

# 食品科学与工程 学科博士研究生培养方案

## **Ph.D Degree Program in Food Science and Engineering**

一级学科代码：083200

Discipline code: 083200

### **一、学科概况与研究方向**

#### **I. Discipline overview and research directions**

食品科学与工程学科于 1986 年获批农产品加工工程硕士点，1993 年获批全国首个农产品加工工程博士点，1998 年获批全国首批食品科学与工程博士后流动站，2003 年获一级学科博士点，学科获批江苏省“九五”到“十一五”重点学科、江苏省首批国家重点学科培育点、原机械部重点学科，2010 年获批江苏省首批一级重点学科，2014 年和 2018 年先后获第二期、第三期江苏高校优势学科建设工程项目。2015 年全国博士后流动站评估为优秀等级。2016 年全国第四轮学科评估 B+，位列全国第八（并列）。2019 软科世界大学学科排名位居一流学科第 51-75 位档。学科每年招收博士研究生约 20 人，硕士研究生约 200 人；已招收来自 35 个国家的博、硕士留学研究生和留学博士后近 200 人；目前在读研究生近 600 人。获得全国优秀博士学位论文 1 篇、全国优秀博士学位论文提名 1 篇，江苏省优秀博士学位论文 9 篇，优秀硕士学位论文 8 篇。目前本学科所支撑的农业科学进入 ESI 排名全球前 1%，同时支持工程学、材料科学、药理学与毒理学、生物学与生物化学等 5 个学科进入 ESI 排名全球前 1%。获国家技术发明二等奖 2 项，省部级以上及行业科学技术奖 30 余项。

本学科长期坚持强化工程特色、重视学科交叉、积极推进国际合作与交流的发展理念。在农产品食品无损检测技术及智能装备、食品农产品物理加工技术及智能装备、食品营养与健康、食品生物安全、食品生物工程及智能装备等领域形成鲜明的研究特色；建设有国家农产品加工技术装备研发分中心、江苏省食品物理加工重点实验室、江苏省食品智能制造工程技术研究中心等省部级科研平台；建有世界食品保藏研究中心、中英农产品无损检测联合实验室、中美鲜切产业研究院以及食品营养与安全国际联合研究中心等一批国际化科研平台。

本学科发挥工程优势，致力于我国食品学科理论的创新和我国传统装备的升级改造和智能化，提高关键技术的成熟度和转化率，促进行业的技术跨越、提高市场竞争力；同时发挥高校资源，提供决策咨询、培养卓越人才、弘扬优秀文化。

主要研究方向：

1. 农产品食品无损检测技术及智能装备
2. 食品物理加工技术与智能装备
3. 食品生物安全
4. 食品营养与健康
5. 食品生物工程与智能装备

Food Science and Engineering, Master program in Agricultural Products Processing was acquired in 1986, Ph.D. program in Agricultural Products Processing was acquired firstly in China in 1993, and postdoctoral program in Food Science and Engineering was acquired firstly

in China in 1998, The first-grade Doctoral program in Food Science and Engineering was acquired in 2003. The discipline was Jiangsu Provincial Key Discipline during the 9<sup>th</sup>-11<sup>th</sup> Five-Year Plans, and the first-batch Cultivation Point of National Key Discipline authorized by the government of Jiangsu Province. It was a key discipline of the former National Machinery Department. The discipline was granted as the first-grade provincial key discipline in Food Science and Engineering was authorized in 2010, and was granted as the Priority Academic Discipline by Jiangsu province government in 2014 and 2018, respectively. The postdoctoral program in Food Science and Engineering was awarded as excellent grade in the evaluation of the national postdoctoral research stations in 2015. The discipline was acquired the B+ grade and was in joint 8<sup>th</sup> place nationwide in the 4<sup>th</sup> round of national discipline evaluation. In 2021, the Food Science and Engineering discipline ranked among the world's top 50 disciplines of Global Ranking of Academic Subjects for the first time, ranking 27<sup>th</sup>, which was the 3rd best discipline in China. Approximately 20 doctoral candidates and 200 master degree candidates are enrolled every year. Around 200 international graduates and post-doctoral candidates have been enrolled from about 35 countries. Approximately 600 graduate students are currently studying at our faculty. The School of Food and Biological Engineering has won 1 National Excellent Doctoral Dissertation, 1 National Excellent Doctoral Dissertation nomination, 9 Jiangsu Province Excellent Doctoral Dissertations and 8 Jiangsu Province Excellent Master's Dissertations. Currently, the Agricultural Science supported by our discipline is ranked in the top 1% of the world's ESI, with five other disciplines (Engineering, Materials Science, Pharmacology and Toxicology, Biology and Biochemistry) that are also ranked in the top 1% of the world's ESI. In the recent years, our discipline has won 2 second-class awards for National Science and Technological Advancement, and over 30 prizes of provincial and ministerial science and technology progress.

Our discipline adheres to the developmental concept of strengthening engineering foundation, attaching importance to the intersection of disciplines and actively promoting international cooperation and inter-relationships for a long period of time. It has been created a unique name in the areas of Nondestructive Detection of Food Quality and Intelligent Equipment, Food Physical Processing and Intelligent Equipment, Food Biological Safety, Food Nutrition and Health, Food Bioengineering and Intelligent Equipment, etc. Our faculty have government funded research institutions, including: National R&D Center for Agro-processing Equipment; Jiangsu Provincial Key Laboratory for Physical Processing of Agricultural Products; Jiangsu Provincial Research Center for Food Intelligent Manufacturing Engineering Technology, etc. And our internationalized research platforms are as follows: World Food Preservation Research Center, UK-China joint Laboratory for Non-destructive detection of Agricultural products, China-US Fresh-cut Industry Research Institute, and International Joint Research Centre for Food Nutrition and Safety.

The discipline plays full attention to its engineering advantages, devotes itself to the continuous innovation of China's food discipline theory, and the upgrading intellectualization of traditional equipment, improving the maturity and conversion rate of key technologies, promoting the technological leapfrogging of the industry, and increasing market competitiveness. Meanwhile, the discipline aims of placing our utmost priority to the resources of the school and university, providing decision making consultation, training outstanding talents, and promoting excellent cultures.

Main research fields:

1. Nondestructive Detection of Food Quality and Intelligent Equipment;

2. Food Physical Processing and Intelligent Equipment;
3. Food Biological Safety;
4. Food Nutrition and Health;
5. Food Bioengineering and Intelligent Equipment

## 二、培养目标

### II. Training objectives

为适应我国国民经济发展和国家战略需求，培养德智体全面发展的高层次专门人才，对博士研究生培养基本要求如下：

1. 具有正确的人生观、价值观和世界观，品行端正，学风严谨，团结协作，具有强烈的事业心和科学献身精神。
2. 掌握本学科坚实宽广的基础理论和系统深入的专门知识，具有独立从事科学研究工作的能力，在科学或专门技术上做出创造性成果。至少熟练掌握一门外语，具有一定的国际视野和熟练进行国际学术交流的能力。
3. 身心健康。

In order to meet the needs of national economic development and strategy, and to train strong professionals with all-round development of moral, intellectual and physical level, the basic requirements for the training of doctoral students are as follows:

1. Healthy perspectives on life and values, good moral character, excellent study habit, strong sense of enterprise and a pioneering spirit.
2. With firm foundation of the basic theory of food science and engineering, professional knowledge and experimental skills, professional development and frontiers; with an ability to independently carry out scientific research, and making creative achievements in science or related technologies. Mastering at least one foreign language, with an international vision and proficiency in international academic exchanges.
3. With good physical and mental health.

## 三、培养方式及学习年限

### III. Training mode and the duration of study

#### 1. 培养方式：

实行导师领导下的指导小组负责制，在研究生培养的全过程中进行指导。导师（指导小组）不仅负责制订研究生培养计划，指导科学研究、专业实践和学位论文等工作，而且对研究生的思想品德、学术道德有引导、示范和监督的责任。

#### 2. 学习年限：

博士学制为 4 年，最长学习年限为 6 年。原则上不允许提前毕业。

#### 1. Training mode

The mentor group responsibility system under the guidance of a supervisor is implemented to guide the whole process of the postgraduate training. Supervisor (mentor group) is not only responsible for the formulation of graduate training programs, guiding scientific research, professional practice and dissertations and other work, but also for guiding, demonstrating and supervising the ideological and moral character and academic ethics of the postgraduate.

#### 2. The duration of study

The duration of study for a full-time doctoral candidate is generally 4 years, with a maximum of 6 years. In principle, early graduation is not allowed.

## 四、课程学分

### IV. Course credits

#### 1. 学分要求

##### 1. Credit requirements

课程总学分不低于 15 学分，其中学位课不少于 10 学分，选修课不少于 5 学分。（每学分 16 学时）

The total credits of the course shall not be less than 15 credits, including not less than 10 credits for degree courses and no less than 5 credits for elective courses. (16 credit hours per credit)

#### 2. 课程设置

##### 2. Curriculum

Course Category 课程类别		Course Name 课程名称	Credit 学分	Term 学期 (Spring/ Autumn)	School by Which Courses Opened 开课学院	Type of the Course 课程性质	Remark 备注
Degree course 学位课	Public degree course 公共 学位课	Integrated Chinese I 综合汉语 I	1	Autumn	Language & Culture Center 语言文化中心	English taught course 全英文课程	Compulsory 必修
		Integrated Chinese II 综合汉语 II	2	Autumn	Language & Culture Center 语言文化中心		
		Overview of China 中国文化概论	3	Autumn	OEC 海外教育学院		
	Basic theory course 基础 理论课	Functional analysis theory and its application 泛函分析理论及运 用	2	Autumn	School of Mathematical Sciences 数学科学学院	English taught course 全英文课程	At least 2 credits 至少 2 学分
		Theory and application of chaotic dynamics 混沌动力学理论及应 用	2	Autumn	School of Mathematical Sciences 数学科学学院	English taught course 全英文课程	
		Mathematical model and its application 数学模型及应用	2	Autumn	School of Mathematical Sciences 数学科学学院	English taught course 全英文课程	

Course Category 课程类别		Course Name 课程名称	Credit 学分	Term 学期 (Spring/ Autumn)	School by Which Courses Opened 开课学院	Type of the Course 课程性质	Remark 备注
		Mathematical model in food engineering 食品工程中的数学 建模	2	Autumn	School of Food and Biological Engineering 食品与生物 工程学院	English taught course 全英文课程	
	Core specialized degree course 核心专业 学位课	Special theme on food science and technology 食品与科学技术专 题	3	Autumn	School of Food and Biological Engineering 食品与生物 工程学院	Bilingual course 双语课程	Compulsory 必选
Non-degree course 非 学 位 课	Specialized elective course 专业 选修课	Modern food chemistry 现代食品化学	2	Spring	School of Food and Biological Engineering 食品与生物 工程学院	English taught course 全英文课程	At least 5 credits 至少 5 学分
		Modern microbiology 现代微生物学	2	Autumn	School of Food and Biological Engineering 食品与生物 工程学院	English taught course 全英文课程	
		Advances in food science and technology 食品科学技术前沿 进展	2	Autumn	School of Food and Biological Engineering 食品与生物 工程学院	English taught course Cutting-edge lecture 全英文课程 前沿讲座	
		Laboratory standard operating procedures and skills 实验室操作安全规 范及技能	2	Autumn	School of Food and Biological Engineering 食品与生物 工程学院	English taught course Experimental course 全英文课程 实验平台	

Course Category 课程类别		Course Name 课程名称	Credit 学分	Term 学期 (Spring/ Autumn)	School by Which Courses Opened 开课学院	Type of the Course 课程性质	Remark 备注
		Nondestructive detection techniques and equipments for food and agro-products 食品农产品无损检测技术与装备	2	Autumn	School of Food and Biological Engineering 食品与生物工程学院	English taught course 全英文课程	
		Modern food instrumental analysis 现代食品仪器分析	3	Spring	School of Food and Biological Engineering 食品与生物工程学院	English taught course Experimental course 全英文课程 实验平台	
		Modern food physical processing technologies and equipments 现代食品物理加工技术与装备	2	Spring	School of Food and Biological Engineering 食品与生物工程学院	English taught course 全英文课程	
		Advanced nutrition 高级营养学	3	Autumn	School of Food and Biological Engineering 食品与生物工程学院	Bilingual course 双语课程	
	Public elective course 公共选修课	All graduate programs in all disciplines throughout the school 全校所有学科的全部研究生课程					Optional 任选

Note: Please specify the type of the course {English taught course, bilingual course, cutting-edge lecture or experimental course}  
课程性质中请明确是全英文课程、双语课程、前沿讲座或实验平台课程等

## 五、拓展学分要求

### V. Extended credit requirements

建议留学研究生在学期间参加一定量的素质提升活动，参加活动可以获取拓展学分。  
如：

1. 参加国家级、省级研究生创新实践赛事活动并获三等奖及以上奖项（排名前三），获得 3 个拓展学分。

2. 参加并通过各学科规定的国家认可度高的技能型资格考试，获得 3 个拓展学分。考试科目名称由各学科确定并报研究生院备案后执行。

3. 参加各类社会公益劳动或志愿服务活动，每项活动 1-2 个拓展学分（根据活动涉及面、影响力等因素综合确定），每学期初由各学院将活动内容报研工部审核备案并确定学分，活动结束后提交待认定的学生名单。活动所获拓展学分可累计。

4. 除培养计划的要求外，另选修公共选修课或利用国内外优质慕课资源进行系统学习并且成绩合格（根据课程学分直接认定拓展学分）。

5. 本学科规定的其他利于加强研究生德育、体育、美育、劳动教育等相关的拓展学分获取途径（需提前报研究生院审核备案）。

It is recommended that international graduate students participate in a certain amount of quality improvement activities, and they can obtain extended credits by participating in the activities. For example:

1. Participated in the national and provincial postgraduate innovation practice events and won the 3<sup>rd</sup> prize and above (ranking the top three) (3 extended credits).

2. Participated in and passed the skill type qualification examinations with highly national recognition and recognized by the discipline (3 extended credits). The names of the examination subjects shall be determined by the discipline and reported to the Graduate School for record before implementation.

3. Participate in various social welfare labor or volunteer service activities (1-2 extended credits for each activity, determined according to the coverage, influence and other factors of the activity). At the beginning of each semester, the School of Food and Biological Engineering will submit the activity content to the Department of Graduate Work for review, record and determine the credits. At the end of the activity, submit the list of students to be confirmed. The extended credits obtained by the activity can be accumulated.

4. In addition to the requirements of the training plan, the graduate students can also take public elective courses or use domestic and foreign high-quality MOOC courses for systematic learning and pass the examination (the extended credits are directly recognized according to the course credits).

5. Other access to the extended credits conducive to strengthening the moral education, physical education, aesthetic education, labor education and recognized by the discipline (which shall be reported to the Graduate School for review and record in advance).

## 六、实践学分要求

### VI. Practice credit requirements

#### 1. 学术活动（2 学分）

博士研究生须参加学校组织的国内外知名专家学者专题讲座、学术报告、研究生论坛等学术研讨活动，参加学术研讨活动后必须形成完整的总结报告。博士研究生在学期间应参加 15 次以上学术报告活动。研究生在国际会议或全国性高层次学术会议上进行学术论文墙报展示或口头报告者，视同其学术活动环节合格，由学科负责考核。

#### 2. 文献阅读（2 学分）

博士研究生在开题前至少阅读 40 篇本研究领域的中外文文献。文献阅读于学位论文开题前由导师考核并记录成绩，不合格者不得进入学位论文开题环节。

#### 3. 专题研讨（1 学分/次）

博士研究生在学期间必须在学科范围内公开进行不少于 6 次的文献研读交流、学术研究进展汇报和专题研讨汇报，鼓励研究生跨学科研讨。专题研讨由导师审核认定。

#### 4. 实践环节 (1 学分)

博士研究生在校期间必须进行不少于 1 个月时间的实践环节（包括教学实践、临床实践、生产实践和社会调查等），由所在实践单位和导师共同评定。

#### 5. 综合考核 (2 学分)

研究生在进入开题前，由学科方向组织综合考核，对学生参加学术活动、文献阅读、专题研讨的情况开展综合考核，其中学术活动和专题研讨需完成全部要求的 50%、文献阅读需全部完成，方可通过考核，进入开题环节。

#### 1. Academic activities (2 credits)

During the period of study, doctoral students should attend more than 15 academic activities, such as seminars or academic reports by well-known experts and scholars at home and abroad, and forums for graduate students organized by the university. And summary reports must be submitted after participating in the academic activities.

Postgraduate students are encouraged to participate in international conferences or national high-level academic conferences during their studies. Doctoral students who present poster or give oral presentation at international conferences or national high-level academic conferences shall be regarded as qualified in academic activities (please provide relevant certification materials to the discipline).

#### 2. Literature reading (2 credits)

Doctoral students are required to read at least 40 articles from research field before proposal. The literature reading will be examined in advance by the supervisor and the results will be recorded. Those who fail to pass it will not be allowed to apply for dissertation proposal.

#### 3. Seminars (1 credit at a time)

During the period of study, the doctoral students must conduct open literature study, academic research progress reports and special topic discussion reports within the discipline at least 6 times.

#### 4. Internship and practice training (1 credit)

During the period of study, the doctoral students should attend internship or practice training for more than 1 month, including: teaching practice, production practice, and social investigation, etc., which will be assessed by both the practice organization and the supervisor.

#### 5. Comprehensive discipline assessment for doctoral students (2 credits)

The subject comprehensive assessment is taken by the discipline before the dissertation proposal, which mainly assesses the students' performances in accomplishing the required academic activities, literature reading and seminars. Only the students accomplish 50% of academic activities, 50% of seminars and the whole literature reading as required above, can they pass the assessment and then apply for dissertation proposal.

## 七、学位论文与学位授予

### VII. Dissertation and degree requirements

#### 1. 论文开题

博士研究生须完成综合考核，拟定学位论文研究题目，经导师审核同意，方可作论文开题报告。开题报告应论述学位论文选题依据、研究方案、预期目标与科研成果、工作计划等关键问题。学科成立学位论文开题专家考核小组，由本学科或相关学科至少 5 名专家组成（本学科专家不得少于一半，导师和指导小组成员必须回避），确定一名负责人主持开题考核工作。学位论文开题实行专家小组评分制度，“暂缓通过”的比例不得少于实际开题人数的 15%。暂缓通过者可于 6 个月后重新申请开题，两次开题均未通过者按退学处



理。博士研究生学位论文开题报告审核通过两年（至少 16 个月）后方可申请送审答辩。具体要求详见《江苏大学研究生学位论文选题与开题的要求及考核办法（暂行）》（江大研字（2018）09 号）。

## 2. 完成完整的科研训练并获得相应的科研成果

博士研究生在学期间必须参与完整的科研训练过程，获取一定的科研成果，具体要求详见《江苏大学关于研究生在读期间完成科研训练积分的规定》（江大校〔2021〕111 号）和《食品与生物工程学院关于研究生在读期间完成科研训练积分的补充规定》（食生〔2021〕26 号）。

## 3. 中期汇报

研究生在学位论文中期阶段应作中期汇报。学院指定负责人组织不少于 3 名正高职称的专家组成考核小组（包括主导师），举行公开报告会，由研究生对论文工作情况进行全面介绍，考核小组成员指出存在的问题，并提出改进意见。报告会需做好详细记录，考核小组针对研究生中期研究工作的情况给出评语和成绩，填写考核表，经考核小组负责人签字后交学院主管院长审核。中期汇报不通过者论文工作至少延长 3 个月，并再次组织中期汇报，直至通过。

## 4. 论文撰写

学位论文必须在导师指导下由博士研究生本人独立完成，论文格式参见《江苏大学研究生学位论文撰写格式要求》。

## 5. 论文评阅与答辩

博士研究生的课程学分、拓展学分和实践学分均满足要求后方可进入学位论文送审、答辩环节，博士生在学位论文送审前还必须通过论文预审和预答辩环节。学位论文送审、答辩等要求详见《江苏大学学位授予工作实施细则》和《江苏大学研究生学位论文“盲审”工作办法》等相关规定。

## 1. Dissertation proposal

Doctoral students must complete the comprehensive assessment and draw up the research topic of the thesis, which should be examined and approved by their supervisors before they can make a dissertation proposal. The dissertation proposal should discuss the key issues such as the basis of dissertation topic selection, study protocol, expected goals and research results, and work plan.

Experts in title selection should be established by the discipline. The advisory committee consists of at least 5 members from the discipline or related disciplines (experts from the discipline cannot be less than 50%, and the supervisor and members of the steering group must be avoided), including a major advisor, who acts as the head of the committee.

The expert panel grading system is implemented in the dissertation proposal. The proportion of "deferred approval" shall not be less than 15% of the actual number of students who apply for dissertation proposal. Those who fail to pass can apply for the examination again after 6 months. Each graduate student only has two dissertation opening opportunities during his/her studies. Those who fail to pass the examination twice will be treated as dropouts. After the dissertation proposal report has been approved for 2 years (at least 16 months), the dissertation can be submitted for examination and defense. For specific requirements, please refer to the *Requirements and Assessment Methods for Topic Selection and Opening of Postgraduate Dissertation of Jiangsu University (Provisional) (jdyz (2018) No.09)*.

## 2. Complete scientific research training and obtain corresponding scientific research achievements

During the period of study, postgraduates must participate in the process of complete scientific research training and obtain certain scientific research achievements. For specific requirements,

please refer to *The Regulations of Jiangsu University on the Need for Postgraduates to Complete Scientific Research Training and Obtain Corresponding Scientific Research Achievements (jdx (2021) No.111)* and *Supplementary Regulations on Publishing Academic Papers of Graduate Students in Jiangsu University (ss (2021) No.26)*.

### 3. Interim report

Graduate students should make an interim report in the mid-term of their dissertation. The designated person by the school shall organize at least 3 experts with senior titles to form an assessment group (including the main supervisors) to hold an open seminar, where the graduate students will give a comprehensive introduction to the work of the thesis. The members of the assessment group will point out the existing problems and put forward improvement suggestions. The seminar shall be recorded in detail. The assessment group shall give comments and scores on the mid-term research work of the graduate students, fill in the assessment forms, and submit them to the dean in charge of the school for review after being signed by the person in charge of the assessment group.

For those who fail to pass the interim report, the process shall be extended for at least 3 months, and the interim report shall be organized again until the students get passed.

### 4. Dissertation writing

The dissertation must be completed independently by the doctoral candidates under the guidance of their supervisors. For the format of the dissertation, please refer to *The Requirements for Writing Format of Graduate Dissertations in Jiangsu University*.

### 5. Dissertation review and defense

Doctoral students can carry out the process of thesis submission and defense, only after their course credits, language proficiency and practical credits all meet the requirements. Before the submission, the dissertation should be peer-reviewed and peer-defensed, which are two vital parts of the dissertation.

For the requirements of dissertation review and defense, please refer to relevant regulations such as *Implementation of Degree Conferment in Jiangsu University* and *Working Measures of "Blind Review" for Postgraduate Dissertation of Jiangsu University*.

## 八、其他要求

### VIII. Other requirements

留学研究生毕业时的语言（英语、汉语）能力要求请参照江苏大学研究生院及海外教育学院的相关规定。

For languages proficiency requirements (English and Chinese) of international graduate students before graduation, please refer to the relevant regulations of the Graduate School and Overseas Education College of Jiangsu University.

## 附、主要经典著作和专业学术期刊阅读参考目录

### Appendix: Catalogue of professional journals to be read

1. Annual Review of Nutrition
2. Annual Review of Food Science and Technology
3. Critical Reviews in Food Science and Nutrition
4. Nutrition Reviews
5. Advances in Agronomy

6. Proceedings of The Nutrition Society
7. Molecular Nutrition & Food Research
8. Trends in Food Science & Technology
9. Journal of Functional Foods
10. Journal of Nutrition
11. International Journal of Food Microbiology
12. Nutrition Research Reviews
13. Comprehensive Reviews in Food Science and Food Safety
14. Food Microbiology
15. Nutrition & Metabolism
16. Food Chemistry
17. International Journal of Food Microbiology
18. Nutrients
19. Food and Bioprocess Technology
20. Journal of Agricultural and Food Chemistry
21. Food Research International
22. Nutrition
23. Food Engineering Reviews
24. Food & Function
25. Journal of Agricultural Science
26. Food Control
27. Food Quality and Preference
28. Nutrition Journal
29. Food and Chemical Toxicology
30. Journal of Sensory Studies
31. Journal of Nutrigenetics and Nutrigenomics
32. Journal of Food Engineering
33. International Dairy Journal
34. Food Reviews International