

课程教学大纲

Course Syllabus

课程基本信息 (Course Information)					
课程代码 (Course Code)	FS344	*学时 (Class Hours)	48	*学分 (Credits)	1.5
*课程名称 (Course Name)	(中文) 食品分析实验 (English) Food Analysis Experiments				
课程性质 (Course Type)	本课程是针对食品科学与工程专业的本科生必修的实践教育课程。 This course is a compulsory course designed for undergraduates majoring in food science and technology				
授课对象 (Target Audience)	食品科学与工程专业本科生 Undergraduates Majoring in Food Science and Technology				
授课语言 (Language of Instruction)	双语 (中/英) Bilingualism (Chinese/English)				
*开课院系 (School)	农业与生物学院 School of Agriculture and Biology				
先修课程 (Prerequisite)	分析化学、有机化学、食品化学 Analytical Chemistry, Organic Chemistry, Food Chemistry				
授课教师 (Instructor)	吴时敏 Shimin Wu	课程网址 (Course Webpage)			
*课程简介 (Description)	<p>课程性质: 本课程是针对食品科学与工程专业的本科生必修的实践教育课程。</p> <p>教学内容: 掌握包括样品制备与保存、相对密度、水分含量及水分活度、总糖、蛋白质、粗脂肪、灰分、维生素、亚硝酸盐、酸度和有效酸度等食品基本理化指标实验分析方法, 使用和了解折光法、旋光法、气相、高效液相及 ICP-MS 等仪器对食品样品的分析, 同时, 进行一次食品分析综合实验。</p> <p>教学目标: 着重训练食品分析与检验技能, 以当前质量监督检验部门、食品研究实验室、技术监督局、进出口检验检疫局、公司研发机构与检验中心等要求的基本实验技能为主, 即完成十大基本分析、三大认知分析、六个物理检验、一个预处理实验、一个综合分析, 以达到培养学生熟悉食品分析与检验的思维方式、基本手段与研究方法之目的。</p> <p>This course is compulsory for undergraduates majoring in food science and technology. It is an experimental course covering basic food analysis training. Sample preparation and storage, determination of water, water activity, carbohydrates, proteins, fats and oils, vitamin, minerals, color, acid, density and additives will be performed and discussed. Modern instrumental analysis including GC, HPLC, ICP-MS, and comprehensive analysis for food samples will be performed as well.</p> <p>After completion of the course, students are expected to have learned various food analytical methods and skills for basic physicochemical properties.</p>				

课程教学大纲 (Course Syllabus)						
* 学习目标 (Learning Outcomes)	<p>1. 掌握食品分析的基础知识与实验技能，培养学生的定量分析和逻辑思维能力 (A3, A4)</p> <p>2. 掌握无机、分析及有机化学实验操作、计算机在食品科学及相关学科领域的应用等基本技能；掌握科学实验(研究)的基本的方法论(A5.1.2 , A5.1.3) 。 3. 有助于掌握食品分析的知识体系，包括食品化学、食品分析、食品营养与功能、食品添加剂、食品安全学、食品工艺学、食品质量管理与法规等内容。(A5.2.1)</p> <p>4. 掌握必要的食品科学实验技能以及相关的实验数据处理和分析方法。(A5.2.2)</p> <p>5. 培养清晰思考和用语言文字准确表达的能力，发现、分析和解决问题的能力，批判性思考和创造性工作的能力，与不同类型的人合作共事的能力。(B1, B2, B3, B4)</p> <p>6. 掌握食品分析的基本实验方法与技能；具有一定设计实验和创造实验条件的能力；能够归纳、整理、分析实验结果、撰写实验报告和总结。(B10)</p> <p>1. To grasp the basic knowledge of food analysis skills, and develop the students' ability for quantitative analysis and logical thinking (A3, A4)</p> <p>2. To master operation in inorganic, analysis and organic chemistry experiments, as well as computer application in food science and related disciplines. To master the basic methodology of scientific experiment (research) (A5.1.2, A5.1.3)</p> <p>3. To help for grasp the knowledge of food analysis, including food chemistry, food analysis, food nutrition and functional food, food additives, food safety, food technology, food quality management and regulations, and so on. (A5.2.1)</p> <p>4. To grasp the necessary experiment skills in food science and relevant data analysis methods. (A5.2.2)</p> <p>5. To develop the ability of clear thinking, accurate speaking, discovery, analysis and problem solving skills, and the ability of critical thinking and creative work, and cooperation with different people. (B1, B2, B3, B4)</p> <p>6. To master the basic experimental methods and skills of food analysis, ability to design experiments and creative experiment conditions, ability of induction, sorting, analysis of experimental results, test report and summary. (B10)</p>					
* 教学内容 进度安排及要求 (Teaching Schedule & Requirements)	教学内容 Teaching contents	学时 Class hours	教学方式 Teaching ways	作业及要求 Assignments and requirements	基本要求 Basic requirements	考查方式 Examination
	食品样品的采集与保存	3	讲授及实验	实验报告	积极动手实验、观察	出勤，操作规范、报告

Food sample preparation and storage		Teaching and experiment	Experimental report	记录 Active operation, careful observation	Attendance, Experimental operation, report
食品水分和水分活度的测定 Determination of water content and water activity in foods	3	讲授及实验 Teaching and experiment	实验报告 Experimental report	积极动手实验、观察记录 Active operation, careful observation	出勤、操作规范、报告 Attendance, Experimental operation, report
各种液态食品相对密度的测定 Determination of the relative density of different liquid foods	3	讲授及实验 Teaching and experiment	实验报告 Experimental report	积极动手实验、观察记录 Active operation, careful observation	出勤、操作规范、报告 Attendance, Experimental operation, report
食品总酸度和有效酸度的测定 Determination of total acidity and effective acidity of foods	3	讲授及实验 Teaching and experiment	实验报告 Experimental report	积极动手实验、观察记录 Active operation, careful observation	出勤、操作规范、报告 Attendance, Experimental operation, report
食品中粗脂肪含量的测定 Determination of crude fat content in foods	3	讲授及实验 Teaching and experiment	实验报告 Experimental report	积极动手实验、观察记录 Active operation, careful observation	出勤、操作规范、报告 Attendance, Experimental operation, report
折光法在食品分析中的应用 Refractive method	3	讲授及实验 Teaching and	实验报告 Experimental	积极动手实验、观察记录 Active	出勤、操作规范、报告 Attendance, Experiment

*教学内容 进度安排及要求 (Class Schedule & Requirements)	application in food analysis		experiment	report	operation, careful observation	al operation, report
	食品总灰分测定 Determination of total ash content in foods	3	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful observation	出勤、操作 规范、报告 Attendance, Experiment al operation, report
	食品总糖的测定 Determination of total sugar in foods	3	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful observation	出勤、操作 规范、报告 Attendance, Experiment al operation, report
	食品中维生素 C 的测定 Determination of vitamin C in foods	3	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful observation	出勤、操作 规范、报告 Attendance, Experiment al operation, report
	肉制品中亚硝 酸盐的检测 Detection of nitrite in meat products	3	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful observation	出勤、操作 规范、报告 Attendance, Experiment al operation, report
	食品中蛋白质 的测定 Determination of protein in foods	3	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful	出勤、操作 规范、报告 Attendance, Experiment al operation, report

*教学内容 进度安排及要求 (Class Schedule & Requirements)					observation	report
	食品 and 饮料色 泽的测定 Determination of color of foods and drinks	3	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful observation s	出勤、操作 规范、报告 Attendance, Experiment al operation, report
	旋光法在食品 分析中的应用 Optical method application in food analysis	3	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful observation	出勤、操作 规范、报告 Attendance, Experiment al operation, report
	食用油品质综 合分析与检测 Comprehensive quality analysis and detection of edible oils	6	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful observation	出勤、操作 规范、报告 Attendance, Experiment al operation, report
	食品成分的精密 仪器分析实验（气相色 谱、高效液相色谱、 原子吸收光谱法） GC, HPLC and AAS for food analysis	3	讲授及实 验 Teaching and experiment	实验报告 Experimental report	积极动手 实验、观察 记录 Active operation, careful observation	出勤、操作 规范、报告 Attendance, Experiment al operation, report
*考核方式 (Grading)	最终成绩由考勤、现场实验表现、实验报告组合而成。各部分所占比例如下： 考勤：10%。主要考核按时和全时参与实验课程，以保证对实验内容的全面熟悉程度，以及对待工作的态度。迟到、早退、缺勤都会导致实践操作能力培养机会的缺失，无法用书面自学弥补，无学校签章证明的正当理由缺课三次，将不计成绩。 现场考核：40%。主要考核动手操作实践、分析解决问题、求					

	<p>实严谨、专注好学、团结协作等方面的能力。</p> <p>实验报告：50%。主要考核对实验数据与结果进行分析和讨论的能力，包括书面表达、图表规范等。</p> <p>注：中途参军、出国等不能和当届同班同学一起上完此课的学生，请持学校特许签章，或教务部门签章的学校正式文件，并结合本课程考核方式，计算成绩。若无学校正式签章文件，缺课三次以上者，不计成绩。</p> <p>Final grade is composed of attendance, experimental operation and report.</p> <p>Attendance: 10%. This is graded individually according to the attendance. The students who are absent over three times without certified reason will not be graded for the whole course.</p> <p>Experimental operation: 40%. This is graded individually according to experimental performance in the class.</p> <p>Experimental reports: 50%. This is graded individually according to the quality of experimental reports, including the languages, results, discussion, and charts.</p>
<p>* 教材或参考资料 (Textbooks & Other Materials)</p>	<p>教材： 吴时敏、徐婷编. 食品分析与检验实验. 上海交通大学自编讲义，2013年9月。</p> <p>参考书目： [1] S. Suzanne Nielsen. Food Analysis (Third edition). New York: Kluwer Academic/Plenum Publishers, 2003.</p> <p>[2] 中华人民共和国国家标准汇编（食品、卫生检验卷），北京：中国标准出版社，最新版（与本课程当年同步）。</p> <p>Teaching materials and references: [1] Shimin Wu, Ting Xu. Food Analysis and Detection Experiments. Shanghai: Shanghai Jiao Tong university, 2013.</p> <p>References: [2] S. Suzanne Nielsen. Food Analysis (Third edition). New York: Kluwer Academic/Plenum Publishers, 2003.</p> <p>[3] Compilation of the National Standards of the People's Republic of China (Food, sanitary inspection volume), Beijing: China Standard Press, the updated version.</p>
<p>其它 (More)</p>	<p>实验课前，学生应预习实验讲义、注意事项；实验毕，应整理好操作台及实验器具。</p> <p>Before the class, the students should read teaching books and experimental attentions.</p>

	After the class, students should clean the lab and sort out experimental apparatus and glasses.
备注 (Notes)	本课程只针对食品专业本科生开设，不接受其他人员或非食品专业学生。 This course is only opened for undergraduates whose major is food science and technology.

备注说明：

1. 带*内容为必填项。
2. 课程简介字数为 300-500 字；课程大纲以表述清楚教学安排为宜，字数不限。