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**COURSE OF STUDY IN ELECTRO-METALLURGY IN
LEHIGH UNIVERSITY.**

BY JOSEPH W. RICHARDS, PH. D.

The course of four years study in this subject, offered at Lehigh University, was drawn up by the writer, and is intended to give to the student a thorough grounding in the elements of physics and chemistry, to build on this a compre-

hensive study of electricity and metallurgy, and so to fit the graduate to enter the fields of electro-chemistry or electro-metallurgy with a fair knowledge of the fundamentals of both electrical and chemical science.

A plan of the course is annexed, showing the studies taken up, arranged in four characteristic groups. In each group, most of the studies first taken are required as preliminaries to the succeeding studies, and even where this is not the case, the relation is more or less close. The figures annexed in parentheses show the number of exercises per week, an exercise representing one hour of lecture or recitation, or two hours of drawing or blowpipe work, or three hours of other laboratory work.

As thus constituted, the course comprises the following number of hours instruction in the four years:

Culture Studies.—English Language, English and American Literature, Rhetoric, Literary Criticism, Essays, Orations, Public Speaking—192 hours; German or French—96 hours; Hygiene—32 hours; Economics—32 hours; Philosophy of Religion—16 hours.—(Professors Thayer, Ringer, Stewart, Stewardson and Dr. Estes.)

Mathematics.—Elementary Mechanics—80 hours; Advanced Algebra—32 hours; Plane and Spherical Trigonometry—32 hours; Analytical Geometry—80 hours; Calculus—80 hours.—(Professors Thornburg, Meaker, Lambert.)

Engineering Subjects.—Physics and Physical Laboratory—272 hours; Electricity and Magnetism, and Electrical Laboratory—128 hours; Alternating Currents, Dynamos and Motors and Dynamo Laboratory—256 hours; Transformers, Transmission of Power, Electric Lighting and Heating—96 hours; Strength of Materials, Boilers, Steam Engine—128 hours; Machine Construction and Mechanical Technology—each, 120 hours in summer school.—(Professors Franklin, Esty, Merri-man and Klein.)

Mineralogy.—Crystallography and Mineralogy—80 hours; Determinative Mineralogy with the Blowpipe—32 hours.—(Professors Frazier and Richards, and Mr. Landis.)

Metallurgy.—Metallurgical Drawing, Construction and Design—288 hours; General Metallurgy, Metallurgy of the Separate Metals, Problems, Metallurgical Laboratory—192 hours; Theory of Electrolysis, Electrometallurgy, Electrometallurgical Laboratory—128 hours; Blowpipe Assaying—32 hours; Ore Dressing—48 hours.—(Professors Frazier, Richards and Eckfeldt, Mr. Sullivan, Mr. Landis.)

Chemistry.—Lectures, Stoichiometry, Chemical Philosophy—112 hours; Qualitative Analysis—144 hours; Blowpipe Analysis—32 hours; Quantitative Analysis—480 hours.—(Professors Chandler, Shober and Ullman.)

Thesis.—Forty-eight hours work is assigned on the roster.

	CULTURE STUDIES.	MATHEMATICS AND ENGINEERING.	METALLURGY AND MINERALOGY.	CHEMISTRY.
ENTRANCE REQUIREMENTS.	English, American History, German or French.	Algebra, Geometry, Plane Trigonometry, Elementary Physics.		
FIRST YEAR.				
First Term.	English (3), Hygiene (2), German or French (3).	Elementary Mechanics (5).		Chemistry Lectures (2). Chemical Lab. (2).
Second Term.	English (2), Public Speaking (1), German or French (3).	Advanced Algebra (2), Trigonometry (2), Physical Lab. (1), Physics (2)		Stoichiometry (2). Qualitative Analysis (3).
Summer Term.		Constructive Elements of Machinery and of Electrical Apparatus (4 weeks).		
SECOND YEAR.				
First Term.	English (3), Public Speaking (1).	Analytical Geometry (5), Physical Lab. (1), Physics (3).	Crystallography (2), Drawing (3), Metallurgical Construction (1).	
Second Term.	English (2).	Calculus (5), Physical Lab. (1), Physics (3).	Mineralogy (3), Drawing (3), Metallurgical Construction (2).	Blowpipe Analysis (1).
Summer Term.		Mechanical Technology (4 weeks).		
THIRD YEAR.				
First Term.	English (1).	Strength of Materials (4), Boilers (1), Electrical Lab. (1), Electricity and Magnetism (2), Dynamos and Motors (2).	Determinative Mineralogy with the Blowpipe (1).	Chemical Philosophy (3). Quantitative Analysis (3).
Second Term.	Technical Reading, German or French (1).	Steam Engine (3), Electrical Engineering (2), Electrical Lab. (1), Alternating Currents (2).	Metallurgy Lectures (4), Metallurgical Problems, (1).	Quantitative Analysis (4).
FOURTH YEAR.				
First Term.	Economics (1).	Engineering Lab. (1), Electric Lighting (2), Electrical Lab. (1), Dynamo Lab. (2), Theory of Electrolysis (1).	Blowpipe Assaying (1), Metallurgy Lectures (4), Electro-Metallurgy Lab. (1).	Quantitative Analysis (3).
Second Term.	Economics (2).	Engineering Lab. (1), Electric Power (2), Dynamo Lab. (2).	Metallurgical Lab. (1), Metallurgical Design (2), Electro-Metallurgy (1), Ore-Dressing (3).	
THESIS (3), FOR DEGREE OF "ELECTROMETALLURGIST."				