广东以色列理工学院生物技术[1]专业人才培养方案

（专业代码：071002H）

一、概述

本专业遵循以色列理工学院生物技术与食品工程学院的设置，是世界上仅有的几个将工程技术与生命科学相结合的项目，其独特地将工程、技术与自然科学、生命科学，尤其是生物技术相结合。

二、培养目标

培养生物技术与食品工程两个领域的工程师和科技人才，毕业生能够同时胜任生物技术和食品领域的工作。毕业生可在食品、药品、化妆品、环境保护有关的标准机构或者食品、药品、农业、能源、环境等相关政府机构工作。

三、毕业学分要求

四年制本科专业的总学分为 161 分，含 2 个学分的体育课。学生还需要修满教育部规定的思想政治理论课程学分，并达到考核合格标准。教学既包含理论教学，也包括实践教学环节。

四、修业年限

四年，授予广东以色列理工学院生物技术专业理学学士学位，以色列理工学院 Biotechnology and Food Engineering 学士学位。

五、人才培养基本要求

1. 系统掌握生命科学技术的基础知识和基本理论。
2. 熟练掌握基因工程、细胞工程、蛋白质与酶工程、生化分离与分析等生物科学和技术实验的基本技能。
3. 掌握本专业所需的数学、物理学、化学、信息学等学科的基本知识，掌握一定的生物工程相关原理的基础知识。
4. 初步掌握生物技术研究的方法和手段，初步具备发现、提出、分析和解决生物技术相关问题的能力。
5. 具备良好的自学习惯和能力、较好的表达交流能力、一定的计算机及信息技术应用能力，自主学习、自我发展能力。

1.以色列理工学院对应专业名称为“Biotechnology and Food Engineering，生物技术与食品工程”。

6. 具有一定的国际视野、高水平的外语应用能力和跨文化交流与合作能力。
7. 具有优良的创新意识、批判性思维和可持续发展理念。

六、毕业要求

本专业学生在规定年限内完成教学计划要求，取得不少于规定的 161 学分（包括专业核心课程 121.5 学分，专业选修课程 29.5 学分以及通识选修课程 10 学分），并且每门课程达到 55 分以上，GPA 达 65 分以上，满足教育部规定的思想政治理论课的学分要求，可经审核准予毕业。

七、基本信息资源

通过手册、网站等形式，提供本专业的培养方案，各课程的教学大纲、教学要求、考核要求、毕业审核要求等基本教学信息。

八、教材及参考书

选用反映国际水平的外文版教材，有利于稳妥地开展双语或全英文教学。

生物技术专业课程目录 [2]

专业必修课	121.5 分
专业选修课	29.5 分
通识选修课	10 分
总分	**161 分**

课程代码	课程名称 （专业核心课程）	学分
第一学期		
104041	微积分 1M	5
124120	化学基础	5
114051	物理学 1	2.5
324033	专业英语 2	3
134058	生物学 1	3
394800	体育课	1
	总学分	**19.5**
第二学期		
064522	生物技术与食品工程导论	2
134019	生物化学与酶化学导论	2.5
104043	微积分学 2M	5
104019	线性代数 M	4.5
125801	有机化学	5
125101	分析化学 1	1.5
394800	体育课	1
	总学分	**21.5**
第三学期		
104131	常微分方程/H	2.5
114052	物理学 2	3.5
134113	生物化学代谢	3.5
064523	分子生物技术导论	2.5
064212	食品技术	2
124510	物理化学	4
	总学分	**18**
第四学期		
064115	流体力学	4
064322	食品化学	3
104228	偏微分方程 M	3
234128	科学计算导论（Python）	4
064325	食品生物化学与化学实验	2

2.开设课程与学期根据以色列理工学院教学计划与实际教学安排可能进行动态调整。

064419	基础微生物学	3
064413	微生物学实验	1.5
	总学分	**20.5**
第五学期		
064117	热传递现象	3
064507	分子生物技术	3.5
064106	生物技术与食品工程中的热力学	4
064420	食品微生物学	3
064324	食品分析	3
064326	食品生物材料分析实验	2
	总学分	**18.5**
第六学期		
094481	概率论与数理统计导论	4
064118	质量传递现象	3
064250	生物材料科学与技术	3
064120	生物技术和食品工程中的数值方法	3
	总学分	**13**
第七学期		
064615	营养学	2
064509	生物技术处理工艺	3.5
064239	生物加工与食品处理工程实验	2.5
	总学分	**8**
第八学期		
066525	生物医学创新与创业	2.5
	总学分	**2.5**

GTIIT Cultivation Scheme of Biotechnology and Food Engineering Program

1. Overview

The program is one of the few programs worldwide that combines engineering technology with life science. It uniquely combines engineering and technology with natural science, life science, and especially biotechnology.

2. Cultivation Goal

The program cultivates engineers and technical professionals in the fields of biotechnology and food engineering. Its graduates are able to work in the fields of biotechnology and food, and to seek employment in institutions related to food, medicine, cosmetics, environmental protection, or in governmental agencies of food, medicine, agriculture, energy, environment, etc.

3. Total Credits for Graduation

The total credits of the four-year undergraduate program are 161, including 2 credits of physical education courses. Students are also required to complete the credits in ideological and political theory courses as stipulated by the Ministry of Education of China (MOE) and meet the passing assessment standards. The teaching includes theoretical teaching as well as practical teaching.

4. Study Years

4 years, students will be awarded the bachelor degree in Biotechnology of GTIIT, and bachelor degree in Biotechnology and Food Engineering from the Technion.

5. Basic Requirements for Talents Cultivation

a. Systematically master the basic knowledge and the basic theories of life science and technology.
b. Skillfully master the basic skills for biotechnology and technology experiments in genetic engineering, cell engineering, protein, enzyme engineering, biochemical separation and analysis, etc.
c. Master the basic knowledge of mathematics, physics, chemistry, information science and other subjects that are required by the program; master certain basic knowledge of theories related to biotechnology engineering.
d. Have a preliminary grasp of methods and means of conducting biotechnology researches; have the preliminary ability to discover, propose, analyze and solve problems related to biotechnology.

e. Have good self-learning habits and ability, good expression and communication skills, certain computer and information technology application ability, independent learning ability and self-development ability.
f. Have a global vision, high-level foreign language proficiency, intercultural communications ability and cooperation ability.
g. Have a sense of innovation, critical thinking skills and sustainable development awareness.

6. Graduation Requirements

Students will graduate when fulfilling the graduation requirements within the prescribed number of years, and have at least 161 credits of the described structure of core (121.5 credits), program elective (29.5 credits) and general elective courses (10 credits), with a minimum grade of 55 in each course, and GPA above 65. Fulfilling the requirement of MOE ideological and political theory courses, students may be approved for graduation upon review.

7. Basic Information Resources

The program cultivation schemes, syllabi, teaching criteria, and assessment criteria of courses, graduation evaluation criteria and other basic teaching information are offered in form of brochures, websites, etc.

8. Textbooks and References

Foreign language textbooks that reflect the international level are selected for steady practices of bilingual or fully English-medium instruction.

Biotechnology and Food Engineering Program Curriculum[3]

Compulsory Courses	121.5	points
Program Elective Courses	29.5	points
General Elective Courses	10	points
TOTAL	**161**	**points**

Course Code	Course Name (Program Core Course)	Credits
Semester 1		
104041	Differential and Integral Calculus 1m	5
124120	Fundamentals of Chemistry	5
114051	Physics 1	2.5
324033	Technical English-Advanced B	3
134058	Biology 1	3
394800	Physical Education Courses	1
	Total	**19.5**
Semester 2		
104043	Differential and Integral Calculus 2m	5
104019	Linear Algebra M	4.5
125801	Organic Chemistry	5
125101	Analytical Chemistry 1 For Engineers	1.5
134019	Introduction to Biochemistry and Enzimol	2.5
064522	Intro. To Biotechnology and Food Eng.	2
394800	Physical Education Courses	1
	Total	**21.5**
Semester 3		
104131	Ordinary Differential Equations/H	2.5
114052	Physics 2	3.5
124510	Physical Chemistry	4
064523	Introduction to Molecular Biotechnology	2.5
064212	Food Technology	2
134113	Metabolic Pathways	3.5
	Total	**18**
Semester 4		
104228	Partial Differential Equations/H	3
234128	Introduction to Computing with Python	4
064322	Food Chemistry	3
064325	Lab. in Food Biochemistry and Chemistry	2

3. Course offerings and scheduling may be properly adjusted in accordance with the Technion's academic plan and actual teaching arrangements.

064115	Fluid Mechanics	4
064419	General Microbiology	3
064413	Microbiology Lab.	1.5
	Total	**20.5**
Semester 5		
064117	Heat Transfer Phenomena	3
064507	Molecular Biotechnology	3.5
064106	Thermodynamics in Biotech. and Food Eng.	4
064420	Food Microbiology	3
064324	Food Analysis	3
064326	Food Biological Material Analyses Lab	2
	Total	**18.5**
Semester 6		
094481	Int. To Probability and Statistics	4
064118	Mass Transport Phenomena	3
064250	Biomaterial Science and Technology	3
064120	Numerical Methods in Biotech and Food Eng.	3
	Total	**13**
Semester 7		
064615	Nutrition	2
064239	Bioprocess and Food Process Eng. Lab.	2.5
064509	Process Biotechnology	3.5
	Total	**8**
Semester 8		
066525	Entrepreneurship in Bio. and Food Eng.	2.5
	Total	**2.5**