



# Graduate Program for Instrument Science and Technology

School	School of Physics and Mechanical & Electrical Engineer	Student Type	Master & PhD
Discipline	Instrument Science and Technology	Discipline Code	0804
Subject included	Precision Instrument and Machinery (080401); Measurement Technology and Instrumentation (080402); Electrical Testing Technology and Instrumentation (0804Z1)		
Length of Study	Master <u>3</u> years; PhD <u>4</u> years		
Credit	Master $\geq 23$ credits: $\geq 20$ credits for courses, <u>3</u> credits for other academic sections.		
Requirements	PhD $\geq 12$ credits: $\geq 8$ credits for courses, <u>4</u> credits for other academic sections.		
Program Objectives	<p>1. This program aims to cultivate high-quality, innovative, and professional talents (1) having a good command of Marxism-Leninism, Mao Zedong Thought and Deng Xiaoping Thought; (2) adhering to the Four Basic Principles and support the reform and opening-up policy; (3) being dedicated to their motherland; (4) upholding the leadership of the Communist Party of China and socialist system; (5) being willing to strive for China's modernization; (6) having a good grasp of the basic theories and specialized knowledge of mechanical engineering; and (7) being eligible for doing scientific research, teaching, managing, and undertaking technical tasks.</p> <p>2. Candidates are expected to (1) grasp basic theories and specialized knowledge of instrument science and technology; (2) be fully aware of the development of their chosen field, and its research front at home and abroad; (3) be competent in conducting theoretical and experiential research; (4) be of the ability to detect, analyze and solve problems; (5) be proficient in at least one foreign language and can read relevant literature written in the foreign language; (6) do well in academic writing and academic exchanges; and (7) be eligible for doing research, teaching, managing in the field of instrument science and technology and its relevant fields.</p> <p>3. This program aims to cultivate high-quality professionals proficient in researching, teaching, engineering application, and developing technology in the field of precision instrument, precision optical machinery, measurement technology, testing and sensor technology, scientific instruments, optical-mechanical-electric technology and industrial automation.</p> <p>Masters are expected to:</p> <p>(1) grasp the basic theories and specialized knowledge of mechanical engineering.;</p> <p>(2) be of the ability to do scientific research and solve practical problems.;</p> <p>(3) be of the ability to conduct researches and academic communications in at least one foreign language.</p>		



	PhDs are expected to: (1) grasp the basic theories and specialized knowledge systematically and proudly; (2) be of the ability to conduct scientific researches independently and creatively; (3) be of the ability to see things from an international perspective and engage in international academic exchanges fluently.						
Requirements of Research Ability and Other Aspects	Masters and PhDs are required to: 1. complete all the courses prescribed, and grasp the basic theories of and specialized knowledge about mechanical engineering. 2. be proficient in at least one foreign language, writing academic papers and conducting international communication. 3. complete publication tasks (for degree application) designated by the academic degree committee of the school. 4. be of the ability to do scientific research or engineering design with high-technology in the field of instrument science and technology, and be eligible for teaching, researching, and managing in its relevant fields.						
<b>Curriculum</b> (*SP-Spring semester; FA-Fall semester; SU-Summer semester; C-Compulsory; O-Optional)							
Category	Course Code	Course Name	Credit	Semester	Master	PhD	Remarks
General Courses: Master <u>4</u> credits, PhD <u>2</u> credits	000010101	China's Marxism and Contemporary	2	FA		C	
	000010201	First foreign language	2	FA\SP	C	O	
	000010102	Study on theory and practice of socialism with Chinese characteristics	1	FA\SP	C	O	
	000010104	Dialectics of nature	1	FA	C	O	
Compulsory Courses: Master $\geq 2$ credits, PhD $\geq 1$ credit	090010001	Numerical Analysis	3	FA	C	O	
	090210001	Modern control theory	3	FA	C	O	
	090210003	Instrument Science and technology frontier	2	SP	C	O	
	090010003	Literature retrieval and Scientific writing in English	1	SP	C	C	
Optional Courses	090010002	Matrix Theory	3	FA	O	O	
	090220006	The computer control system experiment	2	SP	O	O	
	090220007	Modal analysis and system identification	2	FA	O	O	



	090220008	Electro optical technology	2	FA	O	O	
	090220009	Modern sensor technology	2	FA	O	O	
	090220010	Modern optics	2	FA	O	O	
	090220011	The precise detection technology	2	FA	O	O	
	090230007	Design and manufacture of high precision optical	2	FA	O	O	
	090230009	finite element analysis	2	FA	O	O	
	090230016	Micro electromechanical system design and process	2	FA	O	O	
	090230017	Micro nano detection and analysis technology	2	FA	O	O	
	090230018	Micro fluid and its application	2	SP	O	O	
	090230019	Condition monitoring and fault detection	2	SP	O	O	
	090230020	Advanced artificial intelligence	2	FA	O	O	
	090230021	Advanced Software Engineering	2	FA	O	O	
	090230022	Machine vision and application	2	FA	O	O	
	090230023	Weak signal detection	2	SP	O	O	
	090230024	Advanced power electronics	2	FA	O	O	
	090230025	Analysis instrument Introduction	2	FA	O	O	
	090230026	CMOS circuit design	2	FA	O	O	
	090230027	Integrated optoelectronics	2	FA	O	O	
	090230028	Instrument and meter electronics	2	SP	O	O	
	090230029	Power system planning	2	SP	O	O	
	090230030	Biomedical measurement and instrument	2	FA	O	O	
	090230031	The design of embedded system	2	SP	O	O	
	090230032	Signal analysis and processing test	2	SP	O	O	
Other Requirements	<p>1. For courses selection, supervisors are required to provide necessary advice and suggestions; courses selected by postgraduates must be approved by the supervisor.</p> <p>2. Postgraduates must select at least 1 cross-disciplinary course, but the maximum credit they can earn is 4.</p> <p>3. PhDs under the program of Master-PhD are exempted from politics theory courses during their doctoral studies, but they are required to replenish the credit loss by taking other optional courses.</p> <p>4. PhDs enrolled from other majors or other colleges and universities must take the compulsory courses,</p>						



	among which candidates can apply for an exemption for courses which they have already completed with their school report card, and replace them with other courses.			
<b>Other Academic Sections (C-Compulsory; O-Optional)</b>				
Category	C or O	Credit	Requirements	Evaluation (Ways and time)
Academic Lectures	C	0.5	Masters shall attend at least 10 academic activities organized by the school or the university; PhDs shall attend at least 15 academic activities.	Candidates are required to write a report with about 800 characters for each activity they attend. The report shall cover the following elements: when, where, who (keynote speaker) and what (topic), and his/her own opinions about the topic, and the inspiration he/she gets from the academic activity.
Mid-term Assessment	C for PhDs	1	The assessment committee together with the candidate's supervisor will examine his/her doctoral study and test scores. Candidates' research ability is also considered. The thesis proposal is evaluated as well.	The mid-term assessment is usually held in the last month of the third semester, and PhDs are required to report to the assessment committee with a PPT. Those who get a "Pass" for the assessment are allowed enter into the thesis writing phase.
Literature Review and Research Report	C	0.5	Masters shall deliver at least 4 academic reports and/or progress reports on thesis writing to the supervisor's research team. PhDs shall deliver at least 6 academic reports and/or progress reports on thesis writing to the supervisor's research team. PhDs shall present a comprehensive report on the field they study and their thesis prior to the thesis defense.	The assessment shall be conducted by the supervisors committee and reported to the teaching secretary for the record.
Thesis Proposal	C	1	1. The thesis proposal shall include: the source of the subject, the purpose and the significance of the research, an analysis of the status quo of the research and its	1.The thesis proposal examination is usually organized in the third semester. 2. The examination committee is



			<p>development trend at home and abroad, main points of the thesis, research program and scheduling, expected results, and conditions and fund needed, potential obstacles and problems and solutions, and main references.</p> <p>2. The thesis proposal examination shall be organized publicly for candidates of the same program. Candidates shall submit before the examination the literature review to the examination committee for examination and approval. Candidates who change their thesis subject shall apply for the thesis proposal examination for the new subject on the condition that the change is warranted.</p> <p>3. Prior to the application for a thesis defense, candidates must take the thesis proposal examination. There must be at least one complete semester between the semester when the thesis proposal examination is held and the semester when the thesis defense is held.</p>	usually composed of 3-5 supervisors. If there involve cross-discipline subjects, experts from other disciplines shall be invited.
Social Practice	C for masters (1 out of the 2)	1	Under the guidance of the supervisor, candidates shall participate in scientific research training or engineering practice organized by the college, the institute, and/or the supervisor.	On the completion of the social practice and/or the teaching practice, candidates are required to fill out the Report on Social Practice of Postgraduates of Xiamen University. The report on social practice shall be examined and approved by the leading teacher with signature. The report on teaching practice shall be examined and approved by the supervisor with signature.
Teaching Practice			Candidates shall work as the teaching assistant to the supervisor. The teaching practice can be instructing exercises, correcting and marking assignments, and instructing undergraduates' graduation projects under the guidance of the supervisor. Accumulated work load shall be	



			at least 32 hours shall be no less than 32 hours.	The report shall be submitted to the college for the record. The practice counts 1 credit.
Inter-Campus Communication and Exchange	C for PhDs	1	PhDs shall attend more than 1 international academic conference.	It shall be evaluated by the supervisor team and the results shall be submitted to the teaching secretary for the record.
Thesis	<p>1. Under the guidance of the supervisor, the candidate shall complete the thesis writing independently.</p> <p>2. A systematic and complete thesis shall include: abstracts in Chinese and English, source of the subject, its development at home and abroad, theoretical analyses, experiments and calculations, research results, references, etc. The thesis shall be concise with a correct argument and reliable data. It shall be innovative in its theoretical analyses, computing methods, experiment techniques, devices, techniques, etc.</p> <p>3. Masters shall allocate at least 1 year for the thesis writing, and PhDs at least 2 years. The thesis shall display the candidate's ability in solving problems with relevant theories, methods, and technological methods, and the grasp of basic theories and specialize knowledge.</p> <p>4. The thesis defense. Prior to the thesis defense, candidates shall take the mock viva organized within the supervisor's research team and make corresponding revisions and improvements. The thesis defense shall be carried out according to the Regulations on Postgraduates' Degree Application and Thesis Defense of Xiamen University.</p>			
<b>Major References and Journals (C-Compulsory; O-Optional)</b>				
No.	Title	Author	Evaluation*	Remarks (C or O)
1	Physical Review Letters	APS	Examination	C
2	Laser Physics Letters	Wiley	Examination	C
3	IEEE Transactions on Pattern Analysis and Machine Intelligence	IEEE	Examination	C
4	Applied Physics Letters	AIP	Examination	C
5	IEEE Transactions on Medical Imaging	IEEE	Examination	C
6	International Journal of Computer Vision	Springer	Examination	C
7	Optics Express	OSA	Examination	C
8	Optics Letters	OSA	Examination	C
9	Physical Review A	APS	Examination	C
10	IEEE Transactions on Image Processing	IEEE	Examination	C



- Evaluation ways:
1. Examination: Knowledge of references and journals to be covered on the examination;
  2. Examination on thesis proposal or comprehensive examination;
  3. Reading Report;
  4. Other specific ways.