



Republic of the Philippines  
**BATANGAS STATE UNIVERSITY**  
The National Engineering University

**Lipa Campus**

A. Tanco Drive, Marawoy, Lipa City, Batangas, Philippines 4217

Tel Nos.: (+63 43) 980-0385; 980-0387; 980-0392 to 94 loc. 3129

E-mail Address: [cit.lipa@g.batstate-u.edu.ph](mailto:cit.lipa@g.batstate-u.edu.ph) | Website Address: <http://www.batstate-u.edu.ph>

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**Office of the College of Industrial Technology**

**CURRICULUM**

**Bachelor of Industrial Technology**

**INSTRUMENTATION AND CONTROL TECHNOLOGY**

Academic Year 2023-2024

Reference: CMO No. 20 S. 2013, CMO No. 4 S. 2018, CMO No. 39 S. 2021, CMO No. 40 S. 2021 and Based on PACUIT Proposal

**Curriculum Description**

The program in Bachelor of Industrial Technology Major in Instrumentation and Control Technology will prepare graduates with the technical and managerial skills necessary to enter careers in design, manufacturing, marketing, operations and maintenance in the field of measurement, control, robotics and automation technology. The program, as a result of extensive laboratory experience in components/device operation, calibration and interconnection, have strengths in their knowledge of operations, maintenance and manufacturing. Graduates are qualified to undertake the design and specification of control systems and for the subsequent management of their installation and operation.

**Program Objectives**

1. Successfully practice as engineering technologists for the welfare of the society.
2. Demonstrate a high degree of professionalism at all times.

**Institutional Graduate Attributes**

The student should achieve at least 75% for each IGA upon graduation.

- **Knowledge Competence.** Demonstrate a mastery of the fundamental knowledge and skills required for functioning effectively as a professional in the discipline, and an ability to integrate and apply them effectively to practice in the workplace.
- **Creativity and Innovation.** Experiment with new approaches, challenge existing knowledge boundaries and design novel solutions to solve problems.
- **Critical and Systems Thinking.** Identify, define, and deal with complex problems pertinent to the future professional practice or daily life through logical, analytical and critical thinking.
- **Communication.** Communicate effectively (both orally and in writing) with a wide range of audiences, across a range of professional and personal contexts, in English and Pilipino.
- **Lifelong Learning.** Identify own learning needs for professional or personal development; demonstrate an eagerness to take up opportunities for learning new things as well as the ability to learn effectively on their own.
- **Leadership, teamwork, and Interpersonal Skills.** Function effectively both as a leader and as a member of a team; motivate and lead a team to work towards goal; work collaboratively with other team members; as well as connect and interact socially and effectively with diverse culture.



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- **Global Outlook.** Demonstrate an awareness and understanding of global issues and willingness to work, interact effectively and show sensitivity to cultural diversity.
- **Social and National Responsibility.** Demonstrate an awareness of their social and national responsibility; engage in activities that contribute to the betterment of the society; and behave ethically and responsibly in social, professional and work environments.

### Program Outcomes

Graduates will have:

- An appropriate mastery of the knowledge, techniques, skills and modern tools of technology
- An ability to apply current knowledge and adapt to emerging applications of mathematics, science and technology
- An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes
- An ability to apply creativity in the design of systems, components or processes appropriate to program objectives
- An ability to function effectively on teams
- An ability to identify, analyze and solve technical problems
- An ability to communicate effectively in writing and in oral presentation
- A recognition of the need for, and an ability to engage in lifelong learning
- An ability to understand professional, ethical and social responsibilities
- The knowledge of and respect for diverse backgrounds, contemporary societal and global issues concerning the profession
- A commitment to quality, timeliness and continuous improvement

### Curriculum Components

Code	Courses	Units	Total
	<b>A. General Education Courses (CMO No. 20, series of 2013)</b>		<b>36 units</b>
	<b>B. Professional and Management Courses</b>		<b>32 units</b>
PM 101	Occupational Health and Safety Management	2	
PM 102	Industrial Operation & Management Practices	3	
PM 103	Production and Operations Management	3	
PM 104	Technology Research I	3	
PM 105	Materials Technology Management	3	
PM 106	Professional Ethics	3	
PM 107	Technology Research II	3	
PM 108	Manufacturing Technology	3	
PM 109	Total Quality Management	3	
PM 110	Environmental Technology	3	
ENGG 405	Technopreneurship	3	



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<b>C. Applied Sciences and Tools Courses</b>			<b>28 units</b>
AST 111	Math for Technology	3	
AST 102	Applied Chemistry	3	
AST 105	Applied Physics	3	
AST 133	Production Drawing	2	
AST 113	Electrical and Electronics Principles	3	
AST 135	Computer Aided Design	2	
AST 134	Computer Programming	3	
AST 121	Hydraulics and Pneumatics Systems	3	
AST 110	Data Analytics	3	
AST 116	Electrical Motors and Control	3	
<b>D. Major Specialization Courses</b>			<b>36 units</b>
ICT 111	Process Variable Measurement I	3	
ICT 121	Process Variable Measurement II	3	
ICT 211	Instrumentation System Diagram and Process Equipment	3	
ICT 212	Digital Electronics and Microprocessor	3	
ICT 221	Electropneumatic and Electrohydraulic Systems	3	
ICT 222	Workshop Technology	3	
ICT 223	Analytical Instrumentation	3	
ICT 311	Industrial Process Control	3	
CPT 322	Plant Safety Network	3	
ICT 312	Instrumentation PLC 1	3	
ICT 321	Instrumentation PLC 2	3	
ICT 322	Process Control Applications	3	
<b>E. Mandated Courses</b>			<b>14 units</b>
PATHFit 1	Movement Competency Training	2	
PATHFit 2	Exercise-Based Fitness Activities	2	
PATHFit 3	Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor & Adventure Activities Menu Offering: Traditional and Recreational Games	2	
PATHFit 4	Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor & Adventure Activities Menu Offering: Team Sports (Basketball and Volleyball)	2	
NSTP 111	National Service Training Program 1	3	
NSTP 121	National Service Training Program 2	3	
<b>F. Supervised Industrial Training/OJT</b>			<b>20 units</b>



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SUMMARY	
Courses	Number of Units
General Education	36
Applied Sciences and Tool Courses	28
Professional and Management Courses	32
Specialization/Major Courses	36
Supervised Industrial Training/OJT	20
Mandated Courses (PATHFit 1-4 & NSTP)	14
<b>TOTAL</b>	<b>166</b>

**PROGRAM OF STUDY**

FIRST YEAR						
First Semester						
COURSE NO.	COURSE TITLE	CREDIT		UNITS	NO. OF HRS.	PRE-REQUISITE
		LEC	LB/SW			
AST 111	Math for Technology	3	0	3	3	None
AST 102	Applied Chemistry	2	3	3	5	None
AST 105	Applied Physics	2	3	3	5	None
AST 133	Production Drawing	1	3	2	4	None
PM 101	Occupational Health and Safety Management	2	0	2	2	None
ICT 111	Process Variable Measurement I	2	3	3	5	None
NSTP 111	National Service Training Program 1	3	0	3	3	None
PATHFit 1	Movement Competency Training	2	0	2	2	None
	<b>TOTAL</b>	<b>15</b>	<b>12</b>	<b>21</b>	<b>24</b>	
FIRST YEAR						
Second Semester						
COURSE NO.	COURSE TITLE	CREDIT		UNITS	NO. OF HRS.	PRE-REQUISITE
		LEC	LB/SW			
GEEd 101	Understanding the Self	3	0	3	3	None
GEEd 102	Mathematics in the Modern World	3	0	3	3	None
GEEd 106	Purposive Communication	3	0	3	3	None
GEEd 109	Science, Technology and Society	3	0	3	3	None
AST 113	Electrical and Electronics Principles	2	3	3	5	AST 105
AST 135	Computer Aided Design	1	3	2	4	AST 133
ICT 121	Process Variable Measurement II	2	3	3	5	ICT 111
NSTP 121	National Service Training Program 2	3	0	3	3	NSTP 111
PATHFit 2	Exercise-Based Fitness Activities	2	0	2	2	PATHFit 1
	<b>TOTAL</b>	<b>20</b>	<b>9</b>	<b>25</b>	<b>26</b>	



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<b>SECOND YEAR</b>						
<b>First Semester</b>						
COURSE NO.	COURSE TITLE	CREDIT		UNITS	NO. OF HRS.	PRE-REQUISITE
		LEC	LB/SW			
GEd 103	The Life and Works of Rizal	3	0	3	3	None
GEd 104	The Contemporary World	3	0	3	3	None
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	0	3	3	None
PM 102	Industrial Operation & Management Practices	3	0	3	3	None
AST 134	Computer Programming	2	3	3	5	None
AST 121	Hydraulics and Pneumatics Systems	2	3	3	5	AST 105
ICT 211	Instrumentation System Diagram and Process Equipment	1	6	3	7	ICT 121
ICT 212	Digital Electronics and Microprocessor	2	3	3	5	AST 113
PATHFit 3	Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor & Adventure Activities Menu Offering: Traditional and Recreational Games	2	0	2	2	PATHFit 1 and PATHFit 2
<b>TOTAL</b>		<b>21</b>	<b>15</b>	<b>26</b>	<b>36</b>	
<b>SECOND YEAR</b>						
<b>Second Semester</b>						
COURSE NO.	COURSE TITLE	CREDIT		UNITS	NO. OF HRS.	PRE-REQUISITE
		LEC	LB/SW			
Fili 102	Filipino sa iba't ibang Disiplina	3	0	3	3	None
GEd 107	Ethics	3	0	3	3	None
PM 103	Production and Operations Management	3	0	3	3	
AST 110	Data Analytics	3	0	3	3	GEd 102, AST 111
AST 116	Electrical Motors and Control	2	3	3	5	AST 113
ICT 221	Electropneumatic and Electrohydraulic Systems	2	3	3	5	ICT 212
ICT 222	Workshop Technology	2	3	3	5	ICT 211, ICT 212
ICT 223	Analytical Instrumentation	2	3	3	5	AST 102, ICT 211
PATHFit 4	Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor & Adventure Activities Menu Offering: Team Sports (Basketball and Volleyball)	2	0	2	2	PATHFit 1 and PATHFit 2
<b>TOTAL</b>		<b>22</b>	<b>12</b>	<b>26</b>	<b>34</b>	



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<b>THIRD YEAR</b>						
<b>First Semester</b>						
<b>COURSE NO.</b>	<b>COURSE TITLE</b>	<b>CREDIT</b>		<b>THIRD YEAR</b>	<b>NO. OF HRS.</b>	<b>PRE-REQUISITE</b>
		<b>LEC</b>	<b>LB/SW</b>			
Litr 102	ASEAN Literature	3	0	3	3	None
GEEd 105	Readings in Philippine History	3	0	3	3	None
PM 104	Technology Research I	3	0	3	3	ICT 221, ICT 222, ICT 223
PM 105	Materials Technology Management	3	0	3	3	ICT 221, ICT 222, ICT 223
PM 106	Professional Ethics	3	0	3	3	GEEd 107
ICT 311	Industrial Process Control	2	3	3	5	ICT 221, ICT 222, ICT 223
CPT 322	Plant Safety Network	2	3	3	5	ICT 221, ICT 222, ICT 223
ICT 312	Instrumentation PLC I	2	3	3	5	ICT 221, ICT 222, ICT 223
	<b>TOTAL</b>	<b>21</b>	<b>9</b>	<b>24</b>	<b>30</b>	
<b>THIRD YEAR</b>						
<b>Second Semester</b>						
<b>COURSE NO.</b>	<b>COURSE TITLE</b>	<b>CREDIT</b>		<b>UNITS</b>	<b>NO. OF HRS.</b>	<b>PRE-REQUISITE</b>
		<b>LEC</b>	<b>LB/SW</b>			
GEEd 108	Art Appreciation	3	0	3	3	None
PM 107	Technology Research II	3	0	3	3	*Regular Standing
PM 108	Manufacturing Technology	3	0	3	3	*Regular Standing
PM 109	Total Quality Management	3	0	3	3	*Regular Standing
PM 110	Environmental Technology	3	0	3	3	*Regular Standing
ENGG 405	Technopreneurship	3	0	3	3	*Regular Standing
ICT 321	Instrumentation PLC II	2	3	3	5	ICT 312
ICT 322	Process Control Applications	2	3	3	5	ICT 311
	<b>TOTAL</b>	<b>22</b>	<b>6</b>	<b>24</b>	<b>28</b>	



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<b>FOURTH YEAR</b>						
<b>First Semester</b>						
<b>COURSE NO.</b>	<b>COURSE TITLE</b>	<b>CREDIT</b>		<b>UNITS</b>	<b>NO. OF HRS.</b>	<b>PRE-REQUISITE</b>
		<b>LEC</b>	<b>LB/SW</b>			
OJT 105	Supervised Industrial Training 1 (540hrs)	0	10	10	540	ICT 321, ICT 322
	<b>TOTAL</b>			<b>10</b>	<b>540</b>	
<b>FOURTH YEAR</b>						
<b>Second Semester</b>						
<b>COURSE NO.</b>	<b>COURSE TITLE</b>	<b>CREDIT</b>		<b>UNITS</b>	<b>NO. OF HRS.</b>	<b>PRE-REQUISITE</b>
		<b>LEC</b>	<b>LB/SW</b>			
OJT 106	Supervised Industrial Training 2 (540hrs)	0	10	10	540	OJT 105
	<b>TOTAL</b>			<b>10</b>	<b>540</b>	

\* Regular Standing: No deficiencies on the previous semester.

**TOTAL UNITS:166**