

**PRODUCTION AND INDUSTRIAL  
ENGINEERING**

**Courses/Credit Distribution of Production and Industrial Engineering Department****I. Basic Science Courses (BSC)**

<b>Semester I</b>					
<b>Course code</b>	<b>Course name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
PYN105	Mechanics	3	1	0	4
<b>Semester II</b>					
<b>Course code</b>	<b>Course name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
MAN 103	Probability and Statistics	3	1	0	4
CHN 101	Applied Chemistry	3	0	3	4

**II. Engineering Science Courses (ESC)**

<b>Semester II</b>					
<b>Course code</b>	<b>Course name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
ESC101	Engineering Drawing	2	0	4	4
<b>Semester III</b>					
<b>Course code</b>	<b>Course name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
ESC204	Solid Mechanics	3	1	0	4
<b>Semester IV</b>					
XXXXXX	Fluid Mechanics	3	0	2	4

**III. Departmental Core Courses (DCC)**

<b>Course code</b>	<b>Course name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
PEN101	Introduction to Production and Industrial Engineering	2	0	0	2
PEN 102	Introduction to Manufacturing	2	0	4	4
PEN 103	Machining Technology	3	1	0	4
PEN 201	Kinematics & Dynamics	3	0	2	4
PEN 202	Industrial Metrology	3	0	2	4
PEN 203	Metallurgy and casting technology	3	0	2	4
PEN 204	Machine Drawing	2	0	4	4
PEN205	Technical Communication	2	0	0	2
PEN206	Engineering Analysis and Design	3	1	0	4
PEN 207	Forming and Welding	3	0	2	4
PEN 208	Design of Machine Elements	3	1	0	4
PEN 209	Tool Design	2	0	4	4
PEN 210	Industrial Engineering I	3	0	2	4
PEN 301	Computer Integrated Manufacturing	3	1	0	4
PEN 302	CNC Machines & Programming	3	0	2	4
PEN 303	Operations Research	3	1	0	4
PEN 304	Production and Operations Management	3	1	0	4
PEN 305	Industrial Engineering II	3	0	2	4

**IV. Departmental Elective courses (DEC)****Group-I (Any One)**

<b>Course code</b>	<b>Course name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
PEN 401	Thermal Engineering	3	1	0	4
PEN 402	Designing for automation	3	1	0	4
PEN 403	Smart Materials	3	1	0	4
PEN 404	Rapid Prototyping	3	1	0	4

**Group-2 (Any Two)**

<b>Course code</b>	<b>Course name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
PEN 411	Modern Manufacturing	3	0	2	4
PEN 412	Machine Tool Design	3	1	0	4
PEN 413	Robotics	3	1	0	4

PEN 414	Theory of Metal Cutting	3	1	0	4
PEN 415	Concurrent Engineering	3	1	2	4
IDN 521	Product Design and Development	3	1	0	4

**V. Open Elective Course**

Course code	Course name	L	T	P	Credits
PEN 461	Technology Management	3	1	0	4
PEN 462	Total Quality Management	3	0	2	4
PEN 303	Operations Research	3	1	0	4

**VI. Departmental Honors Courses (DHC)**

Course code	Course name	L	T	P	Credits
PEN 421	Advance Welding Technology	3	1	0	4
PEN 422	Advance Casting Technology	3	1	0	4
PEN 423	Maintenance and Reliability	3	1	0	4
PEN 555	Finite Element Analysis	3	1	0	4
IDN 522	Applied Ergonomics	3	1	0	4

**VII. Minor Specialization Courses (MSC)**

Course code	Course name	L	T	P	Credits
PEN 103	Machining Technology	3	1	0	4
PEN 210	Industrial Engineering I	3	1	0	4
PEN 301	Computer Integrated Manufacturing	3	1	0	4
PEN 305	Industrial Engineering II	3	1	0	4

## TEACHING SCHEME FOR B.E. PRODUCTION AND INDUSTRIAL ENGINEERING

### FIRST YEAR

#### Semester I

Course code	Subject	Credits	Category
MAN101	Mathematics-I	4	BSC
PEN101	Introduction to Industrial and Production Engineering	2	DCC
CSN104/ 105	Computer Programming (Basic/ Advanced)	4	ESC
PYN105	Mechanics	4	BCS
HSS101	Ethics and Self Awareness	2	HSSC
GSC101	Introduction to Environmental Science	3	GSC
	<b>Total</b>	<b>19</b>	

#### Semester II

Course code	Subject	Credits	Category
MAN103	Probability and Statistics	4	BSC
HSS102/ 103	Communication skills (Basic/ Advanced)	2	HSSC
CHN101	Applied Chemistry	4	BSC
ESC101	Engineering Drawing	4	ESC
PEN102	Introduction To Manufacturing	4	DCC
PEN103	Machining Technology	4	DCC
	<b>Total</b>	<b>22</b>	

### SECOND YEAR

#### Semester I

Course code	Subject	Credits	Category
ESC204	Solid Mechanics	4	ESC
PEN201	Kinematics & Dynamics	4	DCC
PEN202	Industrial Metrology	4	DCC
PEN203	Metallurgy and casting technology	4	DCC
PEN204	Machine Drawing	4	DCC
	Economics	3	HSSMEC
PEN205	Technical Communication	2	DCC
	<b>Total</b>	<b>25</b>	

#### Semester II

Course code	Subject	Credits	Category
PEN206	Engineering Analysis and Design	4	DCC
ESC	Fluid Mechanics	4	ESC
PEN207	Forming and Welding	4	DCC
PEN208	Design of Machine Elements	4	DCC
PEN209	Tool Design	4	DCC
PEN210	Industrial Engineering I	4	DCC
PEN221	Educational Tour	Non credit	DCC
	<b>Total</b>	<b>24</b>	

### THIRD YEAR

#### Semester I

Course code	Subject	Credits	Category
PEN301	Computer Integrated Design and Manufacturing	4	DCC
PEN302	CNC Machines & Programming	4	DCC
PEN303	Operations Research	4	DCC
PEN304	Production and Operations Management	4	DCC
PEN305	Industrial Engineering II	4	DCC
PEN321	Minor Project	4	DCC
	<b>Total</b>	<b>24</b>	

#### Semester II

Course code	Subject	Credits	Category
PEN331	Internship*	20	DCC
	<b>Total</b>	<b>20</b>	

\*Internship Seminar presentations may be held a week before the date of Registration in Semester-I of Fourth Year

### FOURTH YEAR

#### Semester I

Course code	Subject	Credits	Category
	Open Elective	4	GSEC/MEC
	Departmental Elective Course-I	4	DEC
	Departmental Elective Course-II	4	DEC
PEN441	Major Project-I	2*	DCC
	Departmental Honors Course-I	4	DHC
	Departmental Honors Course-II	4	DHC
	<b>Total</b>	<b>14/22</b>	

\*Evaluation needs to be carried out in next semester

#### Semester II

Course code	Subject	Credits	Category
HSM 404	Financial Management	3	HSSMEC
	Departmental Elective Course- III	4	DEC
PEN451	Major Project-II	6	DCC
	Departmental Honors Course-III	4	DHC
	Departmental Honors Course-IV	4	DHC
	Departmental Honors Course-V	4	DHC
	<b>Total</b>	<b>13/25</b>	<b>DHC</b>

**COURSES OFFERED BY APPLIED SCIENCE DEPARTMENT TO ALL DEPARTMENTS**

**I. Departmental Elective courses (DEC)**

**Group-I**

Course code	Course name	L	T	P	Credits
CHN 401	Modern Instrumental Methods Of Chemical Analysis	3	1	0	4
PYN 401	Advanced Physics	3	1	0	4
PYN 402	Crystal Physics	3	1	0	4
PYN 403	Solid State Physics	3	1	0	4
MAN 401	Operation Research	3	1	0	4
MAN 402	Optimization Techniques	3	1	0	4

**II. Minor Specialization Courses For 7<sup>th</sup> Semester**

Course Code	Course Name	L	T	P	Credits
<b>Humanities Section</b>					
HSM 401	Principles of Management	2	2	0	4
HSM 402	Business Environment and Business Laws	2	2	0	4
HSM 431	Managing Innovation and Change	2	2	0	4
<b>Chemistry Section</b>					
CHN 431	Inorganic Chemistry	3	0	3	4
CHN 432	Organic Chemistry	3	0	3	4
<b>Physics Section</b>					
PYN 431	Quantum Mechanics	3	1	0	4
PYN 432	Statistical Physics	3	1	0	4
<b>Mathematics Section</b>					
MAN 431	Algebra	3	1	0	4
MAN 432	Number Theory	3	1	0	4

**Minor Specialization Courses For 8<sup>th</sup> Semester**

Course Code	Course Name	L	T	P	Credits
<b>Humanities Section</b>					
HSM 404	Financial Management	2	2	0	4
HSM 405	Marketing Management	2	2	0	4
HSM 406	Human Resource Management	2	2	0	4
HSM 432	Business Research	2	2	0	4
<b>Chemistry Section</b>					
CHN 433	Physical Chemistry / Analytical Chemistry	3	1	0	4
CHN 434	Environmental Chemistry	3	1	0	4
CHN 435	Recent Advances in Chemical Sciences	3	1	0	4
<b>Physics Section</b>					
PYN 433	Nuclear Physics	3	1	0	4
PYN 434	Experimental Nuclear Physics	3	1	0	4
PYN 435	X-Ray Crystallography	3	1	0	4
<b>Mathematics Section</b>					
MAN 433	Fourier Series and Integral Transforms	3	1	0	4
MAN 434	Calculus of Variations	3	1	0	4
MAN 435	Algebraic Coding Theory	3	1	0	4