# 课程大纲
# COURSE SYLLABUS

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| **1.** | **课程代码/名称**<br>**Course Code/Title** | CHE5005/高等分析化学 |
| **2.** | **课程性质**<br>**Compulsory/Elective** | 专业课 |
| **3.** | **课程学分/学时**<br>**Course Credit/Hours** | 3.00/48 |
| **4.** | **授课语言**<br>**Teaching Language** | 中文 |
| **5.** | **授课教师**<br>**Instructor(s)** | 田瑞军 |
| **6.** | **先修要求**<br>**Pre-requisites** | GE1102/GE1203 Calculus I & II, Principles of Chemical Science |

**7. 教学目标**
**Course Objectives**

本课程包括经典的定量分析及仪器分析两部分内容，由样品的前处理，分析化学的基础知识及基本操作、化学分析法、电化学分析法、质谱、色谱分析法、光学光谱法等部分构成。通过本课程的学习要求学生系统地掌握分析化学的基本原理和方法，加深对其它化学课程内容的理解，并具备应用分析化学的基本原理对实际样品进行定性和定量分析，以及解决实际分析问题的能力。
This course including classical quantitative analysis and instrumental analysis consists of sample preparation, chemical analysis, electrochemical methods, chromatography methods, spectrochemical methods, mass spectrometry, etc. This course is intended to provide students with an understanding of basic principles and theories of analytical chemistry that are necessary for chemistry, biology, materials, medical, and engineering students.

**8. 教学方法**
**Teaching Methods**

该课程将帮助学生提高对分析化学相关样品前处理和各种分离、检测方法的了解和认识，并对相关的定性和定量分析有深入地理解。
The course will help students develop the ability to handle basic problems involving sample preparation and analysis (including qualitative and quantitative analysis).

**9. 教学内容**
**Course Contents**

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| **Section 1** | Basic Tools and Operations of Analytical Chemistry |
| **Section 2** | Statistics and Data Handling in Analytical Chemistry |
| **Section 3** | Chromatography: Principles and Theory |
| **Section 4** | Gas Chromatography |
| **Section 5** | Liquid Chromatography and Electrophoresis |
| **Section 6** | Sample Preparation: Solvent and Solid-Phase Extraction |
| **Section 7** | Spectrochemical Methods |
| **Section 8** | Atomic Spectrometric Methods |
| **Section 9** | Mass Spectrometry |
| **Section 10** | Acid-Base Equilibria |

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| | **Section 11** | Acid-Base Titrations |
| | **Section 12** | Complexometric Reactions and Titrations |
| | **Section 13** | Gravimetric Analysis and Precipitation Equilibria |
| | **Section 14** | Precipitation Reactions and Titrations |
| | **Section 15** | Electrochemical Cells and Electrode Potentials |
| | **Section 16** | Potentiometric Electrodes and Potentiometry |
| | **Section 17** | Redox and Potentiometric Titrations |
| | **Section 18** | Voltammetry and Electrochemical Sensors |
| **10.** | **课程考核**<br>**Course Assessment** | |
| | ①考试；②50% presentation and teaching.20% quiz，30% exam。 | |
| **11.** | **教材及其它参考资料**<br>**Textbook and Supplementary Readings** | |
| | Required: Christian, Gary D., author. Analytical chemistry. -- Seventh edition / Gary D. Christian, University of Washington, Purnendu K. (Sandy) | |