

# A Survey of 5-Year and Cooperative Chemical Engineering Curricula of 1963-1964

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A survey was made of the undergraduate chemical engineering curricula of schools having programs that require either five years of academic course work or cooperative work programs. The results were compared with those from similar surveys of four-year curricula by Schmidt (2) and Thatcher (3).

A list of schools falling into the two categories was compiled from catalogs, bulletins, and the 31st Annual Report of the Engineers' Council for Professional Development. Ten were included in the five-year category: Brigham Young, Columbia, Cornell, Florida, Louisiana Polytech, Louisville, Minnesota, Ohio State, Rice, and Virginia. Seventeen were in the co-op category: Auburn, Cincinnati, Denver, Detroit, Drexel, Fenn (now Cleveland State), Florida, Georgia Tech, I.I.T., Louisville, Missouri Mines, New Mexico State, Northeastern, Northwestern, R.P.I., Tennessee, and V.P.I.

An initial breakdown of subject matter was made with the same subject classifications used by Schmidt and by Thatcher so that direct comparisons were easy. All credits were reported in semester hours. This initial information was sent to each of the respective schools with a request that it be checked and appropriately corrected. The corrected forms were then used for the final tabulations.

Separate summaries were made for schools having curricula that require five years of course work and one for those having a cooperative work program. The results for the major subject classes are shown in Table I, along with those from the Schmidt and Thatcher surveys. A complete summary with detailed breakdown may be obtained from the author.

The following observations are offered:

1. The five-year curricula<sup>†</sup> have a higher number of credit hours than "four-year" curricula, but not in the proportion of 5 to 4.

\* The author is a member of the A.I.Ch.E. Committee on Undergraduate Curricula, and this survey was made under the Committee's auspices.

† The term "four-year" as used throughout the text applies to the data compiled by both Schmidt and Thatcher. It includes schools at which the students need an extra term and/or summer work to complete the baccalaureate requirements in four calendar years.

2. There is a higher emphasis on cultural courses by approximately eleven credits in the five-year curricula. The percentage of the curriculum devoted to cultural courses is 16% for the five-year schools of 1963-4 compared to 12% for the "four-year" schools of 1961-2. Twenty percent was suggested by the 1955 ASEE Committee on Evaluation of Engineering Education (1).
3. The total of mathematics, chemistry and physics is five credits higher for the five-year schools of 1963-4 than the four-year schools of 1961-2.
4. In chemical engineering subjects, the five-year curricula carry eight more credit hours than the four-year curricula. The increase is general and distributed, and it does not represent an increase in one particular subject area.
5. Cooperative curricula of 1963-4 show no statistically significant departures from the four-year curricula of 1961-2.

TABLE I. Average Semester-Hour Distribution in Four and Five-Year Curricula

	FOUR-YEAR		THIS STUDY	
	Ref.2	Ref.3	5-yr.	Co-op
Total Gross Credits	147.0	146.2	172.5	148.6
Mathematics	17.3	17.9	19.6	19.6
Chemistry	30.8	28.9	30.8	28.0
Physics	11.1	11.3	12.2	11.8
Graphics	4.7	3.8	3.1	4.5
Chem. Eng.	32.9	32.8	40.6	33.1
Materials,				
Mechanics	9.1	8.3	9.0	9.8
Elec. Eng.	5.0	5.0	6.3	5.0
Tech. Elect.	3.6	5.2	6.5	5.8
Other Technical	1.8	0.8	1.1	1.2
Cultural	14.7	17.2	28.2	17.7
Other non- Tech.	9.9	8.6	8.1	10.3

## REFERENCES

1. American Society for Engineering Education, Committee on Evaluation of Engineering Education, *J. Eng. Education*, 46, [1] 26-60 (1955).
2. Schmidt, A. X., *J. Eng. Education*, 50, [1], 65 (1959).
3. Thatcher, C. M. *Chem. Eng. Education*, 1962, [Sept.] 1-2.