

兰州理工大学与特洛伊大学应用化学专业教学计划

Teaching plan of Applied Chemistry Specialty Major Lanzhou University of Technology & Troy University

一、培养目标和要求：

业务培养目标：本专业培养具备化学的基础知识、基本理论和基本技能，能在化学及与化学相关的科学技术和其它领域从事科研、教学、技术及相关管理工作的高级专门人才。

业务培养要求：本专业学生主要学习化学方面的基础知识、基本理论和基本技能与方法，受到科学思维和科学实验的训练，具有一定的科学研究、应用研究及科技管理的能力。

本 1-2-1 计划简要说明了获取特洛伊大学和兰州理工大学双学位的要求。

本计划的目的是为学生在国际的环境中成功的从事应用化学研究做准备。重要的课程内容主要包括：高等数学，无机及分析化学，有机化学，物理化学，精细化学品化学和聚合物化学及其相应的专业实验课程。

特洛伊大学有120年的历史，能够授予化学学士学位的学校。

兰州理工大学是位于中国西部地区甘肃省兰州市内的一所,拥有理工文专业的综合性大学，能够授予应用化学学士学位和硕士学位。

1. Cultivation Goal and Requirements

This 1-2-1 plan outlines the program requirements for a dual degree in Chemistry from Troy University and Lanzhou University of Technology.

The objective of this plan is to prepare students for training excellent chemical talented students with firm and extensive knowledge, powerful ability and high diathesis. Important areas of the curriculum include: Advanced Mathematics, Inorganic and Analytical Chemistry, Organic Chemistry, physical chemistry, Chemistry of Fine Chemicals, Principles of Polymer Synthesis, and the Experiment of Chemistry.

Lanzhou University of Technology can award both the baccalaureate and masters degrees in Applied Chemistry.

Lanzhou University of Technology was established in 1919 as Lanzhou Technical School. In 1958 the school was renamed Lanzhou Polytechnic Institute; and in that same year, after a merger with Gansu Communication College, the Institute was renamed Gansu University of Technology. In 1965, the University expanded its specialty curriculum when three specialties from Northeast Heavy-Machine Building Institute, and one specialty from Beijing Machine-Building Institute became a part of the University. The above specialties were a part of First Machine-Building Industry Ministry of China prior to transfer. Subsequent to the reorganization of the State Council of China in 1998, the University's administration is under the control of both the central and local government, with the local government having the major responsibility for operation. The University was renamed Lanzhou University of Technology in May of 2003, following approval by the Education Ministry of China.

Troy University was founded on February 26, 1887, when an act of the Alabama Legislature established *State Normal School, Troy* as an institution to train teachers for Alabama's schools. The school was renamed *Troy State Normal College* in 1893. The Normal College offered extension courses for teachers and granted teaching certificates until 1929, when the State Board of Education changed the charter of the institution and renamed it *Troy State Teacher's College*. Like many American universities, Troy State Teacher's College enjoyed one of its most prosperous periods of growth in the years following World War II, when returning veterans took advantage of the GI Bill. The enrollment of the College more than doubled and this growth led to the introduction of degree programs in disciplines other than education, most notably in business. In 1957, the State Board of Education recognized this expanded role and dropped "Teacher's" from *Troy State College's* name. The decade of the 1950s also marked the University's long relationship with the United States Military, as extension courses were offered on nearby bases, first at Fort Rucker, near Dothan; and later at Maxwell Air Force Base in Montgomery. A separate Troy State College teaching center was established at Fort Rucker in 1961, which evolved into the present-day Dothan Campus. A similar center, begun at Maxwell Air Force Base in 1965, led to the creation of the present-day Montgomery Campus. These programs were the forerunners of the modern University College division of Troy University, which operates all Troy University teaching sites outside of Alabama. In 1973, the University opened sites at military bases in Florida. Today, University College operates more than 60 sites in 17 U.S. states and 11 nations. In 1967, Gov. Lurleen B. Wallace appointed eight members to the newly established Troy State College Board of Trustees, removing the institution from the control of the State Board of Education. One of the first acts of the new board was to recommend the change of the name to *Troy State University*. The new name became official on Dec. 14, 1967. In 1975, the Phenix City Campus was opened as a branch of the main campus. In 1982, the Troy State University System was formed, as the campuses in Dothan and Montgomery were granted independent accreditation status. In April of 2004 the Board of Trustees voted to drop "State" from the University's name to better reflect the institution's worldwide mission.

二、学位要求

1-2-1计划为中国高素质学生服务。学生进入特洛伊大学学习专业课程，托福成绩至少500分(或相等的IELTS成绩)。如果托福成绩在475至500分之间，则学生应当在修ESL(非母语英语课程)的同时修专业课程，以作为过渡。

如果学生的正式TOFEL或IELTS成绩不是在抵达特洛伊之前由特洛伊大学通过电报系统直接获得，那么，该学生将必须参加英文水平考试，以决定该学生是修ESL(非母语英语课程)，还是可直接修专业课程。

1-2-1 学生需要在特洛伊大学修满 61 个学分，其中至少 23 个学分是专业课程学分才能获得特洛伊大学学士学位。

1-2-1 学生需要修满 167 学分(包含在特洛伊的完成的 61 学分才能获得兰州理工大学大学学士学位)。

学生在(进入特洛伊之前)兰州理工大学学习的第一年，必须成功修完下列课程且成绩不得低于“C”(70分)。高等数学，无机及分析化学，无机及分析化学实验，计算机导论。

如果在进入特洛伊之前，上述任何一门核心课程在第一年内在兰州理工大学未完成，学生将必须在特洛伊大学完成这些课程。

在特洛伊完成的、成绩需要在“C”及以下的课程是：英文写作 1 和英文写作 2(ENG1101 和 ENG1102)。

在特洛伊大学或兰州理工大学的任何课程成绩不及格，则必须重修。

1-2-1 学生回到国内的最后一学期，将需要完成一篇学位论文。论文题目将由兰州理工大学和特洛伊大学的教师共同选定并指导。

所有的学生必须按照特洛伊大学和兰州理工大学的规定完成所有课程和学分。特洛伊要求学生所有的课程和主要课程一样，成绩达到 2.0。

本计划是以 2006-2007 年教学计划为基础的。两所大学之间每一学年将彼此联络、核实计划情况；一旦有课程改变，将修正本计划。

II. Degree Requirements

The 1-2-1 freshmen to this program in China are advanced high-caliber students, and a TOEFL score of at least 500 (or the equivalent IELTS) must be achieved to take all academic courses or a score of 475 to “bridge”—take both ESL and academic courses simultaneously.

All students will be required to take an English placement exam upon arrival at TROY if an official TOEFL or IELTS score is not received directly from ETS prior to the student’s arrival. Results from this exam will determine placement in ESL or academic courses.

The 1-2-1 student will have 61 hours with at least 23 hours in Major Requirements at TROY to receive a TROY degree.

The 1-2-1 student will have 167 credit hours including 61 hours at TROY to receive a Lanzhou University of Technology degree.

The student’s first year at Lanzhou University of Technology prior to enrollment at TROY must include the following courses completed successfully with a grade no lower than the equivalent of “C”: Advanced Mathematics, Basics of Computer Application Inorganic and Analytical Chemistry, and the Experiment of Inorganic and Analytical Chemistry. Courses completed at TROY that require a “C” or better are English Composition I and II (ENG1101 and ENG1102).

Any course completed at TROY or Lanzhou University of Technology with a grade of “F” must be repeated.

1-2-1 students will be required to complete a thesis during their final semester in China. The thesis topic will be selected and research conducted with participation from faculty at both Lanzhou University of Technology and TROY.

All students must complete all curriculum and credit requirements from both TROY and Lanzhou University of Technology to earn degrees from their respective universities. In order to graduate from TROY, students must earn a 2.0 GPA in all college coursework as well as a 2.0 in all major courses.

The articulation plan is based on the 2006-2007 catalogs. Each university shall contact each other to verify the plan each academic year or to modify the plan if the curriculum changes.

三、1-2-1 项目应用化学专业教学计划与课程安排

III. Sample Schedule for 1-2-1 B.S. in Applied Chemistry Speciality

第一学年 (在兰州理工大学上课)

First academic year (at Lanzhou University of Technology)

学期 Semester	课程代码 Course Code	课程名称 Course Name	课时 Hours week/total	学分 Credit		备注 Notes
				中方 China	美方 U.S.A.	
第 一 学 期 Semester I	112403	思想道德修养与法律基础 Ideological & Moral Cultivation and Basics of Law	3/48	3	3 PHI 2204	中方必修课 Required course in China
	111101	英语综合 (一) Comprehensive English (1)	5/80	5	0	中方必修课 Required course in China
	109107	高等数学 B1 Advanced Mathematics B1	5.5/88	5.5	4 (4.88) MTH 1125	
	105303	计算机导论 Basics of Computer Application	3.5/56	3.5	3.11 IS 2241	
	113101	体育 (一) Physical Education (1)	2/30	1	2 HPR elective	
	112110-2	形势政策 A1-3 The word politics A1-3	3/48	3	(2.67) POL/ ECO elective	中方必修课 Required course in China
	203115	无机及分析化学(1) Inorganic and Analytical Chemistry (1) <i>(higher-level course used as substitute)</i>	4/64	4	3 (3.55) CHM 1142	
	203414	无机及分析化学实验(1) The Experiment of Inorganic and Analytical Chemistry (1) <i>(higher-level course used as substitute)</i>	1.5/24	1.5	1 CHM L142	
	202211	工程图学 E Engineering Graphics E*	2/32	2	1.77 Elective	
	小计(Total)		470	28.5	20.55	

第二学期 Semester II	111102	英语综合 (二) Comprehensive English (2)	5/80	5	0	中方必修课 Required course in China
	109108	高等数学 B2 Advanced Mathematics B2	7/112	7	4 (6.2) MTH 1126	
	105304	计算机语言 B The Language of Computer B	4.5/72	4.5	4 IS/CS 3343	
	112103	马克思主义基本原理 Marxist philosophy's principle	3/48	3	2.67 SOC 2275	中方必修课 Required course in China
	113102	体育 (二) Physical Education (2)	2/30	1	1.67 HPR elective	
	203116	无机及分析化学(2) Inorganic and Analytical Chemistry (2) <i>(higher-level course used as substitutes)</i>	3.5/56	3.5	3.11 CHM 1143	
	203415	无机及分析化学实验(2) The Experiment of Inorganic and Analytical Chemistry (2) <i>(higher-level course used as substitutes)</i>	2/32	2	1.77 CHML1143	
	033103	金工实习 B Metalworking Workshop B	2/2Weeks(64)	2	2 elective	
	112118	毛泽东思想、邓小平理论和三个代表重要思想概论 The philosophical thinking of Mao Zedong, Deng's Theory and the Important Thought of "THREE On-Behalf-Of"	3.5/56	3.5	3 (3.11) PHI 2203	中方必修课 Required course in China
	小计(Total)		560	31.5	22.22	
备注 Notes	中方必修课程还有:体育 (一) (二)、军训, 学生必须在第一学年进行相应选择学习 The other must courses are: PE I, II、 Military Training. Students must choose the relative courses to study.					

第二学年 (在特洛伊大学上课)

Second academic year (at Troy University)

学期 Semester	课程代码 Course Code	课 程 名 称 Course Name	课时 Hours week/ total	学分 Credit	
				中方 China	美方 U.S.A.
第 一 学 期 Semester I	英语 1101 ENG1101	英语写作(一) English Comp 1	3/54	5	3
	TROY1101	学校简介 Orientation	1/18	1	1
	化学 3342 CHM 3342	有机化学 I Organic Chemistry I	3/54	3.5	3
	化学 L342 CHM L342	有机化学 I 实验课 Organic Chemistry I Lab	1/36	1.5	1
	物理 2252 或物理 2262 PHY 2252 or 2262	普通物理 I Either General Physics I 或微积分物理 I or Physics with Calculus I	3/54	3	3
	物理 L252 或物理 L262 PHY L252 or L262	普通物理 I 实验课 General Physics I Lab 或微积分物理 I 实验课 or Physics with Calculus I Lab	1/36	1	1
	小计(Total)		252	15	12
第 二 学 期 Semester II	英语 1102 ENG1102	英语写作 (二) English Comp 2	3/54	5	3
	化学 3343 CHM 3343	有机化学 II Organic Chemistry II	3/54	3.5	3
	化学 L343 CHM L343	有机化学 II 实验课 Organic Chemistry II Lab	1/36	1.5	1
	物理 2253 或物理 2263 PHY 2253 or 2263	普通物理 II Either General Physics II 或微积分物理 II or Physics with Calculus II	3/54	3	3
	物理 L 253 或物理 L 263 PHY L253 or L263	普通物理 II 实验课 General Physics II Lab or 或微积分物理 II 实验课 Physics with Calculus II Lab	1/36	1	1
	生物 1100 BIO 1100	生物学原理 Principles of Biology	3/54	3	3
	生物 L110 BIO L110	生物学原理实验课 Principles of Biology Lab	1/36	1	1
	小计(Total)		324	18	15

Summer Semester I	历史/文化 His/Lit sequence	历史/文化 History or Literature, first course	3/54	3	3
	历史/文化 His/Lit sequence	历史/文化 History or Literature, second course	3/54	3	3
	小计(Total)		108	6	6

第三学年 (在特洛伊大学上课)

Third academic year (at Troy University)

学期 Semester	课程代码 Course Code		课程名称 Course Name	课时 Hours week/ total	学分 Credit	
					中方 China	美方 U.S.A.
第 一 学 期 Semester I	英语 2241 SPH2241		英语演讲 Speech	3/54	3	3
	化学 3381 CHM 3381		物理化学 I Physical Chemistry I	3/54	3.5	3
	化学 L381 CHM L381		物理化学 I 实验课 Physical Chemistry I Lab	1/36	1	1
	化学 3352 CHM 3352		生物化学 Biochemistry	3/54	3	3
	化学 L 352 CHM L352		生物化学实验课 Biochemistry Lab	1/36	1	1
	选修课 Choose one: ART 1133, DRA 2200, Or MUS 1131		选择一门文科教育或 基础的课程 Visual Arts, Introduction to Drama, OR Music Appreciation	2/36	3	2
	选修课 Choose one other: ART 1133, DRA 2200, Or MUS 1131		选择一门文科教育或 基础的课程 Visual Arts, Introduction to Drama, OR Music Appreciation	2/36	3	2
	小计(Total)			306	17.5	15
第 二 学 期 Semester II	化学 3382 CHM 3382		物理化学 II Physical Chemistry II	3/54	3.5	3
	任 选 其 中 一 门 One of	化学 4444 CHM 4444	高级无机化学 Advanced Inorganic Chemistry	3/54	3	3
		化学 4445 CHM 4445	仪器分析 Instrumental Analysis	3/54		
	任 选 其 中 一 门 One of	化学 L444 CHM L444	高级无机化学实验课 Advanced Inorganic Chemistry Lab	1/36	1	1
		化学 L445 CHM L445	仪器分析实验课 Instrumental Analysis Lab	1/36		

	历史/文化 His/Lit sequence	历史/文化 History or Literature, third course	3/54	3	3
	选修课 Select 3 hours from Area IV *International Scope	Many possible courses to choose from	3/54	3	3
	小计(Total)		342	13.5	13

第四学年 (在兰州理工大学上课)

Fourth academic year (at Lanzhou University of Technology.)

学期 Semester	课程代码 Course Code	课 程 名 称 Course Name	课时 Hours week/total	学分 Credit	
				中方 China	美方 U.S.A.
第 一 学 期 Semester I	203323	结构化学 Structure Chemistry	3/40	2.5	2.22
	203319	催化原理及应用 Principle & Application of Catalysis <i>CHM 4400 (3) Special Topics</i> (化学专业特殊课题)	2/32	2	1.78
	303353	精细化学品化学 Chemistry Fine Chemicals <i>(use overage from lab below to equal 3 credit hours)</i>	3/48	3	3 CHM 2242
	303328	聚合物合成原理 Principle of Polymer Synthesis	3/48	3	2.67
	303343	功能高分子化学 Chemistry of Functional Polymer <i>CHM 4400 (3) Special Topics</i> (化学专业特殊课题)	3/40	2.5	2.22
	303355	有机合成 Organic Synthesis <i>CHM 4493/4 (1-3) Guided Independent Study (指导下的 独立学习)</i>	3/48	3	2.67

	003316	精细化学品综合实验 Professional Experiment of Fine Chemicals	5weeks (160)	5	1 CHM L242
	小计(Total)		316	21	15.56
第 二 学 期 Semester II	003321	毕业实习 Graduation Practice	3weeks (96)	3	
		毕业论文(设计) Graduation Thesis (design)	13weeks (416)	13	
	小计(Total)		512	16	

四、课程描述

IV. Courses Description

第一学年：Year 1 (At Lanzhou University of Technology)

序号 No.	课程代码 Course Code	课程名称 Course Name	课程描述 Course Description
1	112403	思想道德修养与法律基础 Ideological&Moral Cultivation and Basics of Law	Credit: 3 Hours per week: 3 This course is helping the students to foster a correct world outlook and correct views on life and values, offering answers to various kinds of problems concerning morals and ethics raised by college students at the turning-point of their life, improving students' ability of identifying and rejecting faulty trends of thought, dealing with setbacks and adapting to a new environment, cultivating their moral integrity and norms of conducts, and enhancing their skills in coping with various conflicts and problems occurring from studies, daily life, job-choosing and friends-making, etc. This course focuses on the expatiation upon general principles of law as well as the socialist laws, introducing to the basic knowledge concerning Chinese constitution, administrative law, civil law, etc, in order for students to have an general understanding of the Marxist law and the socialist legal system with Chinese characteristics, to grasp the essence of Chinese constitution and general law, to acquaint themselves with some knowledge about civil obligations and rights, and to further accommodate themselves to the legal society.该课程是帮助学生培养正确的世界观,生活和价值观,为处于人生转折点的大学学生提供各种各样有关道德规范的问题,提高学生分辨和抵制错误的思

			想倾向，应对挫折和适应新环境，培养他们完整的道德行为规范，提高他们处理在学习、生活、职业选择和交朋友过程中处理各种冲突和问题的能力等。该课程集中详述了基本法律原理和社会主义法律，介绍有关中国宪法，行政法，民法等法律的基本知识，以便让学生对马克思注意法律和具有中国特色的社会主义法制体系有一个总体的了解，掌握中国宪法和一般法律的实质，熟悉一些公民权利义务的知识，让自己能够更好地适应法制社会。
2	111101	英语综合（一） Comprehensive English (1)	Credit: 5 Hours per week: 5 This course is designed for non-English majors. Its contents include intensive reading, extensive reading, grammar, listening, writing, etc. With the help of this course, college students are expected to arrive at CET-1 in terms of English proficiency level. 该课程为非英语专业设计，内容包括精读、泛读、语法、听力、写作等。在该课程的帮助下，就英语熟练程度而言学生预期应达到大学英语一级的程度。
3	109107-8	高等数学 B1-B2 Advanced Mathematics B1-B2	Credit: 12.5 Hours per week: 5.5 Function and limit, one-variable calculus and its application, ABC of progression and multiple-variable calculus, determinant, matrix and its calculation, system of linear equations and quadratic form, probability of occurrence, chance variable, law of large numbers and central limit theorem, sample and parametric estimation, variance analysis, regression analysis. 函数和极限，一元微积分和它的应用，ABC 级数和多元微积分，行列式和矩阵的应用，线性方程和二次方程式，事件的概率，偶然性变量，大数定律和中心极限定理，样本和参数估计，方差分析，回归分析。
4	203115	无机及分析化学(1) Inorganic and Analytical Chemistry (1)	Credit: 4 Hours per week: 4 The contents of this course are divided into three parts. The first part includes the chemical principles. Beginning with the basic theories of the modern chemistry, it expounds every basic theory of inorganic and analytical chemistry. The second part is element chemistry. It recounts the character, the law of the reactions, preparation and some important applications on elements and their compounds. It also pays much attention to the application of inorganic chemistry principle. The third part is the methods of chemical analysis. It recounts the important methods of titration, separation, spectrometry,

			<p>error analysis and data processing. In order to improve their intelligence and capabilities in application, all of the three parts emphasize combining the producing and scientific research.本课程的内容分三大大部分：第一部分为化学原理，它以近代化学学科基础理论为起点，阐述无机与分析化学的各项基本原理；第二部分为元素化学，叙述元素和化合物的基本性质，反应规律，制备和重要应用，同时充分注意无机化学原理在其中的应用；第三部分为化学分析方法，叙述重要的滴定方法，分离方法，光度分析法，误差与数据处理。三大部分均重视联系生产和科研实际，以期学生在学以致用方面得到智能锻炼。</p>
5	203414	<p>无机及分析化学实验 (1)The Experiment of Inorganic and Analytical Chemistry (1)</p>	<p>Credit: 1.5 Hours per week: 1.5 This course contains many experiments, such as the basic operation training of inorganic and analytical chemistry, the preparation of inorganic compounds, the measurement of characteristic constants of inorganic reactions, the quantitative analysis of compounds and so on.本课程内容包括无机与分析化学基本操作训练，无机化合物的制备，无机化合物反应特征的测定，化合物的定量分析等实验。</p>
6	105303	<p>计算机导论 Basics of Computer Application</p>	<p>Credit: 3.5 Hours per week: 3.5 This course is for non computer majors. It consists of two parts: theories and practical application. The former one which introduces basic concepts, principles and techniques of computer to students is compulsory and taught by teachers. The latter one which is about the manipulation of computer, is optional but must be included in the final test.该课程为非计算机专业开设。包括两部分：理论和实际应用。第一部分介绍计算机的基本概念，原理和技巧，由老师授课必修。第二部分关于计算机操作，属于选修但其摸考试包括这部分。</p>
7	113101	<p>体育（一）（二） PE (1)(2)</p>	<p>Credit: 1 Hours per week: 1 This course is compulsory for all the students. Freshmen are evaluated according to their performance on General PE or an integration of Option PE, PE theories, health standard and PE clubs. It provides a more detailed knowledge and skills of a specific sport. It introduces the principles and methods of exercise. The purpose is to help the students to exercise in a scientific way.该课程对所有学生来说必修。一年级学生的成绩评估基于他们在普通体育课或综合选择性体育课的表现，包括体育理论，健康标准和体育俱乐部。提供的知识和技能更为详细。它</p>

13	112118	毛泽东思想、邓小平理论和三个代表重要思想概论 The philosophical thinkings of Mao Zedong, Deng's Theory and the Important Thought of "THREE On-Behalf-Of"	Credit: 3.5 Hours per week: 3.5 本课程主要介绍有关毛泽东思想、邓小平理论和三个代表重要思想，培养学生科学的世界观和人生观。 The course is designed to introduce relevant theories of Mao Zedong, Deng's Theory and the Important Thought of "THREE On-Behalf-Of", to train the students a scientific world view and outlook on life.
----	--------	--	---

第二学年：Year 2 (At Troy University)

序号 No.	课程代码 Course Code	课程名称 Course Name	课程描述 Course Description
1	化学 3342 CHM 3342	有机化学 I Organic Chemistry I	Credit: 3 Hours per week: 3 The chemistry of alkanes, alkenes, polymers, alkyl halides, and alcohols, including their structures, nomenclature, reactions, reaction mechanisms, stereochemistry, and synthesis. 烷烃, 烯烃, 聚合物, 醇等有机化合物的结构, 命名, 反应及机理, 立体化学和合成.
2	化学 L342 CHM L342	有机化学 I 实验课 Organic Chemistry I Lab	Credit: 1 Hours per week: 3 Introduction to basic organic laboratory practices, including determination of physical properties, separation and purification techniques, and synthesis. 基础有机化学实验技术, 包括物理性质测定, 分离, 提纯和合成技术.
3	化学 3343 CHM 3343	有机化学 II Organic Chemistry II	Credit: 3 Hours per week: 3 A continuation of CHM 3342. The chemistry of benzene thermodynamics and electrophilic aromatic substitution, spectroscopy, alcohols, phenols and thiols, ethers, aldehydes and ketones, carboxylic acids and their derivatives, carbonyl α -substitution reactions, and amines. 苯的热力学, 亲电取代, 光谱学, 苯酚, 醚, 醛, 酮, 羧酸及其衍生物, 羰基反应和胺的有机化学
4	化学 L343 CHM L343	有机化学 II 实验课 Organic Chemistry II Lab	Credit: 1 Hours per week: 3 A continuation of CHM L342. Illustration of organic reactions, mechanisms of transformations, spectroscopy, and synthetic chemistry. 有机反应, 机理变化, 光谱特征及合成化学
5	物理 2252	General Physics I	Credit: 3 Hours per week: 3 An introduction to the laws of mechanics and

	PHY 2252	普通物理 I	thermodynamics.Co-requisite: PHY L252. 介绍力学、热力学原理。
6	物理 L252 PHY L252	General Physics I Lab 普通物理 I 实验课	Credit: 1 Hours per week: 2 Laboratory work emphasizes basic principles of mechanics and thermodynamics, the use of measuring instruments, and the interpretation of data.Co-requisite: PHY 2252. 着重对课程内容的基本原理如力学,热力学作实验验证,使用测量仪器,以及解释实验数据。
7	物理 2253 PHY 2253	General Physics II 普通物理 II	Credit: 3 Hours per week: 3 An introduction to the laws of optics, electricity and magnetism. 光学、电学和磁学入门
8	物理 L253 PHY L253	General Physics II Lab 普通物理 II 实验课	Credit: 1 Hours per week: 2 Laboratory work emphasizes basic principles of electricity, magnetism and optics, the use of measuring instruments, and the interpretation of data. 侧重光学、电学和磁学基本原理实验,及测量仪器的运用和数据的解译。
9	物理 2262 PHY 2262	微积分物理 I Physics I with Calculus	Credit: 3 Hours per week: 3 Principles and laws of mechanics and thermodynamics, utilizing the methods of calculus. 利用微积分法的力学和热力学的原理和规律。
10	物理 L262 PHY L262	微积分物理实验 I Physics I with Calculus Laboratory	Credit: 1 Hours per week: 2 Laboratory work emphasizes basic principles of thermodynamics and mechanics, the use of measuring instruments, and the interpretation of data. 侧重力学和热力学基本原理实验,及测量仪器的运用和数据的解译。
11	物理 2263 PHY 2263	微积分物理 II Physics II with Calculus	Credit: 3 Hours per week: 3 Principles of electricity, magnetism and optics, utilizing the methods of calculus. 利用微积分法的电学、磁学和光学原理和规律。
12	物理 L263 PHY L263	微积分物理实验 II Physics II with Calculus Laboratory	Credit: 1 Hours per week: 2 Laboratory work emphasizes basic principles of electricity, magnetism and optics, the use of measuring instruments, and the interpretation of data. 侧重电学、磁学和光学的基本原理实验,及测量仪器的运用和数据的解译。
13	生物 1100 BIO 1100	Principles of Biology 生物学原理	Credit: 3 Hours per week: 3 Biological principles including chemistry of life, cell structure and function, bioenergetics, cell reproduction, heredity, and ecology. 生物学原理学习。包括生命化学、细胞结构和功能、生物能、细胞再生、遗传和生态学的学习。

			介绍物理化学实验中使用的技术和方法,包括热量测定、平衡、反应动力学实验和输运性质实验。
3	化学 3352 CHM 3352	Biochemistry 生物化学	Credit: 3 Hours per week: 3 Describes the molecular basis of life. Describes the structure and function of proteins, carbohydrates, lipids and nucleic acids; describes metabolism, including glycolysis, the citric acid cycle, and oxidative phosphorylation. 学习蛋白质、核酸、脂肪酸、碳水化合物的物理特性和化学特性,重点学习化学结构和生物功能之间的关系。
4	化学 L352 CHM L352	Biochemistry Lab 生物化学实验	Credit: 1 Hours per week: 3 Laboratory experiments illustrating biochemical techniques and equipment used in isolation and characterization of macromolecules. 实验课重点在于分离和描述大分子的生化技术上。
	<u>CHM 2242</u>	<u>Analytical Chemistry</u>	<u>Credit: 3 Hours per week: 3</u> <u>The theoretical principles of quantitative wet-chemical methods for determining composition and concentration with rigorous treatment of solution equilibria. Includes an introduction to statistics.</u> <u>203115-203116 无机及分析化学(1)-(2)</u> <u>Inorganic and Analytical Chemistry (1)-(2)</u>
	<u>CHM L242</u>	<u>Analytical Chemistry Lab</u>	<u>Credit: 1 Hours per week: 3</u> <u>The practice of modern quantitative wet-chemical techniques in analytical chemistry.</u> <u>203414-203415 无机及分析化学实验(1)-(2)</u> <u>The Experiment of Inorganic and Analytical Chemistry(1)-(2)</u>
5	化学 3382 CHM 3382	Physical Chemistry II 物理化学 II	Credit: 3 Hours per week: 3 An introduction to quantum chemistry, including spectroscopy, atomic and molecular structure, molecular orbital theory, and photochemistry. CHM3381 课程内容的延续,介绍表面现象、量子化学和光谱学。重点是表面的性质、分子结构和原子结构、分子轨道理论和光化学。
6	化学 4444 CHM 4444	Advanced Inorganic Chemistry 高级无机化学	Credit: 3 Hours per week: 3 Spectroscopy of inorganic molecules, detailed molecular orbital applications, descriptive chemistry of the transition elements, including organometallic and bioinorganic compounds. 学习无机化合物的结构光谱学,分子轨道应用,过渡元素化学,有机金属化合物和生物无机化合物的知识。
7	化学 L444 CHM L444	Advanced Inorganic Chemistry Lab 高级无机化学实验课	Credit: 1 Hours per week: 3 Preparation and characterization of inorganic compounds. Experience will be provided in techniques such as using a tube furnace and handling air-sensitive compounds with a glove bag and Schlenk line. 学习无机化合物的制备和特性。实验过程中会学习一些技术,如使用管式炉的技术、用手套包和真空系统处理空气和

General Studies Requirements for Chemistry Majors

- ENG 1101 (3) Composition and Modern English I, or placement in ENG 1103
 ENG 1102 (3) Composition and Modern English II, or placement in ENG 1104
 BIO 1100 (3) Principles of Biology
 BIO L100 (1) Principles of Biology Lab
 IS 2241 (2) IS 2241 (3) Computer Concepts and Applications
 TROY 1101 (1) University Orientation
 SPH 2241 (3) Fundamentals of Speech, or placement in SPH 2243 Honors Fundamentals of Speech
- Six credit hours of international courses (designated with an asterisk) must be selected.

Select **two courses** from the following:

- ART 1133* (2) Visual Arts, or placement in ART 1134* Honors Visual Arts
 DRA 2200 (2) Introduction to Drama
 MUS 1131* (2) Music Appreciation, or placement in MUS 1132* Honors Music Appreciation

Select a **two-course sequence** in either ENG or HIS, and **one additional course** in the other area (HIS or ENG):

- ENG 2205* (3) World Literature before 1660, or placement in ENG 2207* Honors World Literature before 1660
 ENG 2206* (3) World Literature after 1660, or placement in ENG 2208* Honors World Literature after 1660
 OR
 ENG 2211 (3) American Literature I
 ENG 2212 (3) American Literature II
 OR
 ENG 2244 (3) British Literature I
 ENG 2245 (3) British Literature II
 OR
 HIS 1101 (3) Western Civilization I, or placement in HIS 1103 Honors Western Civilization I
 HIS 1102 (3) Western Civilization II, or placement in HIS 1104 Honors Western Civilization II
 OR
 HIS 1111 (3) U.S. to 1877, or placement in HIS 1113 Honors U.S. to 1877
 HIS 1112 (3) U.S. since 1877, or placement in HIS 1114 Honors U.S. since 1877
 OR
 HIS 1122* (3) World History to 1500
 HIS 1123* (3) World History from 1500

If a **two-course sequence** (above) is taken in history, select **one additional course** from the following:

- CLA 2260* (3) Classical Mythology
 Any ENG course listed in the previous (“two-course sequence”) section
 FRN 1101* (3) Introductory French I, or placement in FRN 1102*, 2201*, 2202*
 GER 1121* (3) Introductory German I, or placement in GER 1122*, 2221* or 2222*
 GRK 1111* (3) Introductory Greek I, or placement in GRK 1112*
 SPN 1141* (3) Introductory Spanish I, or placement in SPN 1142*, 2241*, 2242*
 LAT 1131* (3) Introductory Latin I, or placement in LAT 1132*, 2231*, 2232*
 PHI 2203 (3) Introduction to Philosophy
 PHI 2204 (3) Ethics and the Modern World

REL 2280* (3) World Religions

If a two-course sequence (above) is taken in history, select **two additional course** from the following; otherwise, select **three additional courses** from the following:

ANT 2200* (3) Anthropology

ECO 2251* (3) Principles of Macroeconomics

ECO 2252* (3) Principles of Microeconomics

GEO 2210* (3) World Regional Geography

Any HIS courses listed in the above “two-course sequence” section

POL 2200* (3) World Politics

POL 2241 (3) American National Government, or placement in POL 1114 Honors American National Govt.

PSY 2200 (3) General Psychology, or placement in PSY 2201 Honors General Psychology

PSY 2210 (3) Developmental Psychology

SOC 2275 (3) Introduction to Sociology

The total number of hours need to graduate with a bachelor’s degree is 120, so some elective courses will need to be taken.

五、制定中美大学共同教学计划负责人：

- 中方大学：冯辉霞博士（兰州理工大学应用化学系主任、教授）
- 美方大学：克利斯朵夫·金 博士（特洛伊大学化学系主任、教授）

V.The academic plan of Chemistry B.S. was made by:

- Chinese Partner University：Dr. Huixia Feng Ph.D. (Dean of the Dept. of Applied Chemistry from College of Petrochemical Technology, Lanzhou University of Technology, Professor)
- American Partner University：Dr. Christopher King Ph.D. (Chair of the chemistry department at Troy University, Professor)

冯辉霞 博士简历：

教育背景：

1983年09月到1987年06月获得兰州大学无机化学专业学士学位

1996年09月到1999年09月获得西北师范大学有机化学理学硕士学位

2003年09月到2006年12月获得兰州理工大学材料加工成型专业工学博士学位

职业生涯：

1987年07月到1995年03月 在青海教育学院任教无机化学、有机化学等相关课程

1995年04月至今在兰州理工大学石油化工学院任教化学专业等相关课程

2005年11月到2006年04月日本秋田县立大学学习

2004年03月至今任兰州理工大学石油化工学院应用化学系系主任

EDUCATION and PROFESSIONAL EXPERIENCE

09/1983-06/1987: Bachelor of Study at Department of Chemistry of Lanzhou University (Lanzhou).

07/1987-03/1995: The Assistant of Department of Chemistry, Qinghai Normal University, teaching Inorganic Chemistry and Organic Chemistry etc.

04/1995- present : Teaching courses related to Chemistry, Lanzhou University of Technology, (Lanzhou).

09/1996-09/1999: Master of Study at Department of Chemistry, Northwest Normal University, (Lanzhou).

09/2003- 12/2006 :Doctor of Study at College of Material Processing Engineering, Lanzhou University of Technology, (Lanzhou).

11/2005-04/2006: Study at Department of Machine Intelligence and Systems Engineering, Faculty of Science and Technology, Akita Prefectural University,(Honjyo, Akita, Japan)

03/2004- present : Dean of the Dept. of Applied Chemistry , Lanzhou University of Technology,
(Lanzhou).

Phone: (0931) 2756296,13008783050,work ; (0931) 2975375, home

Email:fenghx@lut.cn

克利斯朵夫·金 博士简历 :

教育背景 :

1987- 图雷恩大学无机化学博士

1974.6 爱荷华州考学院社会学学士

职业生涯 :

2000- 特洛伊大学化学系主任

1999-2005 特洛伊大学化学系助理教授

2005- 特洛伊大学化学系副教授

1995-1999 美国西北太平洋国立实验室高级研究员

1994-1995 东俄勒冈大学化学助理教授

1992-1994 西维吉尼亚州立大学化学助理教授

1991 秋 闰哲初级学院化学副教授

1990-1991 塔勒顿州立大学化学助理教授

Phone: (334) 670-3576 work / (334) 897-8065 home

Email: cking@trot.edu

EDUCATION and PROFESSIONAL EXPERIENCE

2000-... **Chair of the chemistry department at Troy University.**

1999-2005 **Assistant professor of chemistry at Troy University.**

2005-... **Associate professor of chemistry at Troy University.**

1995-1999 **Senior Research Scientist at Pacific Northwest National Laboratory.** Characterize flammable gas production from nuclear waste. Characterize surface reactions on a hydrogen "getter". Developed a Raman method for characterizing tank contents.

1994-1995 **Assistant professor of chemistry at Eastern Oregon University.** A one-year sabbatical leave replacement position. Courses taught: introductory chemistry, consisting of a term each of general, organic, and biochemistry. Some of the *Chemistry in Context* material was used. Also taught advanced inorganic chemistry in the spring, and lab and recitation accompanying college chemistry.

Jan., 1992-1994 **Assistant professor of chemistry at West Virginia State College, Institute, WV.** Program director of two-year Chemical Technology program. Courses taught: first semester introductory chemistry, consumer chemistry, instrumental methods of analysis, inorganic chemistry, and the accompanying labs. Had four students work on inorganic

- synthesis research projects.
- Fall, 1991 **Adjunct professor of chemistry at Ranger Junior College.** Taught college chemistry lecture and lab at this one-person chemistry department.
- 1990-1991 **Assistant professor of chemistry at Tarleton State University,** Stephenville, TX. A one-year sabbatical leave replacement position. Courses taught: first semester college chemistry, analytical chemistry, instrumental methods of analysis, and the accompanying labs.
- 1987-1990 **Senior Postdoctoral Associate with Dr. John P. Fackler, Jr., Texas A&M University.** Luminescence of Au(I)-containing binuclear and mononuclear complexes; Fenske-Hall and X α molecular orbital calculations; addition of SO₂ as a Lewis acid to bi- and trimetallic compounds; single-crystal X-ray diffraction. Advised other members of the Fackler group on their research, and was responsible for our computer and diffractometer software and hardware. Supervised the research projects of two freshmen and a senior at Texas A&M.
- 1987 **Ph.D., Inorganic Chemistry, Tulane University.** Syntheses of bimetallic complexes of Pt and Pd bridged with methylene bisphosphinic acid, CH₂[PH(O)OH]₂, H₂pcp; multinuclear NMR and analysis of complex spin systems; lifetime and emission properties of bimetallic complexes; dealkylation of phosphite ligands coordinated to platinum.
- 1981-1987 Entered Washington State University graduate school. Moved with **graduate advisor Dr. Max Roundhill** to Tulane University, New Orleans. Teaching assistant at Tulane and Washington State Universities for freshman, honors freshman, organic, and physical chemistry labs; also taught freshman chemistry recitation classes.
- 1980-1981 Independent study of Calculus and Physics in preparation for Graduate School.
- 1977-1980 **Lab Technician with Core Laboratories,** Albuquerque, NM, and Casper, WY. Water analysis, mainly by atomic absorption; uranium assay of ore samples; oil core collection and analysis.
- 1974-1977 Additional Chemistry courses, **Coe College.**
- June, 1974 **B.A. in Sociology, Coe College, Cedar Rapids, Iowa.**