

66. Gas Engineering.—Gas machinery; ovens and appliances for carbonization; recovery of by-products. *II*; (1). Professor PARR
Prerequisite: Chemistry 65. Registration in 66a is advised.
- 66a. Control Processes in Gas Manufacture.—Standardization methods and inspection. *II*; (1). Professor PARR
69. Metallurgical Laboratory and Assaying.—The fire assay of gold, silver, lead, and copper ores, mattes, and bullion; special experiments illustrating the underlying metallurgical principles; fluxes, slags, and charge calculations; practise in the use of coal, oil, and gas furnaces, and in the measurement of high temperatures. *I*; (2). Associate Professor MCFARLAND
Prerequisite: Chemistry 5a; Geology 20.
72. Paints, Oils, Turpentine, Varnishes, and Protective Coverings for Wood and Metals.—Lectures and laboratory. *I*; (2). Professor PARR, Dr. LAYNG
Prerequisite: Chemistry 5a and 14a-14b.
73. Asphalt, Tar, and Distillation Products.—Sources, characteristics, composition, and examination; binders and dust preventives used in road construction. (For students in highway engineering). *II*; (2). Professor PARR, Dr. LAYNG
Prerequisite: Chemistry 2a or 4.
76. Mineral Oils.—Fractionation, analysis, evaluation for fuel, lubrication and gas manufacture. *II*; (2). Professor PARR, Dr. LAYNG
Prerequisite: Chemistry 9a and 14a.
77. Composition and Classification of Coal.—Classification, changes in composition, weathering, spontaneous combustion, formation of mine gases. Lectures; assigned reading. *II*; (1). Professor PARR
Prerequisite: Chemistry 65.
78. Metallography.—Constitution and microstructure of metals and alloys and the relations between their properties, chemical and mechanical treatment, and structure. Lectures; reading; laboratory. *II*; (2). Associate Professor MCFARLAND
Prerequisite: Chemistry 7.
80. Elements of Gas Blowing.—A laboratory course in the construction and repair of glass apparatus. *II*; (1). Mr. ANDERS
Prerequisite: Two years' work in chemistry.
86. Chemistry of the Higher Order Compounds.—Complex compounds from the standpoint of the Valence Theory as developed by Werner. *II*; (2). Dr. STEARN
Prerequisite: Chemistry 9a, 9b, 14a-14b.
- 90-91. Chemical Inspection Trips.—Required for juniors and seniors in the courses in chemistry and chemical engineering. For the year 1919-20 the trips took place on March 29 to April 3, 1920. The expense involved will approximate fifteen to twenty-five dollars for each student. *II*; (*no credit*). Associate Professor MCFARLAND in charge
- 92a-92b. Chemical Literature and Reference Work.—Periods, leaders, journals. Required of juniors in chemistry and chemical engineering; required also of juniors who are majoring in chemistry. *I, II*; (1). Miss SPARKS
- 93a-93b. Journal Meeting.—Required of seniors and all graduate students in chemistry. All members of the staff of the department of chemistry are expected to attend. *I, II*; (1). Dr. BRALEY
95. History of Chemistry.—Lectures and assigned reading. *I*; (2). Professor NOYES