problems arise in any dynamic society, the program of this Department must remain flexible in order to accommodate a continuous flow of worthwhile contributions. The Department must continuously examine its program areas in order to maintain the proper allocation of resources within and between the areas if it hopes to utilize optimally its efforts in a changing society."

It is within this framework of anticipating the needs of students and the society that our teaching program has been modified over the years.

THE CURRENT DEPARTMENTAL PHILOSOPHY AND CURRICULUM

The Department has repeatedly examined its program of resident instruction within the framework of anticipated needs of its students. The following diagram indicates the possible educational paths that a student in agricultural and resource economics might take.



The three terminal activities listed in the diagram (viz., business, government, and academic) illustrated the division of emphasis of a student's program. Thus, in the case of business emphasis, we are considering the individual who is within a firm or advises firms (such as an extension agent) and therefore is interested primarily in microeconomic problems and the decisions of individual firms. On the other hand, in an emphasis of government as a vocation, macroeconomic and industry problems will tend to be more important. In an academic setting or when dealing with environmental problems, both micro and macro training will be vital. In no case should a student be devoid of either micro or macro training.

Given the possible paths that a student could take and the uncertainty of taking any specific path, it becomes critical to define academic programs that enable a student to follow his anticipated path, while at the same time, providing the necessary broad base and flexibility that permits a change in direction without imposing an inordinate penalty.

With these general objectives in mind, the following statements were developed for each degree level.

The B. S. Program

The B.S. program should enable the individual to fit within a number of circumstances. It should enable him to express himself both orally and in writing. It should provide sufficient exposure to his cultural environment and heritage (through courses in history, sociology, psychology, etc.) so that the individual does not attempt to work in a virtual vacuum of ideas. In addition, a program in agricultural and resource economics requires the acquisition of certain needed tools.

Regardless of the eventual choice of the individual (i.e., business, government, or graduate school), he should be able to read and interpret research reports. This requires some instruction in statistics. In addition, since nearly all economics has some association with accounting, this training is also required. Although all students do not decide to go on to graduate school, it is felt that none should be precluded that option by our program. To that end, calculus, which is perceived as an essential tool in graduate training, is required early in the program and reinforced by its use in junior and

senior courses. A minimum exposure to micro- and macro-economic theory is also needed to enable the student to tackle economic problems with a strong foundation in economic principles.

Beyond these minimum skills, the Department feels that it need not concern itself. The program of coursework currently offered in this Department meets these minima and is shown in Table 1. The student and advisor can select the remaining courses in view of the goals of the student. Four major undergraduate options are currently available: Agribusiness, Agricultural Economics, International Agriculture, and Resource Economics. A fifth, Rural Real Estate, will soon be offered.

TABLE 1.
Undergraduate Course Requirements in Agricultural and Resource Economics at the University of Maryland

Program	Requirement	Credit Hours
B.S.	General University Requirements (intended to broaden the student)	30
	Agricultural and Resource Economics (Price Theory)	3
	Science	6
	Accounting	3
	Economics	12
	Statistics	3
	Mathematics through calculus	9
	Technical Agriculture	9
	Departmental Option (Agribusiness, Agricultural Economics, International Agriculture, Resource Economics, and Rural Real Estate)	12-21
	Electives	24-33
	Total	120

The Graduate Program

Both the M.S. and Ph.D. programs discussed assume that the student has completed a B.S. program as described above and shown in Table 1. Students without this background would be required to make up these deficiencies *without graduate credit*.

The M.S. Program: This level of training should produce an individual who can recognize and solve problems in economics with some minimum level of guidance or supervision. This means a solid foundation in economic principles with sufficient training in statistics and mathematics to read, understand and apply to similar problems the techniques illustrated in the professional journals.

The M.S. program of courses outlined in Table 2 is designed to provide a core of courses necessary of all students. Additional courses may be taken as desired without endangering the needed minimum balance of training.

It is clear that the M.S. (thesis) program has limited flexibility. Given the twin constraints that a minimum of 12 hours must be from this Department and that a minimum of 12 hours must be at the 600 level or above, it is very difficult to define a program that will provide the minimum needed skills and simultaneously provide any degree of flexibility.

In contrast, the nonthesis M.S. program can provide the necessary minimum skills and at the same time provide a considerable degree of flexibility in supporting coursework.

The Ph.D. Program: Training at this level should produce an individual capable of defining economic problems, developing the approach and solution, and presenting the results in a clear,

TABLE 2.
Graduate Course Requirements in Agricultural and Resource Economics at the University of Maryland

Program	Credit Hours	Credit Hrs. at 600 level
M.S. (thesis option)		
Agricultural and Resource Economics	12	
Economics		3
Microeconomics (600 level)	3	
Macroeconomics (400 level or 600 level)	3	
Statistics	3	
Other	3	
Total	24	12 (Required)
M.S. (nonthesis option)		
Agricultural and Resource Economics	12	
Economics		3
Microeconomics (600 level)	3	
Macroeconomics (400 level or 600 level)	3	
Statistics (400 level or 600 level)	3	
Other	12	
Total	33	18 (Required)
Ph.D. —		
Agricultural and Resource Economics		
Advanced Production Economics	3	3
Advanced Demand Analysis	3	3
Quantitative Methods	3	3
Other	6	6
Economics		6
Microeconomics	6	
Macroeconomics	3	3
Statistics	6	6
Other	18	3
Total	48	33

concise report (probably written) *without guidance or supervision*. Such a program would require rigorous training in depth in economic theory coupled with sufficient facility with tools and techniques (e.g., statistics, mathematics, sociology, linear programming, etc.) to apply not only what others have developed but to develop new methods where needed. The training in economic theory would have to include micro-economic theory and macroeconomic theory. There must be a balanced introduction into such topics as monetary theory, economic development, trade, etc.

The outline of core courses for the Ph.D. program presented in Table 2 assumes the B.S. program currently available in this Department as the foundation training.

The proposed Ph.D. program would enable the student to tackle a wide variety of research or job situations. The training is sufficiently broad that the student is not "locked in" to a limited horizon. At the same time, the courses specified provide a rigor that ensures that the student will receive an adequate depth of training.

The program offers considerable flexibility. In fact, there is a danger of too much flexibility in that the unspecified 18

graduate hours are nearly an M.S. program of coursework. There is a possibility of a student concentrating all of his flexible hours into a specific field (e.g., nutrition).

THE DEPARTMENTAL EXPERIENCE

The previous section provided a brief statement of Departmental goals for resident instruction and a summary of the current degree programs. These programs are in a continuing state of evolution. However, recent enrollments reflect the benefits of a careful analysis of student goals and the delineation of courses and programs designed to meet these anticipated needs.

Of course, as programs and individual faculty interests were expressed, specific course needs emerged. From 1963-64 until present, 12 new courses have been developed while 10 have been dropped. The areas of expansion have been in the environmental, resource and international areas, whereas the reductions have come principally at the expense of marketing. To a large degree, this results from the rapid growth of government and concomitant reduction of the relative share of agriculture — especially in the Mid Atlantic Region. Government job opportunities in the area of environmental resources and international work have been particularly bright compared with those in the traditional marketing sectors.

The other major change within the Department has been the addition of a nonthesis Master's degree. The pressure for continuing education and advanced degrees in governmental programs is, to a large degree, responsible for this program. Full-time government employees or, conversely, part-time students, represent a large proportion of our graduate enrollment (Table 3). The non-thesis program is ideal for these students since the rigorous, time-consuming thesis project is by-passed. In some respects, it is also beneficial to our graduate program in that larger graduate classes and students with practical experience are obtained.

Departmental efforts reflected in the growth of courses from 33 to 35 (6%) and student enrollments (over 200%), are now suffering from their success. Enrollments have grown to the point where teaching has become a serious burden, draining resources from the research and extension programs. Our teaching loads (weighted credit hours per teaching equivalent) have nearly doubled (Table 4).

In light of this situation, the Department developed the following list of questions to assist the outside review team

which visited us in January 1978 to examine the Department's program of resident instruction:

Objectives:

1. How much freedom should the individual exercise over course content? Is it the same for required courses as for courses not required?
2. Is the Department reaching its objectives of providing equal opportunity to higher education?
3. Should the teaching program stress intensity and depth or breadth of topics?
4. Are the "service" courses identified and their role in the program specified?

Curriculum:

1. General
 - a. Can we offer the same curriculum with fewer courses?
 - b. Is the curriculum sufficiently ordered to avoid overlap and provide adequate depth in critical areas?
 - c. Have we made adequate use of prerequisite courses?
 - d. Is the expertise developed in research and extension being effectively transmitted to the classroom?
 - e. Is the Department making effective use of the courses and faculty available in other departments on campus?
 - f. What role should cross-listing of courses play in the teaching program?
2. Graduate
 - a. Are we effectively competing for top quality graduate students? How can we tell?
 - b. How do our admission policies compare with other Departments on this campus and at other institutions?
 - c. Should we require GRE's for graduate admission?
 - d. How well does the graduate program compare to others in terms of quality?
3. Undergraduate
 - a. How should we recruit undergraduates?
 - b. Is it possible to draw more students through an introductory farm management course?
 - c. How well does the undergraduate program compare to others in terms of quality?

Constraints

1. What are the effective constraints on the quality and breadth of the graduate and undergraduate programs?

TABLE 3.
Number of students enrolled during each of the past 7 years^a

Academic Year	M.S.		Ph.D.		TOTAL	
	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
1970-71	20	25	34	48	54	73
1971-72	20	16	30	43	50	59
1972-73	27	19	30	48	58	67
1973-74	40	24	33	48	73	72
1974-75	56	29	31	48	87	67
1975-76	53	53	24	49	77	102
1976-77	53	56	29	46	82	102
Fall 1977	27	21	11	17	38	38

^a The numbers indicate total of students in the fall, spring and summer semesters. Thus, there exists double counting and possibly triple counting.

TABLE 4.
Student Enrollment in Classes and Weighted Credit Hours per Full-time Equivalent Offered
by the Department of Agricultural and Resource Economics — 1963 to 1978

	Undergraduate Enrollment	Graduate Enrollment	Total Enrollment	Total Weighted Credit Hours per FTE ^c
1963-64	200	161	361	
1964-65	172	183	355	
1965-66	230	169	399	805
1966-67	193	190	383	783
1967-68	185	223	408	846
1968-69	156	181	337	707
1969-70	222	177	399	754
1970-71	221	155	376	508
1971-72	537	94	631	914
1972-73	711	110	821	896
1973-74	814	150	964	851
1974-75	967	163	1,130	1,399
1975-76	733 ^a	181	914	1,152
1976-77	915	266	1,181	1,515
1977-78 (est) ^b	858 ^b	145 ^b	1,003 ^b	^d

^a In the fall of 1975, the decision was made, due to limited teaching faculty, to teach AREC 240 only in the fall semester. The average spring enrollment of about 260 was thus lost in the spring 1976 semester and only partially picked up in the fall of 1976 with an enrollment of 356.

^b Based on Fall 1977 enrollments, Spring 1978 pre-registration and last Summer's (1977) enrollment.

^c Weights are: lower undergraduate credit = 1, upper undergraduate = 1.5, graduate credits = 2, research credits = 3.

^d — Not available

2. Budgetary

- Can we define a full-time teaching load? How does it compare with a full-time research or extension load?
- How does the Department teaching load compare with similar institutions and with other departments at UM?
- Is the teaching budget sufficient to support the curriculum as it now exists?
- Is there sufficient funding for enrichment programs in coursework?

3. Physical

- Are we constrained to current enrollment by inadequate classroom space?
- Is the quality of graduate work constrained by the assignment of office space?

4. Incentive — How do we recognize and reward superior teaching?

Optimal Allocation:

- What is the optimal size of our undergraduate program given our teaching resources? Is it zero?
- What is the optimal size of our graduate program given our teaching resources?
- Could we expand the graduate program through grants if we could switch to 10-month faculty appointments?
- Are teaching assignments organized to place the best lecturers in critical courses that could draw students?
- Are the graduate teaching assistantships used in an efficient manner?

We think that the concern shown in these questions with regard to resource constraints reflects the success that the Department has achieved in defining and meeting student needs. Our next major task appears to be one of acquiring the resources to maintain and improve the program which has been so well received.