



中南民族大学

SOUTH-CENTRAL MINZU UNIVERSITY

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Degrees conferred: Bachelor of Engineering

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This major is aimed at the development of the health industry in China, cultivating individuals with socialist core values, a sense of social responsibility, awareness of the Chinese national community, and a solid foundation in biomedical, engineering, electronic, and information technology. Graduates should possess strong engineering development capabilities, innovative and entrepreneurial awareness, and the ability to innovate and start businesses. They should also have good humanistic qualities, a broad perspective on health, and an international outlook, making them high-quality and versatile talents. After graduation, they should be able to engage in education, research, development, management, and service work related to biomedical engineering, solving complex engineering problems in the field of life and health.

In about five years of work, they should be able to become technical backbones in their units, fields, or industries, achieving the following goals:

Objective 1: Possess a strong foundation in the humanities, engineering professional ethics, and a sense of social responsibility. Consider the impact of society, health, safety, law, and culture in engineering practice. Fulfill engineering responsibilities, foster a sense of community for the Chinese nation, and contribute to the health sector at the national, regional, and ethnic levels.

Objective 2: When addressing complex engineering problems in the field of biomedical engineering and related areas, be able to apply mathematical and natural science principles, utilize knowledge in biomedical engineering, engineering skills, and modern tools to analyze and research problems, and design feasible solutions.

Objective 3: In engineering projects within the field of biomedical engineering and related areas, possess capabilities in technical development, engineering practice, organizational management, and decision-making. Consider factors such as natural, social ethics, and sustainable development. Become a technical cornerstone, key personnel, or

organizational leader.

Objective 4: Possess excellent communication and expression abilities, as well as an

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1-1: Master fundamental knowledge in mathematics, natural sciences, and engineering foundations, and apply them appropriately to articulate problems in biomedical engineering.

1-2: Possess foundational theories and specialized knowledge in biomedical engineering, apply them to model and solve specific engineering problems in biomedical engineering and related fields.

1-3: Apply relevant engineering knowledge and mathematical modeling methods to deduce and analyze complex engineering problems in biomedical engineering and related fields.

1-4: Demonstrate systematic thinking, compare, and integrate relevant professional knowledge and mathematical models to formulate solutions for complex engineering problems in biomedical engineering and related fields.

2-1: Identify problems in biomedical engineering based on mathematical and natural

science principles, discerning critical components.

2-2: Express engineering problems in biomedical engineering accurately using principles of engineering science and mathematical modeling, recognizing diverse solution approaches.

2-3: Analyze complex engineering problems in biomedical engineering through the application of mathematical, natural science, and engineering principles, conduct literature research, and produce analysis reports leading to valid conclusions.

analyze and interpret data, and draw scientifically sound conclusions.

4-3: Properly analyze and interpret data, obtaining scientifically valid conclusions through information synthesis.

5-1: Understand principles and methods of commonly used modern instruments, information technology tools, engineering tools, and simulation software in biomedical engineering. Select and use appropriate tools to analyze, calculate, and design solutions for complex engineering problems.

5-2: Creatively use modern tools for simulation and prediction in various ways, such as combining, adapting, improving, or developing, to meet specific needs.

6-1: Understand technical standards, intellectual property, industry policies, laws, and regulations related to biomedical engineering and relevant fields. Recognize the impact of different social cultures on engineering activities.

6-2: Analyze and evaluate the impact of engineering practice on society, health, safety, law, culture, and understand the responsibilities involved.

7-1: Understand policies, regulations, and guidelines related to environmental protection

and sustainable development in industries associated with biomedical engineering.

7-2: Recognize responsibilities in engineering practices, accurately assess the impact of engineering activities on the environment and social sustainability, and contribute to the healthy development of national regions.

8-1: Develop a strong sense of community awareness, possess sound character, good humanistic and social science literacy, and correct values. Understand the relationship between the individual and society.

8-2: Adhere to engineering ethics, understand and comply with professional ethics and standards, and respect national and international laws and regulations.

8-3: Demonstrate a conscious commitment to the safety, health, and well-being of the public in engineering practice, understanding and accommodating diverse societal needs.

9-1: Collaborate and coordinate within interdisciplinary teams, effectively manage tasks, and assume responsibilities as an individual, team member, or leader.

9-2: Possess organizational and management skills, develop effective work plans, and allocate tasks according to team members' abilities and strengths, ensuring coordination and task completion.

10-1: Effectively communicate complex engineering problems in biomedical

engineering and related fields through oral or written means with peers and the public, using modern network tools for online communication.

10-2: Understand differences in ethnic and cultural backgrounds, demonstrate communication skills in cross-ethnic and cross-cultural contexts.

10-3: Have an international perspective, understanding international developments in theoretical research and technological advancements in biomedical engineering and related fields.

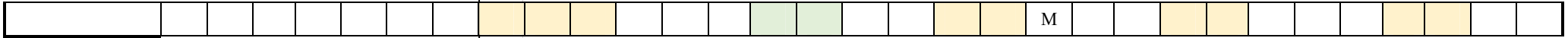
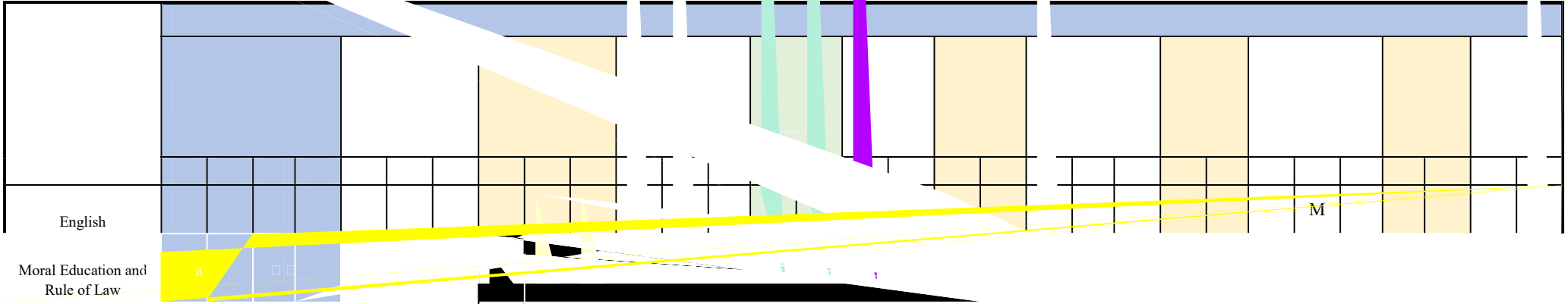
11-1: Understand issues related to engineering management, master basic principles of engineering management, economic analysis, and decision-making methods.

11-2: Apply systems engineering perspectives, theories, and methods to manage projects and solve problems within a multidisciplinary environment.

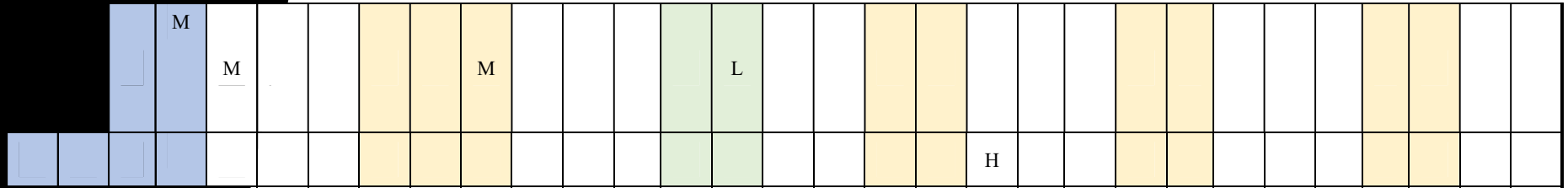
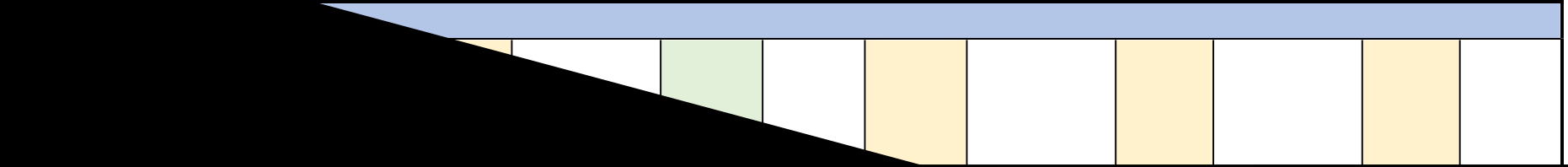
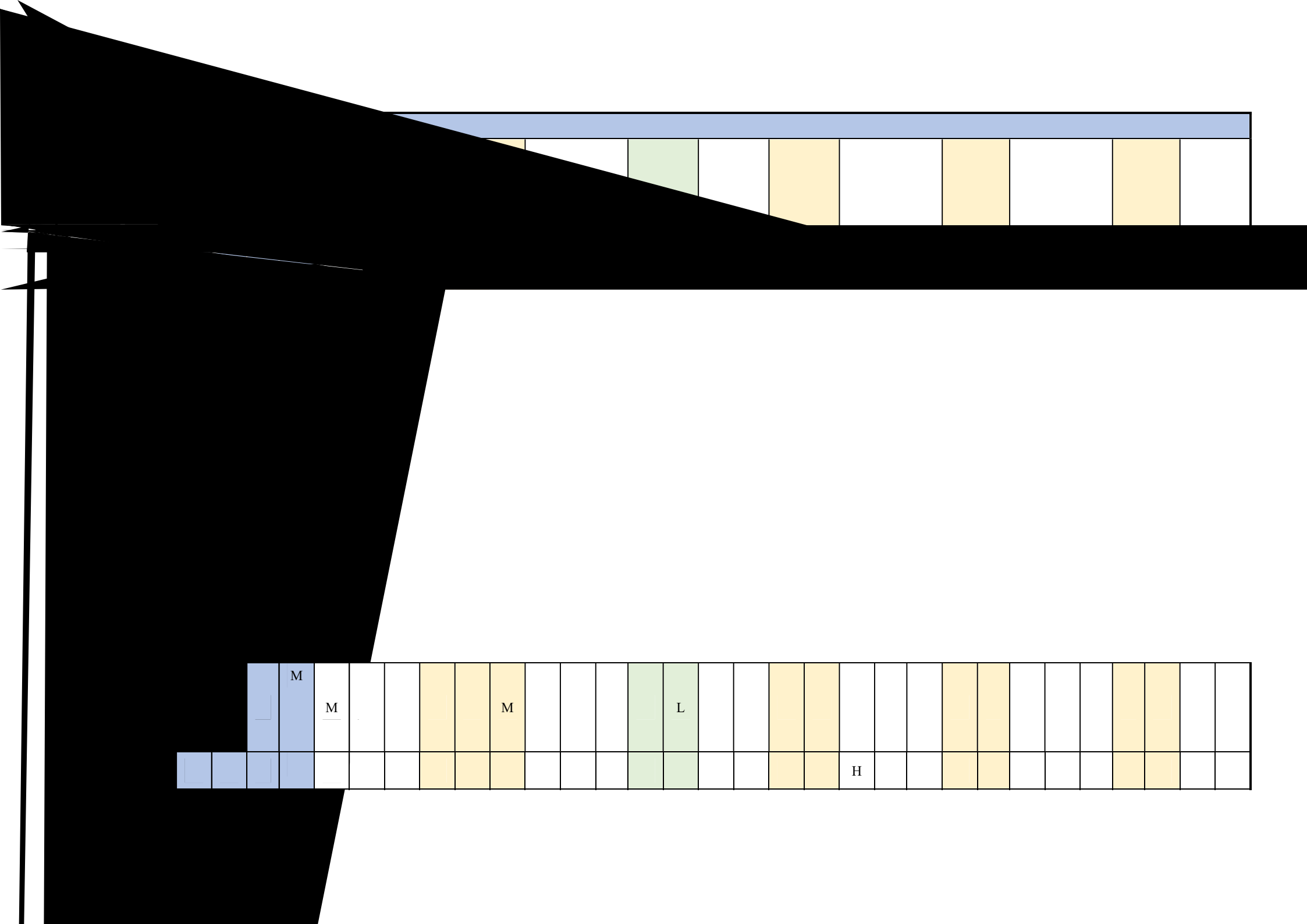
12-1: Demonstrate awareness of self-directed learning and the necessity of lifelong learning.

12-2: Master methods of self-directed learning and pathways to expand knowledge and improve skills. Possess the ability for continuous self-improvement to adapt to development.

Cultivation Objectives & Graduation Requirements	1 Cultivation Objective IV	2 Cultivation Objective II	3 Cultivation Objective III	4 Cultivation Objective	5 Cultivation Objective
1 Graduation Requirement I					
2 Graduation Requirement II					
3 Graduation Requirement VI					
4 Graduation Requirement					
5 Graduation Requirement					
6 Graduation Requirement					
7 Graduation Requirement					
8 Graduation Requirement					
9 Graduation Requirement					
10 Graduation Requirement					
11 Graduation Requirement XI					
12 Graduation Requirement XII					



	Overall Schedule Overview																											
	Semester 1				Semester 2				Summer				Semester 3				Semester 4											
	Mon	Tue	Wed	Thu	Mon	Tue	Wed	Thu	Mon	Tue	Wed	Thu	Mon	Tue	Wed	Thu	Mon	Tue	Wed	Thu	Mon	Tue	Wed	Thu	Mon	Tue	Wed	Thu
C Programming and Medical Applications																												
Circuit Analysis			H			M																						
College Physics	M																											
Lab of College Physics		M									L																	
Analog Electronic Experiment						M				M					L													
Analog Electronic Technology			H			M																						
Signal and System			H			M																						
EDA Digital Electronic Technology and EDA Experiment						M				M					L													
Digital Electronic Technology			H			M																						
Introduction to Biomedical Engineering															H				M									H



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A Engineering Training A															H				H											
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世 Professional Practice															H			M			M	M			M					
Practice of Graduation Design															M						M			H						
Undergraduate Thesis (Project)					M					M				H							H						H			L

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	Anatomy and Physiology	Circuit Analysis
	Analog Electronic Technology	Digital Electronic Technology
C	C Programming and Medical Applications	
Signal and System	Biomedical Digital Signal Processing	
	Biomedical Sensors	Medical Signal
Detection Technology and Instruments		Medical Imaging
Technology and Equipment		

	Anatomy and Physiology Experiment	Electrical
Engineering Practice		Course Design of Biomedical
Electronic Technology		Curriculum Design of Medical
Instrument and System		Comprehensive Experiment of Medical
Instruments		Comprehensive Practice of System Biomedical
Science	Systematic Biomedical Science Training	
	Innovation and Entrepreneurship 世	Professional Practice
Practice of Graduation		, Undergraduate Thesis (Project)

General Course Platform	Compulsory	594	25	7	18.82%	
	Elective	144	9	0	5.29%	
Basic Course Platform	Compulsory	920	41.5	5	27.35%	
世 Major Course Platform	Compulsory	364	16	3.5	11.47%	
	Elective	456	21	5	15.29%	
Practical Teaching Platform	Compulsory	72+26w	0	25	15.88%	
	Elective	2w	0	2		
Quality Development Platform	Innovation & Entrepreneurship Credits	Compulsory	/	/	5	
	Other Credits		92	4	1	
Amount	Compulsory Credits	133	Elective Credits	37	Proportion of Elective Credits	21.76%
	Theory Credits	116.5	Practice Credits	48.5	Proportion of Internship and Practical Training	25.59%
The Lowest Graduate Credits			170			

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20W100000613	1 English 1	2	32	32				1
218110000313	1 Physical Education 1	0/1	26			26		1
217100014918	Moral Education and Rule of Law	2.5/0.5	52	40		12		2
217100015218	Situation and Policy	2	32	32				2
225100000118	兴 Education of Chinese Minzu Community Consciousness	1.5/ 0.5	36	24		12		2
20W100000713	2 English 2	2	32	32				2
218110000213	2 Physical Education 2	0/1	32			32		2
2171000122	Essentials of China Modern and Contemporary History	2.5/ 0.5	52	40		12		3
20W100000813	3 English 3	2	32	32				3
218110015018	3 Physical Education 3	0/0.5	16			16		3

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218110014718	4 Physical Education 4	0/0.5	16			16		4
218110014018	5 Physical Education 3	0/0.5	16			16		5
218110015318	6 Physical Education 3	0/0.5	16			16		6
208100000613	Psychological Health of University Students	1	16	16				1

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八 Psychological Health and Safety	2
农 Humanistic Accomplishment and Writing	$\frac{2}{1}$
Science and Technology & Science Popularization	2
Art Appreciation and Aesthetics	1
Contemporary China and the World	1

Chinese Culture and

学科基础必修 Basic Courses Required	212100012318	Engineering Drafting	2/0.5	44	32	12			1	
	2101000118	Linear Algebra	2	48	32			16	1	
	2101000113	A(1) Advanced Mathematics A(1)	4	80	64			16	1	
	212100020218	C C Programming and Medical Applications	2/1	56	32	24			1	
	210102000413	A(2) Advanced Mathematics A(2)	5	96	80			16	2	
	212100012618	Circuit Analysis	3.5/0.5	76	56	12	8		2	
	211110021318	(1) Lab of College Physics A(1)	0/0.5	16	0	16			2	
	211100010918	A(1) College Physics A(1)	3	56	48			8	2	
	212110010518	Analog Electronic Experiment	0/1	24	0	24			3	
	212103005213	Analog Electronic Technology	3.5	64	56			8	3	
	211110022818	(2) Lab of College Physics A(2)	0/0.5	16	0	16			3	
	211100011018	A(2) College Physics A(2)	3	56	48			8	3	
	210102000513	Functions of Complex Variable	3	64	48			16	3	
	2101000112	Probability and mathematical statistics	2.5	56	40			16	3	
	212103003613	Signal and System	3.5	64	56			8	4	
	212110010618	EDA Digital Electronic Technology and EDA Experiment	0/1	24	0	24			4	
	212103003313	Digital Electronic Technology	3.5	64	56			8	4	
	212100022218	Engineering Management and Economic Decision	1	16	16				4	

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专业必修 Required Courses	212100013018	Introduction to Biomedical Engineering	1	24	16		8		1	
	212100013518	Biomedical Sensors	2.5/0.5	52	40	12			4	
	212113005113	Anatomy and Physiology Experiment	0/1	32	0	32			5	
	212103006213	Anatomy and Physiology	3.5	64	56			8	5	
	212100014818	Biomedical Digital Signal Processing	3/0.5	60	48	12			5	
	212100018918	Medical Signal Detection Technology and Instruments	3.5/0.5	68	56	12			5	
	212103004313	Medical Imaging Technology and Equipment	2.5	40	40				6	

212100011818	全 , Design of MCU and Embedded System (Course for Electronic Design Contest)	2/0.5	44	32	12			3
212103001913	Computer Netware	2	32	32				3
212100017718	Python Python Programming	2/0.5	44	32	12			3
212100011718	全 Embedded System	2/1	56	32	24			4
212100019818	Tissue Engineering	2/0.5	44	32	12			4
212100008913	Molecular Biology	2	32	32				4
212100012018	JAVA JAVA Programming	2/0.5	44	32	12			4
212103007713	Introduction to Medical Informatics	2	32	32				4
210103001513	C Discrete Mathematics C	2	32	32				4
212103003813	B, Data Structure (B)	2	32	32				4
212100018018	Machine Learning	2/0.5	44	32	12			4
212100011918	, Design of Electronic Circuit (Course for Electronic Design Contest)	1/1	40	16	24			4
212100011218	Virtual Instrument	1/0.5	28	16	12			5
212103006513	Biostatistics	2	32	32				5
212103001113	Introduction to Clinical Medicine	2	32	32				5
212100013618	Mechanical Design Foundation	2/0.5	44	32	12			5
212100012918	, Digital System Design (Bilingual)	2	32	32				5
212100011618	Programmable Digital System	1/1	40	16	24			5
212100015018	Database Technology and Applications	2/0.5	44	32	12			5
212100019218	Biochip	2	32	32				6

212100011418	Automatic Control Theory and Technology	2/0.5	44	32	12			6
212100010218	Medical Artificial Intelligence	2	32	32				6
212103002513	Intelligent Instrument	2	32	32				6
212100014918	PACS Telemedicine and PACS System	1/0.5	28	16	12			6
212103007113	Medical treatment equipment	2	32	32				6
212103006113	Medical laboratory and analytical instruments	2	32	32				6
212100011018	Medical Image Processing	2/0.5	44	32	12			6
212100020318	Microcomputer Principles and Interface Technology	2/0.5	44	32	12			6
212103001813	Bioelectronic Measurement (Bilingual)	2	32	32				6
212103000813	Biomedical Informatics (Bilingual)	2	32	32				6
212100016918	Medical Device Management and Regulations	2	32	32				6
212100020018	Ethics and professional norms of biomedical engineering	2	32	32				7
212103002713	Biophysics	2	32	32				7
212100011318	Mechanical Principle	2/0.5	44	32	12			7
212103006013	Simulation and Modeling of Biosystem	2	32	32				7
212103002413	Biomaterials	2	32	32				7
212103001713	Introduction to Biomedical photonics	2	32	32				7

实践 Practice	Course Practice	Compul sory Courses	112110010718	Labor Education	1	36			1-7	
			109110000318	军事技能训练 Military Skill Training	2	36			1	
		Elective Courses	212110019118	医学临床工程实践 Medical Clinical Engineering Practice	2	2W			7	2 1
			212110020718	医疗器械工程实践 Medical Device Engineering Practice	2	2W			7	
	Project Design	Compul sory Course	212110016518	生物医学电子课程设计 Course design of biomedical electronic technology	2	2W			5	
			212110021418	医学仪器及系统课程设计 Curriculum design of medical instrument and system	2	2W			6	
			212110020618	系统生物医学综合实践 Comprehensive Practice of System Biomedical Science	2	2W			5	

109100000418	于 Military Theory	2	36	36				1
109100000818	八 National Security Education	1	16	16				2
/	Art Practice	0/1	24			24		1-7
115100000113	Employment Guidance	1	16	16				6
/	Innovation Education	3	/					
/	Entrepreneurship Education	2	/					
Amount		10						

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Length of Schooling

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Duration: four years

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Degrees conferred: Bachelor of Engineering

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The Medical Information Engineering program is designed to meet the demands of building a healthy China. It aims to cultivate advanced engineering and technical professionals with a solid foundation in biomedical science, engineering technology, information science, and artificial intelligence. These individuals should embody the socialist core values, a sense of social responsibility, and awareness of the Chinese national community. The graduates are expected to possess strong capabilities in engineering development, innovation, communication, organizational management, and the ability to continuously update and enhance their knowledge.

Upon graduation, within approximately five years of professional experience, individuals in this field are expected to achieve the following goals:

Objective 1: Possessing a strong foundation in the humanities, engineering professional ethics, and a sense of social responsibility, considering the impact of society, health, safety, law, and culture in engineering practice. Fulfilling engineering responsibilities, fostering a sense of community for the Chinese nation, and contributing to the well-being of the country, regions, and ethnic areas in the field of health care.

Objective 2: When addressing complex engineering problems in the field of medical informatics and related areas, be able to utilize mathematical and natural science principles, apply specialized knowledge in medical informatics engineering, engineering skills, and modern tools to analyze and research problems, and design viable solutions.

Objective 3: In engineering projects within the field of medical informatics

and related areas, possess capabilities in technical development, engineering practice, organizational management, and decision-making. Able to consider factors such as natural, social ethics, and sustainable development, and become a technical cornerstone, key personnel, or organizational leader.

Objective 4: Possess excellent communication and expression abilities, as well as an international perspective, and be able to contribute effectively in multicultural, multidisciplinary, and cross-cultural environments and teams.

Objective 5: Demonstrate awareness of lifelong learning and self-directed learning, stay abreast of the latest theories, technologies, and trends in the field of medical informatics engineering, and possess the ability to continuously adapt to societal development and industry competition.

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1-1: Master foundational knowledge in mathematics, natural sciences, and engineering. Apply these appropriately to articulate problems in the field of biomedical engineering.

1-2: Acquire foundational theories and specialized knowledge in biomedical engineering for modeling and solving specific engineering problems in medical informatics and related fields.

1-3: Apply relevant engineering knowledge and mathematical modeling methods to deduce and analyze complex engineering problems in medical informatics and related areas.

1-4: Demonstrate systematic thinking by comparing and integrating relevant

professional knowledge and mathematical models to formulate solutions for complex engineering problems in medical informatics and related fields.

2-1: Identify problems in the field of medical informatics engineering based on basic principles of mathematics and natural sciences, recognizing key aspects.

2-2: Express engineering problems in the field of medical informatics correctly based on the basic principles of engineering science and mathematical modeling. Recognize the diversity of solution approaches.

2-3: Utilize basic principles of mathematics, natural sciences, and engineering science, along with literature research, to analyze complex engineering problems in medical informatics and present analysis reports with valid conclusions.

3-1: Master basic methods and techniques for system design and product development in biomedical engineering and related fields. Provide technical solutions for complex engineering problems in line with design objectives.

3-2: Design algorithms, circuits, software, or systems that meet specific requirements for complex engineering problems in medical informatics and related fields within the framework of solutions.

3-3: Demonstrate innovation in engineering design, considering factors such as public health and safety, energy conservation, environmental protection, legal and ethical aspects, as well as social and cultural factors.

4-1: Conduct research on complex engineering problems in the field of

medical informatics and related areas based on scientific principles and methods, including system design, data analysis, and interpretation, to obtain reasonable and effective conclusions.

4-2: Investigate and analyze solutions to complex engineering problems through literature research or relevant methods based on foundational theories and scientific principles in medical informatics engineering.

4-3: Analyze and interpret data accurately, obtaining scientifically sound conclusions through comprehensive information synthesis.

5-1: Understand the principles and methods of commonly used modern instruments, information technology tools, engineering tools, and simulation software in the field of biomedical engineering. Choose and use appropriate tools for analysis, calculation, and design of complex engineering problems.

5-2: Creatively use modern tools for simulation and prediction in various ways, such as combining, selecting, adapting, or improving, to meet specific needs for solving complex engineering problems.

6-1: Understand the technical standard system, intellectual property, industry policies, and regulations in medical informatics engineering and related fields. Recognize the influence of different social cultures on engineering activities.

6-2: Analyze and evaluate the impact of engineering practices on society, health, safety, law, culture, and understand the responsibilities that need to be assumed based on knowledge of medical informatics engineering and related backgrounds.

7-1: Understand policies, regulations, and laws related to environmental protection and sustainable development in industries relevant to medical informatics engineering.

7-2: Recognize responsibilities in engineering practices, accurately assess the impact of engineering practices on the environment, social sustainability, and promote the healthy development of ethnic regions.

8-1: Firmly establish a sense of community for the Chinese nation, possess a sound character, good humanities and social science literacy, correct values, and understand the relationship between individuals and society.

8-2: Adhere to engineering ethics, understand and comply with professional ethics and standards, and respect national and internationally recognized laws and regulations.

8-3: In engineering practice, consciously fulfill the engineer's responsibility to the safety, health, and well-being of the public, understanding and accommodating diverse social needs.

9-1: Function effectively in teams with diverse disciplinary backgrounds, correctly manage individual and team relationships, take on responsibilities as team members, and complete assigned tasks.

9-2: Possess organizational management skills, develop effective work plans, and reasonably allocate tasks based on the capabilities and strengths of team members, coordinate progress, and accomplish tasks.

10-1: Effectively communicate and interact with peers in the industry and the general public on complex engineering problems, including writing reports and designing documents, making presentations, expressing thoughts clearly, and responding to instructions. Have an international perspective and communicate in cross-cultural contexts.

10-2: Clearly and accurately express professional issues in medical informatics engineering and related fields orally or in writing, communicate effectively with peers in the industry and the general public, and use modern network tools for online communication.

10-3: Understand differences in ethnicity and culture, possess the ability to communicate in cross-ethnic and cross-cultural contexts, and have a certain international perspective, understanding international trends in theoretical research and technological development in biomedical engineering and related fields.

11-1: Understand issues related to project management, master basic principles of engineering management, economic analysis, and decision-making methods.

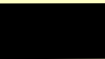
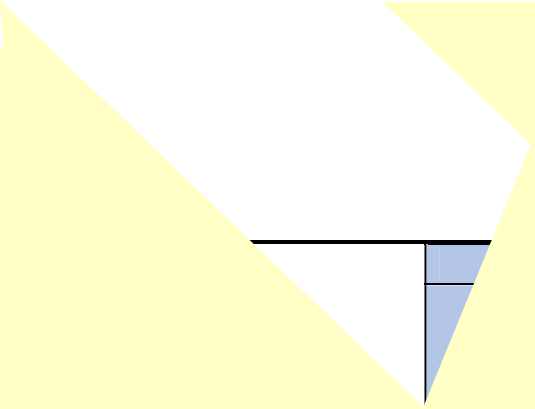
11-2: Apply systems engineering perspectives, theories, and methods to manage projects and solve problems in a multidisciplinary environment.

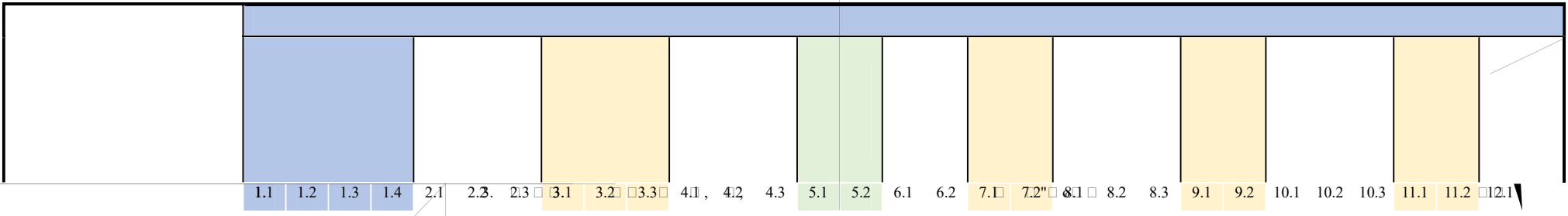
12-1: Demonstrate awareness of self-directed learning and the importance of lifelong learning.

12-2: Master methods of self-directed learning and ways to expand knowledge and enhance capabilities, possessing the ability to self-improve to adapt to development continually.

Cultivation Objectives & Graduation Requirements	1 Cultivation Objective IV	2 Cultivation Objective II	3 Cultivation Objective III	4 Cultivation Objective	5 Cultivation Objective
1 Graduation Requirement I					
Graduation Requirement					
Graduation Requirement					
Graduation Requirement					
5 Graduation Requirement					
6 Graduation Requirement					
7 Graduation Requirement					
8 Graduation Requirement					
9 Graduation Requirement					

	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7.1	7.2	8.1	8.2	8.3	9.1	9.2	10.1	10.2	10.3	11.1	11.2	12.1	12.2
English																										M					
Moral Education and Rule of Law																				M											
Situation and Policy 兴																		M		M											M
Education of Chinese Minzu Community Consciousness																				M											
Essentials of China Modern and Contemporary History																				M											
Basis Principles of Marxism																				M											
Introduction to MAO Zedong Thought and Socialist Theoretical System with Chinese Characteristics																				M											





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Anatomy and Physiology C C Programming
and Medical Application Signal and System Digital
Electronic Technology Biomedical Digital Signal
Processing Database System Data Structure
Information and Coding Medical Information System
Software Engineering

		Elective	144	9	0	5.29%
Basic Course Platform		Compulsory	920	41.5	5	27.35%
世 Major Course Platform		Compulsory	376	16	4	11.76%
		Elective	456	21.5	4	15.00%
Practical Teaching Platform		Compulsory	72+26w	0	25	15.88%
		Elective	2w	0	2	
Quality Development Platform	Innovation & Entrepreneurship Credits	Compulsory	/	/	5	2.94%
	Other Credits		92	4	1	2.94%
Amount	Compulsory Credits	133.5	Elective Credits	36.5	Proportion of Elective Credits	21.47%
	Theory Credits	117	Practice Credits	48	Proportion of Internship and Practical Training	25.29%
The Lowest Graduate Credits			170			

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20W100000613	1 English 1 English 1	2.5/0.5	32	32	15	2	212
218110000313	1 Physical Education 1	0/1	26				1
217100014918	Moral Education and Rule of Law	2.5/0.5	52	40	12		2
217100015218	Situation and Policy	2	32	32			
22510001118	Education of Chinese Minzu Community Consciousness	1.5/ 0.5	36	(24)	12		2

20W100000713

217100015918	Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	2.5/0.5	52	40		12		6
20W100000913	4 English 4	2	32	32				4
218110014718	4 Physical Education 4	0/0.5	16			16		4
218110014018	5 Physical Education 3	0/0.5	16			16		5
218110015318	6 Physical Education 3	0/0.5	16			16		6
208100000613	Psychological Health of University Students	1	16	16				1

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	212100012318	Engineering Drafting	3		60	02			
	2101000118	Linear Algebra	2	48	32		16	1	
	2101000113	Advanced Mathematics A(1)	4	60	54	4	16	1	

学科基础必修

Basic Courses Required

21210015118	Analytic Experiment for Cells and Molecules	0/1	24	0	24			3
212100009113	Medical Cell Biology	2	32	32				3
212100011818	全 , Design of MCU and Embedded System (Course for Electronic Design Contest)	2/0.5	44	32	12			3
212103001913	Computer Netware	2	32	32				3
212100017718	Python	2/0.5	44	32	12			3
212100018218	C# C# Programming	2.5	44	32	12			4
212100011718	全 Embedded System Design	2/1	56	32	24			5
212100019818 212103031513	Tissue Engineering	2/0.5 2	48 32	32 32	12			4 4
212100008913	Molecular Biology	2	32	32				4
212100012018	JAVA JAVA Programming	2/0.5	44	32	12			4
210103001513 212100018018	C Discrete Mathematics C	2 2	32 64	32 22				4 4
212100018018	Machine Learning	2/0.5	44	32	12			4

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212100014918	PACS Telemedicine and PACS System	1/0.5	28	16	12			6
212103006113	Medical laboratory and analytical instruments	2	32	32				6
212100011018	Medical Image Processing	2/0.5	44	32	12			6
212100020318	Microcomputer Principles and Interface Technology	2/0.5	44	32	12			6
212103000813	, Biomedical Informatics (Bilingual)	2	32	32				6
212100016918	Medical Device Management and Regulations	2	32	32				6
212100020018	Ethics and professional norms of biomedical engineering	2	32	32				7
212100020118	Introduction to hospital	2	32	32				7
212103007813	八 Information Security	2	32	32				7
212103001613	, Data Structure and Algorithm Analysis (Bilingual)	2	32	32				7
212100014618	User Interface Design	1/0.5	28	16	12			7
212100014718	Analysis and Design of Information System	1/0.5	28	16	12			7

	212100012818	Software Testing Technology	1/0.5	28	16	12			7	
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实践 Practice	Course Practice	Compul sory Courses	112110010718	Labor Education	1	36			1-7	
			109110000318	于 Military Skill Training	2	36			1	
		Elective Courses	212110019918	Medical information Engineering Practice	2	2W			7	
			212110019118	Medical Clinical Engineering Practice	2	2W			7	
	Project Design	Compul sory Course	212110021518	Project of Medical information Software Technique Design	2	2W			5	
			212110021218	Medical Information System Design	2	2W			6	
		Elective Courses								
	Amount									
	实习 internship	世 Course internship	Compul sory Course	212110019018	世 Professional recognizing practice	1	1W		√	2
				21211001081 8	Electrical Engineering Training	1	1W		√	2
701110000118				D Engineering training D	2	2W		√	5	
212110020918				世 Professional Practice	2	2W		√	5	
Graduation internship		Compul sory Course	01844040	Practice of Graduation Design	2	4W		√	8	

Graduation Thesis (Project)	Compulsory Course	01845010	Undergraduate Thesis	10	12W			8
Amount		18						

109100000418	军事理论 Military Theory	2	36	36				1
109100000818	国家安全教育 National Security Education	1	16	16				2
/	艺术实践 Art Practice	0/1	24			24		1-7
115100000113	就业指导 Employment Guidance	1	16	16				6
/	创新创业教育 Innovation Education	3	/					
/	创业教育 Entrepreneurship Education	2	/					
Amount		10						

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Length of Schooling

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Duration: 4 years

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Degree

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Degrees conferred: Bachelor of Engineering degree

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The "Outstanding Engineer Program in Intelligent Medical Engineering of Biomedical Engineering" is dedicated to addressing the significant national demand of "Healthy China 2030." The program is committed to cultivating versatile and outstanding talents with a sense of national pride, awareness of the Chinese national community, and a humanistic care consciousness. These talents are expected to possess solid foundational knowledge in biomedical sciences, engineering technology, information science, and artificial intelligence. They should also demonstrate strong capabilities in engineering development and innovation, communication and organizational management, continuous learning, and self-improvement.

Graduates of this program should be capable of engaging in research, management, service, and education in the fields of intelligent medical instrument development, intelligent medical system construction, intelligent medical data mining, and related areas. They may pursue careers in medical research institutes, universities, artificial intelligence, and enterprises involved in intelligent medical technology. Additionally, they can contribute to precision medicine, intelligent surgery, intelligent rehabilitation, intelligent diagnostics, intelligent medical information processing, and remote healthcare in the fields of medicine and

biology.

The program aims for students to achieve the following goals approximately five years after graduation:

Objective 1: Possess a strong foundation in humanities, engineering professional ethics, and a sense of social responsibility. In engineering practice, fully consider the impact of social, health, safety, legal, and cultural factors, fulfill the responsibilities of an engineer, foster a sense of the Chinese national community, and contribute to the health sector at the national, regional, and ethnic levels.

Objective 2: When addressing complex engineering problems in the field of intelligent medical engineering and related areas, apply mathematical and natural science principles. Utilize knowledge from biomedical engineering, electronics, computer technology, artificial intelligence, and modern tools to analyze and research problems and design feasible solutions.

Objective 3: Possess the ability to research and develop intelligent medical products, process intelligent medical information, and mine medical big data. Competent in technical leadership, business operations, and management roles in enterprises related to intelligent medical engineering.

Objective 4: Have effective communication and expression skills, along with an international perspective. Capable of contributing in diverse, multi-ethnic, multidisciplinary, cross-cultural environments, and teams.

Objective 5: Demonstrate awareness of lifelong learning and self-directed learning. Keep abreast of the latest theories, technologies, and trends in the field of intelligent medical engineering, and possess the ability to continuously adapt to societal development and industry competition.

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This major primarily covers fundamental theories and knowledge in the series of courses related to circuits and electronics, computer science, medical imaging principles and equipment, medical image processing, medical signals and systems. Students also undergo basic training in metalworking, electronic technology, and acquire essential capabilities in the design, development, management, and operation of medical intelligent systems and medical instruments. The program aims to cultivate qualities such as engineering practicality, scientific research literacy, comprehensive skills, and innovation spirit.

Knowledge, abilities, and qualities that graduates of this major should possess:

Apply mathematical, natural science, medical, engineering fundamentals, and artificial intelligence technology to solve complex engineering problems in the field of intelligent medical engineering.

Apply the basic principles of mathematics, natural science, and engineering science to identify, express, and analyze complex engineering problems in clinical medicine, intelligent medical information processing, and the design and manufacturing of intelligent medical instruments through literature research to obtain effective conclusions.

Design solutions for complex engineering problems in the field of intelligent medicine, design diagnostic and treatment systems that meet specific requirements, and demonstrate innovative awareness in the design process, considering social, health, safety, legal, cultural, and environmental factors.

Conduct research in the field of intelligent medical engineering based on scientific principles and using scientific methods. This includes designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.

Ability to develop, select, and use appropriate technologies, resources, modern engineering tools, and information technology tools for complex engineering problems in the field of intelligent medical engineering. This includes predicting and simulating complex

engineering problems and understanding their limitations.

Ability to conduct a reasonable analysis based on relevant background knowledge in the field of intelligent medical engineering, evaluate the impact of engineering practices and solutions to complex engineering problems on society, health, safety, law, culture, and understand the responsibilities involved.

Ability to understand and evaluate the impact of engineering practices on the environment and social sustainability in the face of complex engineering problems in the field of intelligent medical engineering.

Possession of humanities and social science literacy, a sense of social responsibility, and the ability to understand and adhere to engineering professional ethics and standards in the practice of intelligent medical engineering. Fulfillment of responsibilities is expected.

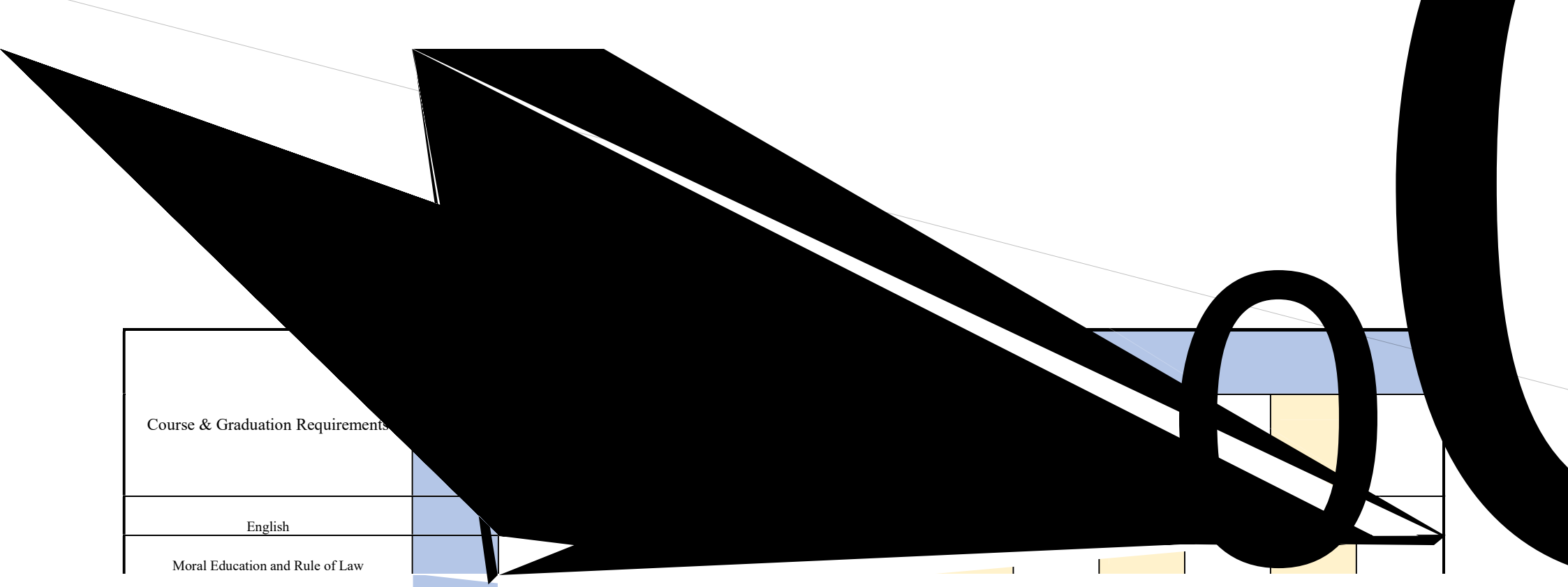
Ability to assume roles as individuals, team members, and leaders in a multidisciplinary team.

Ability to effectively communicate and interact with peers in the industry and the general public on complex engineering problems in the field of intelligent medical engineering. This includes writing reports and design documents, making presentations, expressing oneself clearly, responding to instructions, and having a certain international perspective for communication in cross-cultural contexts.

Understanding and mastery of engineering management principles and economic decision-making methods, and the ability to apply them in a multidisciplinary environment.

Awareness of self-directed learning and lifelong learning, with the ability to continuously learn and adapt to development.

Cultivation Objectives & Graduation Requirements	¹ Cultivation Objective I	² Cultivation Objective II	³ Cultivation Objective III	⁴ Cultivation Objective IV	⁵ Cultivation Objective V
¹ Graduation Requirement I		√			
² Graduation Requirement II		√			√
³ Graduation Requirement III		√	√		√
⁴ Graduation Requirement IV		√	√		√
⁵ Graduation Requirement V		√	√		
⁶ Graduation Requirement VI	√		√		
⁷ Graduation Requirement VII	√		√		
⁸ Graduation Requirement VIII	√				
⁹ Graduation Requirement IX			√	√	
¹⁰ Graduation Requirement X				√	
¹¹ Graduation Requirement XI			√	√	
¹² Graduation Requirement XII					√



Course & Graduation Requirements		
English		
Moral Education and Rule of Law		

Situation and Education 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Course & Graduation Requirements												
I , Intelligent Medical Engineering Course Design I (Medical Signal Analysis)		M	H		M				M		L	
II , Intelligent Medical Engineering Course Design II (Medical Artificial Intelligence)		M	H		M				M		L	
Electrical Engineering Training					M					M		
A Engineering Training A						H		H				
世 Professional recognizing practice						M	L					M
世 I Professional Practice I						H	M	M	M	M		
世 II Professional Practice II						H	M	M	M	M		
Practice of Graduation Design						M		M		H		
, Undergraduate Thesis (Project)	M	M	H	H						H		L

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Anatomy and Physiology Circuit Analysis
Analog Electronic Technology Digital Electronic Technology C
C Programming and Medical Applications Signal and System
Biomedical Digital Signal Processing Biomedical
Sensors Medical Signal Detection Technology and Instruments
Machine Learning Deep Learning

Anatomy and Physiology Experiment

Analog



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20W100000613	1 English 1	2	32	32				1
218110000313	1 Physical Education 1	0/1	26			26		1

217100015918	Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	2.5/0.5	52	40		12		6
20W100000913	4 English 4	2	32	32				4
218110014718	4 Physical Education 4	0/0.5	16			16		4
218110014018	5 Physical Education 3	0/0.5	16			16		5
218110015318	6 Physical Education 3	0/0.5	16			16		6
208100000613	Psychological Health of University Students	1	16	16				1

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八 Psychological Health and Safety	2
农 Humanistic Accomplishment and Writing	2
Science and Technology & Science Popularization	2
Art Appreciation and Aesthetics	1
Contemporary China and the World	1
Chinese Culture and Civilization	1

	212100012318	Engineering Drafting	2/0.5	44	32	12			1	
	2101000118	Linear Algebra	2	48	32			16	1	
	2101000113	A(1) Advanced Mathematics A(1)	4	80	64			16	1	
	212100020218	C C Programming and Medical Applications	2/1	56	32	24			1	
	210102000413	A(2) Advanced Mathematics A(2)	5	96	80			16	2	
	212100012618	Circuit Analysis	3.5/0.5	76	56	12	8		2	
	211110021318	(1) Lab of College Physics A(1)	0/0.5	16	0	16			2	
	211100010918	A(1) College Physics A(1)	3	56	48			8	2	
	212110010518	Analog Electronic Experiment	0/1	32	0	32			3	
	212103005213	Analog Electronic Technology	3.5	64	56			8	3	
	211110022818	(2) Lab of College Physics A(2)	0/0.5	16	0	16			3	
	211100011018	A(2) College Physics A(2)	3	56	48			8	3	

学科基础必修
Basic Courses Required

210102000513	Functions of Complex Variable	3	64	48			16	3	
2101000112	Probability and mathematical statistics	2.5	56	40			16	3	
212103003613	Signal and System	3.5	64	56			8	4	
212113004513	EDA Digital Electronic Technology and EDA Experiment	0/1	32	0	32			4	
212103003313	Digital Electronic Technology	3.5	64	56			8	4	
212100018018	Machine Learning	2/0.5	44	32	12			4	

212100022218 Engineering Management and Economic D mi21212 216 46

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专业必修 Required Courses	212100013018	Introduction to Biomedical Engineering	1	24	16		8		1	
	212100013518	Biomedical Sensors	2.5/0.5	52	40	12			4	
	212100018818	Deep Learning	1.5/0.5	36	24	12			5	
	212113005113	Anatomy and Physiology Experiment	0/1	32	0	32			5	
	212103006213	Anatomy and Physiology	3.5	64	56			8	5	
	212100014818	Biomedical Digital Signal Processing	3/0.5	60	48	12			5	
	212100018918	Medical Signal Detection Technology and Instruments	3.5/0.5	68	56	12			5	

专业选修
Elective courses

212100019718	Biochemistry	2/1	56	32	24			3
212100012118	C++ C++ Programming	2/0.5	44	32	12			3
212110015118	Analytic Experiment for Cells and Molecules	0/1	24	0	24			3
212100009113	Medical Cell Biology	2	32	32				3
212100011818	全 , Design of MCU and Embedded System (Course for Electronic Design Contest)	2/0.5	44	32	12			3
212103001913	Computer Netware	2	32	32				3
212100017718	Python Python Programming	2/0.5	44	32	12			3
212100019318	Big Data Analysis	1.5/0.5	36	24	12			4
212100019818	Tissue Engineering	2/0.5	48	32	12			4
212100008913	Molecular Biology	2	32	32				4
212100012018	JAVA JAVA Programming	2/0.5	44	32	12			4
210103001513	C Discrete Mathematics C	2	32	32				4
212103003813	B, Data Structure (B)	2	32	32				4
212100011918	, Design of Electronic Circuit (Course for Electronic Design Contest)	1/1	40	16	24			4
212100011718	全 Embedded System	2/1	56	32	24			4
212103007713	Introduction to Medical Informatics	2	32	32				4

212103004313	Medical Imaging Technology and Equipment	2.5	40	40				5
212100017318	APP Mobile Medical APP Development and Application	2/0.5	32	32	12			5
212103006513	Biostatistics	2	32	32				5
212103001113	Introduction to Clinical Medicine	2	32	32				5
212100013618	Mechanical Design Foundation	2/0.5	44	32	12			5
212100012918	Digital System Design (Bilingual)	2	32	32				5
212100011618	Programmable Digital System	1/1	40	16	24			5
212100015018	Database Technology and Applications	2/0.5	44	32	12			5
212100017218	Computer Vision Technology	2/0.5	44	32	12			6
212100019518	Natural Language Processing	1.5/0.5	36	24	12			6
212100019218	Biochip	2	32	32				6
212100011418	Automatic Control Theory and Technology	2/0.5	44	32	12			6
212103002513	Intelligent Instrument	2	32	32				6
212100014918	PACS Telemedicine and PACS System	1/0.5	28	16	12			6
212103007113	Medical treatment equipment	2	32	32				6

212103006113	Medical laboratory and analytical instruments	2	32	32			6	6
212100011018	Medical Image Processing	2/0.5	44	32	12			6
212100020318	Microcomputer Principles and Interface Technology	2/0.5	44	32	12			6
212103001813	Bioelectronic Measurement Bilingual,	2	32	32				6
212103000813	Biomedical Informatics Bilingual,	2	32	32				6
212100016918	Medical Device Management and Regulations	2	32	32				6
212100020018	Ethics and professional norms of biomedical engineering	2	32	32				7
212103002713	Biophysics	2	32	32				7
212100011318	Mechanical Principle	2/0.5	44	32	12			7
212103006013	Simulation and Modeling of Biosystem	2	32	32				7
212103002413	Biomaterials	2	32	32				7
212103001713	Introduction to biomedical photonics	2	32	32				7

实践 Practice	Course Practice	Compul sory Courses	112110010718	Labor Education	1	36			1-7	
			109110000318	军事技能训练 Military Skill Training	2	36			1	
		Elective Courses	212110019118	Medical Clinical Engineering Practice	2	2W			7	
			212110020718	Medical Device Engineering Practice	2	2W			7	
	Project Design	Compul sory Course	212110019418	(, Course Design of Biomedical Electronic System (Medical Instrument Design)	2	2W			4	
			212110020418	I Intelligent Medical Engineering Course Design I (Medical Signal Analysis)	2	2W			5	
			212110021018	II Intelligent Medical Engineering Course Design II (Medical Artificial Intelligence)	2	2W			6	
	Amount									
	校外 internship	世 Course internship	Compul sory Course	212110019018	世 Professional recognizing practice	1	1W			2
				212110010818	Electrical Engineering Training	0/1	1W			2
701110000118				D Engineering training D	2	2W			5	
212110021618				世 I Professional Practice I	1	1W			4	
212110021318				世 II Professional Practice II	1	1w			5	
Graduation internship		Compul sory Course	01844040	Practice of Graduation Design	2	4W			8	

Graduation Thesis (Project)	Compulsory Course	01845010	Undergraduate Thesis	10	12W			8
Amount								

109100000418	军事理论 Military Theory	2	36	36				1
109100000818	国家安全教育 National Security Education	1	16	16				2
/	艺术实践 Art Practice	0/1	24			24		1-7
115100000113	就业指导 Employment Guidance	1	16	16				6 , 8 ,
/	创新创业教育 Innovation Education	3	/					
/	创业教育 Entrepreneurship Education	2	/					
Amount		10						