

## 课程详述

### COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	课程名称 <b>Course Title</b>	生命科学概论 (INTRODUCTION TO LIFE SCIENCE)				
2.	授课院系 <b>Originating Department</b>	生物系 Department of Biology				
3.	课程编号 <b>Course Code</b>	BIO102B				
4.	课程学分 <b>Credit Value</b>	3				
5.	课程类别 <b>Course Type</b>	通识必修课程 General Education (GE) Required Courses				
6.	授课学期 <b>Semester</b>	春季 Spring / 秋季 Fall				
7.	授课语言 <b>Teaching Language</b>	英文 English / 中英双语 English & Chinese				
8.	授课教师、所属学系、联系方式 (如属团队授课, 请列明其他授课教师) <b>Instructor(s), Affiliation &amp; Contact</b> (For team teaching, please list all instructors)	生物系 Department of Biology 邓怿 DENG Yi 副教授 Associate Professor dengy@sustech.edu.cn Andrew Hutchins 副教授 Associate Professor andrewh@sustech.edu.cn 张宏民 ZHANG Hongmin 副教授 Associate Professor zhanghm@sustc.edu.cn 陈永龙 CHEN Yonglong 副教授 Associate Professor chenyl@sustc.edu.cn 余聪 YU Cong 副教授 Associate Professor yuc@sustc.edu.cn 李瑞熙 LI Ruixi 助理教授 Assistant Professor lirx@sustc.edu.cn				
9.	实验员/助教、所属学系、联系方式 <b>Tutor/TA(s), Contact</b>	待公布 To be announced				
10.	选课人数限额(可不填) <b>Maximum Enrolment (Optional)</b>					
11.	授课方式 <b>Delivery Method</b>	讲授 <b>Lectures</b>	习题/辅导/讨论 <b>Tutorials</b>	实验/实习 <b>Lab/Practical</b>	其它(请具体注明) <b>Other (Please specify)</b>	总学时 <b>Total</b>
	学时数 <b>Credit Hours</b>	40			8 (学生口头报告及复习) ( student presentation and review)	48

12. 先修课程、其它学习要求 <b>Pre-requisites or Other Academic Requirements</b>	无 N/A
13. 后续课程、其它学习规划 <b>Courses for which this course is a pre-requisite</b>	本课程为通修通识必修课，是适合非生物专业的课程。 This is a compulsory course for general study, and therefore is suitable for non-biology majors.
14. 其它要求修读本课程的学系 <b>Cross-listing Dept.</b>	

### 教学大纲及教学日历 SYLLABUS

#### 15. 教学目标 Course Objectives

生命科学概论为具有广泛兴趣的学生而设计，课程的目的不在复习高中生物，而是在大学比较开放自由的学习气氛下引领同学一窥生命科学的奥妙。其介绍的内容包括对科学概念的理解所需的一般背景知识，以及了解生命科学对个人和社会的影响。在详细介绍这些概念所含基本原则的基础上，启迪学生对自然现象的好奇与探索，并实现以下目标：

- 1、主动而独立地学习科学，培养和发展科学思维
- 2、欣赏科学，意识到科学与科技进步对社会的影响，提高科学素养

Introduction to Life Science is designed for students with broad interests who desire maximum freedom to pursue their particular educational goals.

Informational content (Listed below) provides the background knowledge required for a general understanding of scientific concepts, and the perspective for understanding the impact of biological sciences on society. It should still present the underlying principles behind these concepts in enough detail to ensure that students have the background knowledge necessary to achieve following objectives:

1. to introduce students to the process of scientific thinking
2. to help students gain an appreciation for how science is conducted

#### 16. 预达学习成果 Learning Outcomes

学生将能够：

- 1、询问科学问题
- 2、认识到数学、物理、化学和地理学在生命科学研究中的重要性
- 3、了解科学和技术对全球社会的影响
- 4、讨论并确定新技术引发的道德问题
- 5、展示生命科学在一下领域的应用：

- 1) 个人问题
- 2) 社会
- 3) 经济学
- 4) 技术
- 5) 道德问题

Students will be able to:

1. Ask scientific questions of their world
2. Recognize the integration of mathematics, physics, chemistry, and geology into the study of biology

3. Understand the impact of science and technology on the global society
4. Discuss and identify ethical issues that new technology raises
5. Demonstrate the application of biological concepts to:
  - 1) Personal issues
  - 2) Society
  - 3) Economics
  - 4) Technology
  - 5) Ethical issues

17. 课程内容及教学日历（如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）

**Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)**

Informational Content

Introduction: Biology Today (2 hrs)

Concept #1. Life's Common Plan (10 hrs)

1.1 Structural organization of cells (4 hrs)

1.1.1 The Chemical Basis of Life (2 hrs)

1.1.2 Structural Organization of Cells (2 hrs)

1.2 Basic cellular processes essential for sustaining life (4 hrs)

1.2.1 Making life work (2 hrs)

1.2.2 Photosynthesis: Using Sunlight to Make Food (2 hrs)

1.3 Cell form and function and cell communication (2 hrs)

Concept #2. Adaptations of Life's Common Plan (2 hrs)

2.1 Introduction to evolution as an ongoing process (2 hrs)

Concept #3. Continuation of Life (Genes, Chromosomes and DNA) (8 hrs)

3.1 Information molecules: Genes to proteins (2 hrs)

3.2 Cellular basis of inheritance: Cell division and Meiosis (2 hrs)

3.3 Simple and complex Inheritance (2 hrs)

3.4 Biotechnology for practical purposes (2 hrs)

Concept #4. Human Biology and Human Health (12 hrs)

4.1 The digestive system topics (2 hrs):

Basic anatomy of the digestive system, physiology of the digestive system, common digestive system disorders.

4.2 The respiratory and cardiovascular system topic (2 hrs):

Basic anatomy of the respiratory and cardiovascular system, common circulatory system disorders and respiratory system disorders.

4.3 The immune system topics (2 hrs):

Basic anatomy of the immune system, physiology of the immune system, common immune system disorders.

4.4 The nervous system and special senses topics (2 hrs):

Structure and function, the central nervous system, the peripheral nervous system, the special senses, common nervous system disorders

4.5 The endocrine system topics (2 hrs):

Hormone function, pituitary, hypothalamus, and pineal glands, thyroid, parathyroid, and thymus glands, pancreas and adrenal glands, ovaries and testes

4.6 The reproductive systems topics (2 hrs):

Female reproductive system, menstrual cycle and childbirth, male reproductive system

Concept #5. Plant Biology (4 hrs)

5.1 The life of a flowering plant (2hrs)

5.2 The working plant (2hrs)

Presentation (8 hrs)

Spare/Revision/overruns (2 hrs)

**18. 教材及其它参考资料 Textbook and Supplementary Readings**

指定教材: Essential Biology with Physiology 4 ed. By Eric J. Simon, Jean L. Dickey and Jane B. Reece

Required: Essential Biology with Physiology 4 ed. By Eric J. Simon, Jean L. Dickey and Jane B. Reece

**课程评估 ASSESSMENT**

19. 评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		5		
课堂表现 Class Performance				
小测验 Quiz		10		
课程项目 Projects		20		
平时作业 Assignments		25		
期中考试 Mid-Term Test				
期末考试 Final Exam		40		
期末报告 Final Presentation				
其它（可根据需要 改写以上评估方式） Others (The above may be modified as necessary)				

20. 记分方式 GRADING SYSTEM

- A. 十三级等级制 Letter Grading  
 B. 二级记分制（通过/不通过） Pass/Fail Grading

**课程审批 REVIEW AND APPROVAL**

21. 本课程设置已经过以下责任人/委员会审议通过  
**This Course has been approved by the following person or committee of authority**

本课程经生物系本科教学指导委员会审议通过。  
 This Course has been approved by Undergraduate Teaching Steering Committee of Department of Biology.