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A STUDY OF THE PHYSICS CURRICULUM OF
OUACHITA BAPTIST UNIVERSITY

A SPECIAL STUDIES PROJECT

for

HONORS PROGRAM

H490

by

James McCarty

Spring Semester, 1968

A STUDY OF THE PHYSICS CURRICULUM OF
OUACHITA BAPTIST UNIVERSITY

The purpose of this paper is to compare the physics curriculum of Ouachita Baptist University with those of several other colleges with the ultimate goal of finding what changes, if any, should be made. Four colleges and universities were used for comparison. Hendrix College is a Methodist college which had an enrollment of 757 during the 1965-66 school year.¹ State College of Arkansas is a state-supported school with 3,129 students during the same year.² Little Rock University is a private school which is aided by the city of Little Rock, Arkansas. It had 2,851 students in 1965-66.³ Southwestern at Memphis is a Presbyterian college with 993 enrolled.⁴ Ouachita itself had 1,785 students in the 1965-66 school year, and is, of course, a Baptist school.⁵

Before proceeding further, it would be helpful to consider exactly what type of physics department is to be

¹"Colleges and Universities," The Americana Annual: 1968 (46th ed.), 176.

²Ibid., 172.

³Ibid., 178.

⁴Ibid., 183.

⁵Ibid., 181.

desired at Ouachita. Certainly a complete program of all potentially useful courses and intensive research is financially impossible. The physics department must, however, satisfy the basic needs of three types of individuals: those taking physical science as a part of the General Education program, those desiring a general background in physics as an aid in their chosen field, and those planning to major in the subject. The first two requirements are fairly easily filled although they do make heavy contributions to the teaching loads of the professors. The physics majors should be prepared sufficiently well either to qualify for a job upon graduation or to be admitted and to do reasonably well in graduate school.

Since most physics majors today plan to attend graduate school, the main emphasis of this paper will be on graduate school preparation. Those planning to work after college have very similar needs anyway. The entrance requirements of a number of graduate schools were studied and compared. In general the following courses were required: thermodynamics, electricity and magnetism, atomic and nuclear physics, optics, and mechanics. Some schools included solid state physics, quantum mechanics, and modern physics.

The curriculum of the five colleges are quite naturally very similar, but they do have definite differences. All have courses in general physics, electronics, electricity and magnetism, optics, and mechanics. Only Southwestern fails to offer atomic and nuclear physics. Hendrix has

thermodynamics, quantum mechanics, and advanced electricity and magnetism in addition to these. S. C. A. has several radiological courses in connection with its Civil Defense program. Nonmajors may take a simplified general physics course as well as one on basic electrical theory. A special class is taught for secondary teachers. Since the school owns a good telescope, S. C. A. can offer astronomy. The principal other courses for majors include thermodynamics, modern physics, theoretical physics, and acoustics. L. R. U. also has simplified electricity and general physics courses. Majors may take engineering problems, thermodynamics, acoustics, and solid state physics. Southwestern offers a course called machine shop theory. The astronomy field is strong with classes in both astronomy and astrophysics. Thermodynamics and modern physics are also taught. Ouachita offers applied physics for nonmajors. One of its courses, meteorology, is not taught at any of the other colleges studied. Acoustics is combined with the optics course. The relative levels of these course are unknown. It can only be assumed that courses with the same name are similar in the material covered and the degree of competence achieved.

A study of these curricula reveals two courses which are needed at Ouachita--thermodynamics and modern physics. Modern physics is offered by two of the schools studied. It is, you may recall, one of the often required courses for graduate school. This course can be partially made

up for in other courses, however, and is not critically needed. Thermodynamics is much more important. It is offered by all four other colleges and is required by most graduate schools. Although a student does learn a lot of thermodynamics in physical chemistry, a more concentrated and complete course is needed.

This student's recommendation, therefore, is to add a course in thermodynamics and consider adding one in modern physics to the present curriculum. This might not be possible with the present faculty, especially since it must teach courses in physical science and German in addition to physics. However, the inclusion of these courses in the curriculum should be a future goal if an effective physics department is to be maintained.

An even better method of improving the department would be to make an arrangement with Henderson State College to teach only certain of the junior and senior courses at each college. Courses not offered at one school would be taken at the other. This would give the students a greater choice of courses without either school having to enlarge its faculty. The author feels that this is the best solution, as it would give the students better preparation at both schools without costing more.

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