

**National Chiayi University**  
**Department of**  
**Biochemical Science and Technology**  
(Applied for new students admitted at academic year 2010)

Meeting of curriculum committee of Department approved. 21, Jan, 2010

Meeting of curriculum committee of College approved. 27, Jan, 2010

Meeting of curriculum committee of School approved. 09, Mar, 2010

Meeting of academic affairs office approved.

**A. Characteristics :**

The course design emphasizes basic training in the field of biology and biochemistry specialties. It is classified into three areas: basic biochemistry, basic specialty field, and application technology. Course design uses living organisms as research subjects and chemistry as an experimental tool with focus on the understanding biochemistry mechanisms. Through the use of molecular biology and cell biology, students can easily understand a variety of biology and cell biology questions at the molecular level. As for training in the field of chemistry, it includes lectures and laboratory sessions in basic chemistry, organic chemistry, and analytical chemistry as well as in biochemistry, molecular biology, and cell biology, etc. Such rigorous course work will allow students to lay a solid foundation that will enable them to deal with various biological problems in the future.

**B. Goal :**

- a. Educating biochemical science and technology related knowledge.
- b. Training fundamental biochemical science and technology related professional competence.
- c. Laying the foundation of future development and essential civic literacy.
- d. Enhancing problem solving and teamwork ability.

**C. Indicators of Fundamental Competence :**

- a. Fundamental knowledge of biochemical science and technology.
- b. Application culture of biochemical science and technology.
- c. Ability of problem finding and problem solving.
- d. Ability of interpersonal communication and cooperation.
- e. Application and creative competence of biochemical science and technology.
- f. Researching and developing ability of biochemical science and technology.
- g. Humanism culture and social concerning.
- h. Self developing and enhancing ability.

Total number of credits needed for graduation : 128

Including :

Compulsory required course credits : 58  
Selective required course credits : 40  
General education credits : 30

<b>Freshman</b>					
<b>Compulsory required</b>					
<b>Course</b>	<b>Semester</b>	<b>Hours</b>	<b>Credits</b>	<b>Note</b>	<b>Indicator</b>
Biology	A	3.0	3		1
Biology Lab	A	3.0	1		1
General Chemistry	A	3.0	3		1
General Chemistry Lab	A	3.0	1		1
Calculus	A	3.0	3		2
Organic Chemistry	B	3.0	3		4
Organic Chemistry Lab	B	3.0	1		4
General Physics	B	2.0	2		5
General Physics Lab	B	3.0	1		5
Microbiology	B	3.0	3		1
Microbiology Lab	B	3.0	1		1
<b>Total credits of compulsory required course</b>			<b>22</b>		
<b>Selective required</b>					
<b>Course</b>	<b>Semester</b>	<b>Hours</b>	<b>Credits</b>	<b>Note</b>	<b>Indicator</b>
Introduction of Scientific Development I	A	2.0	2		7
Scientific Japanese I	A	2.0	2		7
Introduction of Scientific Development II	B	2.0	2		8
Scientific Japanese II	B	2.0	2		7
<b>Total credits of selective required course</b>			<b>8</b>		
<b>Total credits of academic year</b>			<b>30</b>		

\* Name of courses may be changed with the technology trends.

<b>Sophomore</b>					
<b>Compulsory required</b>					
<b>Course</b>	<b>Semester</b>	<b>Hours</b>	<b>Credits</b>	<b>Note</b>	<b>Indicator</b>
Analytical Chemistry	A	3.0	3		3
Analytical Chemistry Lab	A	3.0	1		3
Biochemistry I	A	4.0	4		2

<b>Sophomore</b>					
<b>Compulsory required</b>					
<b>Course</b>	<b>Semester</b>	<b>Hours</b>	<b>Credits</b>	<b>Note</b>	<b>Indicator</b>
Biochemistry Lab I	A	3.0	1		3
Bio-organic Chemistry	A	2.0	2		5
Physiology	A	3.0	3		1
Scientific Paper Reading and Analytic Methods I	A	2.0	1		7
Biochemistry I	B	4.0	4		2
Biochemistry Lab II	B	3.0	1		3
Scientific Paper Reading and Analytic Methods II	B	2.0	1		7
<b>Total credits of compulsory required course</b>			<b>21</b>		
<b>Selective required</b>					
<b>Course</b>	<b>Semester</b>	<b>Hours</b>	<b>Credits</b>	<b>Note</b>	<b>Indicator</b>
Molecular Genetics & Lab	A	4.0	3		2
Mycology	A	2.0	2		5
Plant Tissue Culture Techniques & Lab	A	4.0	3		2
Genetics and Evolution	A	2.0	2		4
Applied Microbiology	A	2.0	2		3
Introduction to Biotechnology	B	2.0	2		5
Cell Culture Techniques	B	2.0	2		4
Plant Physiology	B	2.0	2		3
Enzymology	B	2.0	2		5
Applied Biotechnology & Lab	B	4.0	4		4
<b>Total credits of selective required course</b>			<b>24</b>		
<b>Total credits of academic year</b>			<b>45</b>		

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<b>Junior</b>					
<b>Compulsory required</b>					
<b>Course</b>	<b>Semester</b>	<b>Hours</b>	<b>Credits</b>	<b>Note</b>	<b>Indicator</b>
Molecular Biology I	A	3.0	3		1
Molecular Biology Lab I	A	3.0	1		4

## Junior

### Compulsory required

Course	Semester	Hours	Credits	Note	Indicator
Immunology	A	2.0	2		1
Molecular Biology II	B	3.0	3		5
Molecular Biology Lab II	B	3.0	1		6
Seminar I	B	2.0	1		8
Cell Biology	B	2.0	2		6
Cell Biology Lab	B	3.0	1		6
<b>Total credits of compulsory required course</b>			<b>14</b>		

### Selective required

Course	Semester	Hours	Credits	Note	Indicator
Biostatistics	A	2.0	2		3
Embryology and Stem Cells	A	2.0	2		6
Biomaterial Application	A	2.0	2		3
Immunology Lab	A	3.0	1		4
Introduction to Neuroscience	A	2.0	2		5
Patent Search and Analysis	A	2.0	2		8
Special Topics I	A	2.0	2		8
Application of Cellular Signal Transduction	A	2.0	2		2
Cell Cycle and Checkpoint	A	2.0	2		2
Techniques of Protein Purification and Characterization	A	2.0	2		3
Principles and Applications of PCR	B	2.0	2		1
Molecular Carcinogenesis	B	2.0	2		5
Bioinformatics	B	2.0	2		7
Special Topics II	B	2.0	2		8
Proteomics	B	2.0	2		1
Developmental Biology	B	2.0	2		6
Development and Application of Medicinal Plants	B	2.0	2		6
Pharmacology	B	2.0	2		2

<b>Total credits of selective required course</b>	<b>35</b>	
<b>Total credits of academic year</b>	<b>49</b>	

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<b>Senior</b>					
<b>Compulsory required</b>					
<b>Course</b>	<b>Semester</b>	<b>Hours</b>	<b>Credits</b>	<b>Note</b>	<b>Indicator</b>
<b>Seminar II</b>	<b>A</b>	<b>2.0</b>	<b>1</b>		<b>8</b>
<b>Total credits of compulsory required course</b>			<b>1</b>		
<b>Selective required</b>					
<b>Course</b>	<b>Semester</b>	<b>Hours</b>	<b>Credits</b>	<b>Note</b>	<b>Indicator</b>
<b>Trends in Biotechnology Industry</b>	<b>A</b>	<b>2.0</b>	<b>2</b>		<b>7</b>
<b>Genomics</b>	<b>A</b>	<b>2.0</b>	<b>2</b>		<b>4</b>
<b>Special Topics III</b>	<b>A</b>	<b>1.0</b>	<b>1</b>		<b>8</b>
<b>Bio-Energy</b>	<b>B</b>	<b>2.0</b>	<b>2</b>		<b>6</b>
<b>Special Topics IV</b>	<b>B</b>	<b>1.0</b>	<b>1</b>		<b>8</b>
<b>Glycobiology</b>	<b>B</b>	<b>2.0</b>	<b>2</b>		<b>2</b>
<b>Total credits of selective required course</b>			<b>10</b>		
<b>Total credits of academic year</b>			<b>11</b>		

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