



**AMET**  
ACADEMY OF MARITIME EDUCATION AND TRAINING  
DEEMED TO BE UNIVERSITY  
(Under Section 3 of UGC Act 1956)

**DEPARTMENT OF NAVAL ARCHITECTURE AND  
OFFSHORE ENGINEERING**

**CURRICULUM 2021-22**

(Applicable to all students registering from the academic year 2021-22 onwards)

**B.E. in NAVAL ARCHITECTURE AND OFFSHORE ENGINEERING**

## **DEPARTMENT OF NAVAL ARCHITECTURE AND OFFSHORE ENGINEERING**

### **Vision and Mission of the Institution**

#### **Vision**

To sustain identity as a World Class Leader in Maritime Education and empower learners with wholesome knowledge through progressive innovation in training, research and development which will render students a unique learning experience and a transformation impact on the Global Society.

#### **Mission**

AMET will strive continuously to

- ❖ Impart value-based higher education and technical knowledge with uncompromising strides of an outstanding quality.
- ❖ Emerge as a Centre of Excellence inculcating skill development in recent technologies in accordance with industrial trends.
- ❖ Create World class research capabilities on par with the finest in the world and broaden student's horizons beyond classroom education.
- ❖ Nurture talent and entrepreneurship to enable all round personality development among students.
- ❖ Empower students across socio economic strata
- ❖ Make a positive difference to society through technical education.

### **Vision and Mission of the Department**

#### **Vision**

Our aim is to bring in education and research of highest International standards to bring the young minds academically intelligent, technically creative, ethically sound, emotionally strong and valuable to society.

#### **Mission**

- The Department is committed to impart high quality education and research in maritime sector.
- The Department is focused on adopting the method of “learn by practice” that help the students to apply the knowledge on innovations.

- The Department is committed to improve the analytical and numerical skill of the students to enrich them in innovation and research.
- To undertake various projects to support the design and research activities helping the graduates in career development and higher studies.
- To create the world class research capabilities in the fields of Naval architecture and offshore engineering.
- To make a positive difference to the discipline of Naval architecture through hands-on based education.

### **Program Educational Objectives(PEO's)**

The Program Educational Objective of the Bachelor of Naval Architecture & Offshore Engineering is to enable the students to:

**PEO1:** Build their career as a successful and distinguished Naval Architect or Offshore Engineer.

**PEO2** Pursue higher education and research in marine sector, other engineering streams and specializations.

**PEO3** Acquire innovative and creative thinking skills to augment their professional growth.

**PEO4** Develop high moral values, positive attitude and societal responsibilities.

### **Program Outcomes (PO's)**

<b>POs</b>	<b>Description</b>
<b>PO1</b>	<b>Engineering knowledge:</b> Apply knowledge of mathematics, science and engineering in their specialization involving complex engineering problems.
<b>PO2</b>	<b>Problem Analysis:</b> Analyze a problem, identify, formulate and solve engineering problems using basic fundamental principles of mathematics and science.
<b>PO3</b>	<b>Design/Development of solutions:</b> Design a system component or process to meet the desired needs and standards within realistic constraints such as public health and safety, social and environmental considerations.
<b>PO4</b>	<b>Conduct investigations of complex problems:</b> Design and conduct experiments, as well as do research, analyze and interpret data and give clear solutions.
<b>PO5</b>	<b>Modern tool usage:</b> Use and learn the limitations involved in recent techniques,

	skills and modern engineering tools necessary for engineering practice.
<b>PO6</b>	<b>The Engineer and Society:</b> Assess the local and global impact of engineering solutions on individuals, organization and society and the consequent responsibilities relevant to their professional engineering practice.
<b>PO7</b>	<b>Environment and Sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
<b>PO8</b>	<b>Ethics:</b> Understand the professional and ethical responsibilities and norms of engineering practice.
<b>PO9</b>	<b>Individual and team work:</b> Work with multi-disciplinary teams, involve in team activities and accomplish a common goal.
<b>PO10</b>	<b>Communication:</b> Communicate effectively with engineering community for presentation, documentation of reports adopting the design standards.
<b>PO11</b>	<b>Project Management and Finance:</b> Understand engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.
<b>PO12</b>	<b>Life-long learning:</b> Meet contemporary issues and create advance technologies and will be engaged to life long learning in the broadest scale.

### Program Specific Outcomes (PSOs)

<b>PSOs</b>	<b>Description</b>
<b>PSO1</b>	Develop innovative designs to augment the ship building industry using gained knowledge in the field of design and materials for meeting the challenges offered by the marine industries.
<b>PSO2</b>	Graduate engineers are able to role-play in the field of naval architecture and offshore engineering to meet the man power requirement globally.
<b>PSO3</b>	Achieve highest level of scientific competence to excel in advanced research activities on multi-disciplinary domain at world class facilities and organizations

**PEO / PO Mapping:**

<b>PROGRAM EDUCATIONAL OBJECTIVES</b>	<b>PROGRAM OUTCOMES</b>											
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
<b>PEO1</b>	√	√	√	√	√	√		√	√	√	√	√
<b>PEO2</b>	√	√	√	√	√	√		√	√	√	√	√
<b>PEO3</b>	√	√	√	√		√	√	√	√		√	
<b>PEO4</b>						√	√	√	√	√	√	√



**CBCS CURRICULUM-2021-22**  
**DEPARTMENT OF NAVAL ARCHITECTURE AND OFFSHORE**  
**ENGINEERING**

**CURRICULUM 2021-22**

**SEMESTER: I**

S. N	Course Code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UELEC01	Humanities and Social Sciences including Management	Technical English	2	2	0	0	2
2	UEPHC01	Basic Science Course	Engineering Physics I	3	3	0	0	3
3	UEMTC01	Basic Science Course	Engineering Mathematics I	4	3	1	0	4
4	UECHC01	Basic Science Courses	Engineering Chemistry	4	4	0	0	4
5	UEMDC01	Mandatory Course	Universal Human Values I -Induction program	3 weeks	-	-	-	-
<b>PRACTICAL</b>								
6	UELECPA	Humanities and Social Sciences including Management	Communication Skills Laboratory I	2	0	0	2	1
7	UEPHCPA	Basic Science Course	Engineering Physics Laboratory	2	0	0	2	1
8	UECHCPA	Basic Science Courses	Engineering Chemistry Laboratory	2	0	0	2	1
9	UEWSCPA	Engineering Science Course	Workshop Practices	4	0	0	4	2
<b>TOTAL</b>				<b>23</b>	<b>12</b>	<b>1</b>	<b>10</b>	<b>18</b>

**Note: L - Lecture T- Tutorial P- Practical C – Credit**



**CBCS CURRICULUM-2021-22**  
**SEMESTER: II**

S. N	Course Code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEPHC02	Basic Science Course	Engineering Physics II	2	2	0	0	2
2	UEMTC02	Basic Science Course	Engineering Mathematics II	4	3	1	0	4
3	UEEEEC01	Engineering Science Course	Basic Electrical Engineering	4	3	1	0	4
4	UEMCC01	Engineering Science Course	Engineering Mechanics	3	3	0	0	3
5	UEITC01	Engineering Science Course	Python for Problem Solving	3	3	0	0	3
6	UEMDC02	Mandatory Course	Environmental Science	2	2	0	0	0
7	UEMDC03	Humanities and Social Sciences	Gender sensitivity	2	2	-	-	-
<b>PRACTICAL</b>								
8	UELECPB	Humanities and Social Sciences including Management	Communication Skills Laboratory II	2	0	0	2	1
9	UEEECPA	Engineering Science Course	Basic Electrical Engineering Laboratory	2	0	0	2	1
10	UEITCPA	Engineering Science Course	Python Programming Laboratory	2	0	0	2	1
11	UEMCCPA	Engineering Science Course	Engineering Graphics and Design	5	1	0	4	3
<b>TOTAL</b>				<b>31</b>	<b>19</b>	<b>2</b>	<b>10</b>	<b>22</b>

**Note: L - Lecture T- Tutorial P- Practical C – Credit**



**CBCS CURRICULUM-2021-22**  
**SEMESTER: III**

S.N	Course Code	Category	Subject title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEMTC03	Basic Science Course	Engineering Mathematics – III	4	3	1	0	4
2	UENA301	Engineering Science Course	Engineering Fluid Mechanics	3	3	0	0	3
3	UENA302	Engineering Science Course	Mechanics of Materials	3	3	0	0	3
4	UENA303	Professional Core Course	Introduction to Naval Architecture	3	3	0	0	3
5	UENA304	Professional Core Course	Marine Materials and Welding Technology	3	3	0	0	3
6	UENA305	Professional Core Course	Elements of Offshore Engineering	3	3	0	0	3
7	UEMDC04	Mandatory Course	Constitution of India	2	2	0	0	0
8	UEVCC01	Employment Opportunity Course	Value Added Training Program - 1	-	-	-	-	-
9	UEVCC02	Industrial Visit	Industrial Visit - I	-	-	-	-	-
<b>PRACTICAL</b>								
10	UELECPC	Humanities and Social Sciences including Management	Interpersonal Communication	2	0	0	2	1
11	UENA3PA	Engineering Science Course	Strength of Materials Lab	2	0	0	2	1
12	UENA3PB	Engineering Science Course	Electrical Workshop	2	0	0	2	1
13	UENA3PC	Professional Lab	Ship Drawing - Lines Plan	3	0	0	3	2
<b>TOTAL</b>				<b>30</b>	<b>20</b>	<b>01</b>	<b>09</b>	<b>24</b>

**Note: L - Lecture T- Tutorial P- Practical C – Credit**





**CBCS CURRICULUM-2021-22**  
**SEMESTER: IV**

S.N	Course Code	Category	Subject title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEMDC05	Humanities And Social Sciences including Management	Universal Human Values –II- Understanding Harmony	3	3	0	0	3
2	UEMTC04	Basic Science Course	Mathematical Foundation for Data Science and Artificial Intelligence	2	1	1	0	2
3	UENA401	Professional Core Course	Thermodynamics & Marine Machinery	3	3	0	0	3
4	UENA402	Professional Core Course	Marine Production Technology	3	3	0	0	3
5	UENA403	Professional Core Course	Marine Hydrodynamics	3	2	1	0	3
6	UENA404	Professional Core Course	Theory of Ships	3	2	1	0	3
7		Open Elective Course	OEC - I	3	3	0	0	3
8	UEMDC05	Mandatory Course	Essence of Indian Knowledge Tradition	2	2	0	0	0
9	UEVCC03	Employment Opportunity course	Value Added Training Program - II	-	-	-	-	-
10	UEVCC04	Industrial Visit	Industrial Visit - II	-	-	-	-	-
<b>PRACTICAL</b>								
11	UELECPD	Humanities And Social Sciences including Management	Professional Communication	2	0	0	2	1
12	UENA4PA	Professional Lab	Hydrostatics & Stability Laboratory	2	0	0	2	1
13	UENA4PB	Professional Lab	Surface Modelling and Analysis - Software Laboratory	2	0	0	2	1
<b>TOTAL</b>				<b>28</b>	<b>19</b>	<b>03</b>	<b>06</b>	<b>23</b>

**Note: C- Credit L- Lecture T- Tutorial P – Practical**



**CBCS CURRICULUM-2021-22**  
**SEMESTER: V**

S.N	Course Code	Category	Subject title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UENA501	Humanities And Social Sciences including Management	Project Management	2	2	0	0	2
2	UEITC02	Engineering Science Course	Data Science	3	3	0	0	3
3	UENA502	Professional Core Course	Strength of Ships	3	2	1	0	3
4	UENA503	Professional Core Course	Ship Resistance and Propulsion	3	2	1	0	3
5		Professional Core elective	PEC - I	3	3	0	0	3
6		Open Elective Course	OEC - II	3	3	0	0	3
7	UEVCC05	Employment Opportunity course	Value Added Training Program - III	-	-	-	-	-
8	UEVCC06	Industrial Visit	Industrial Visit - III	-	-	-	-	-
<b>PRACTICAL</b>								
9	UENA5PA	Professional Lab	Ship Strength Laboratory	2	0	0	2	1
10	UENA5PB	Professional Lab	Structural Modelling - Software Laboratory	2	0	0	2	1
11	UENA5PC	PROJ	Internship – I	0	0	0	0	1
<b>TOTAL</b>				<b>21</b>	<b>15</b>	<b>02</b>	<b>04</b>	<b>20</b>

**Note: C- Credit L- Lecture T- Tutorial P – Practical**



**CBCS CURRICULUM-2021-22**  
**SEMESTER: VI**

S.N	Course Code	Category	Subject title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEITC03	Engineering Science	Artificial Intelligence	3	3	0	0	3
2	UENA601	Professional Core Course	Design of Offshore Structures/	3	3	0	0	3
3	UENA602	Professional Core Course	Ship Motion and Control	3	2	1	0	3
4	UENA603	Professional Core Course	Ship Design	3	2	1	0	3
5		Professional Core elective	PEC - II	3	3	0	0	3
6		Professional Core elective	PEC - III	3	3	0	0	3
7		Open Elective Course	OEC - III	3	3	0	0	3
8	UEVCC07	Employment Opportunity course	Finishing School Training - I	-	-	-	-	-
9	UEVCC08	Employment Opportunity course	Value Added Training Program - IV	-	-	-	-	-
10	UEVCC09	Industrial Visit	Industrial Visit - IV	-	-	-	-	-
<b>PRACTICAL</b>								
11	UENA6PA	Professional Lab	Marine Hydrodynamics Laboratory	2	0	0	2	1
12	UENA6PB	Professional Lab	Offshore Structure Design - Software Laboratory	2	0	0	2	1
13	UENA6PC	Professional Lab	Seamanship Lab	2	0	0	2	1
<b>TOTAL</b>				<b>27</b>	<b>19</b>	<b>02</b>	<b>06</b>	<b>24</b>

**Note: C- Credit    L- Lecture    T- Tutorial    P – Practical**



**CBCS CURRICULUM-2021-22**  
**SEMESTER: VII**

S.N	Course Code	Category	Subject title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UENA701	Professional Core Course	Advanced Ship Technology	3	3	0	0	3
2		Professional Core elective	PEC - IV	3	3	0	0	3
3		Professional Core elective	PEC - V	3	3	0	0	3
4		Professional Core elective	PEC - VI	3	3	0	0	3
5		Open Elective Course	OEC - IV	3	3	0	0	3
6	UEVCC10	Employment Opportunity course	Finishing School Training - II	-	-	-	-	-
7	UEVCC11	Employment Opportunity course	Value Added Training Program - V	-	-	-	-	-
8	UEVCC12	Industrial Visit	Industrial Visit - V	-	-	-	-	-
<b>PRACTICAL</b>								
9	UENA7PA	Professional Lab	Ship System Drawing & Launching Calculations Laboratory	2	0	0	2	1
10	UENA7PB	Professional Lab	Numerical Ship Hydrodynamics – Software Laboratory	2	0	0	2	1
11	UENA7PC	PROJ	Ship Design Project	8	0	0	8	4
12	UENA7PD	PROJ	Internship - II	0	0	0	0	1
<b>TOTAL</b>				<b>27</b>	<b>15</b>	<b>0</b>	<b>12</b>	<b>22</b>

**Note: C- Credit    L- Lecture    T- Tutorial    P – Practical**



**AMET**  
ACADEMY OF MARITIME EDUCATION AND TRAINING  
DEEMED TO BE UNIVERSITY  
(Under Section 3 of UGC Act 1956)

**CBCS CURRICULUM-2021-22**  
**SEMESTER: VIII**

S.No.	Course Code	Category	Subject title	Contact Hours	L	T	P	C
1	UENA8PA	PROJ	Major Project / Industry Internship Project	20	-	-	20	10
<b>TOTAL</b>				<b>20</b>	<b>-</b>	<b>-</b>	<b>20</b>	<b>10</b>



**List of professional elective courses (PEC) offered by the Department**

Sl. No.	Course code	Title of the PEC	Contact Hours	L	T	P	C
<b>PEC1-V</b>							
1	UENAE01	Numerical Analysis and Programming	3	3	0	0	3
2	UENAE02	Advanced Wave Mechanics	3	3	0	0	3
3	UENAE03	Lifting Surfaces for Marine Applications	3	3	0	0	3
4	UENAE04	Marine Engineering-I	3	3	0	0	3
5	UENAE05	Ocean Data Analysis	3	3	0	0	3
6	UENAE06	SWAYAM / MOOCs Course	3	3	0	0	3
<b>PEC2-VI</b>							
1	UENAE07	CAD/CAM in Ship Building	3	3	0	0	3
2	UENAE08	Advanced Offshore Engineering	3	3	0	0	3
3	UENAE09	Fishing Vessel Technology	3	3	0	0	3
4	UENAE10	Statutory Regulations and Classification Rules	3	3	0	0	3
5	UENAE11	Dredging Technology	3	3	0	0	3
6	UENAE12	SWAYAM / MOOCs Course	3	3	0	0	3
<b>PEC3-VI</b>							
1	UENAE13	Inland Water Transportation	3	3	0	0	3
2	UENAE14	Fluid Structure Interaction	3	3	0	0	3
3	UENAE15	Ship Systems Engineering	3	3	0	0	3
4	UENAE16	Marine Engineering-II	3	3	0	0	3
5	UENAE17	Marine Instrumentation	3	3	0	0	3
6	UENAE18	SWAYAM / MOOCs Course	3	3	0	0	3
<b>PEC4-VII</b>							
1	UENAE19	Advanced Ship Design	3	3	0	0	3



**CBCS CURRICULUM-2021-22**

2	UENAE20	Computer Aided Structural Design (FEA)	3	3	0	0	3
3	UENAE21	Subsea Pipeline and Risers	3	3	0	0	3
4	UENAE22	Dynamics of Offshore Structures	3	3	0	0	3
5	UENAE23	Integrated Coastal Zone Management	3	3	0	0	3
6	UENAE24	SWAYAM / MOOCs Course	3	3	0	0	3
<b>PEC5-VII</b>							
1	UENAE25	Vibration of Floating Structures	3	3	0	0	3
2	UENAE26	High Performance Marine Vehicles	3	3	0	0	3
3	UENAE27	Marine Corrosion and Control	3	3	0	0	3
4	UENAE28	Theory and Practice in Marine CFD	3	3	0	0	3
5	UENAE29	Port Planning	3	3	0	0	3
6	UENAE30	SWAYAM / MOOCs Course	3	3	0	0	3
<b>PEC 6-VII</b>							
1	UENAE31	Shipyards Practices and Project Management	3	3	0	0	3
2	UENAE32	Guidance and Control of Marine Vehicles	3	3	0	0	3
3	UENAE33	Warship Technology	3	3	0	0	3
4	UENAE34	Marine Pollution	3	3	0	0	3
5	UENAE35	Coastal Disaster Management	3	3	0	0	3
6	UENAE36	SWAYAM / MOOCs Course	3	3	0	0	3



**CBCS CURRICULUM-2021-22**

**List of open elective courses (OEC) offered by Department of Naval Architecture**

**IV Sem**

Sl. No.	Course code	Title of the OEC1	Contact Hours	L	T	P	C
1	UENAO01	Basic Principles of Marine Vehicle Design	3	3	0	0	3
2	UENAO02	Marine Pollution Regulations	3	3	0	0	3
3	UENAO03	Fundamentals of floating bodies	3	3	0	0	3
4	UENAO04	Fundamentals of Oceanography	3	3	0	0	3

**V Sem**

Sl. No.	Course code	Title of the OEC2	Contact Hours	L	T	P	C
1	UENAO05	Ocean Energy	3	3	0	0	3
2	UENAO06	Quality, Health, Safety and Environmental Management	3	3	0	0	3
3	UENAO07	Introduction to Dredging	3	3	0	0	3
4	UENAO08	Basics of Harbour Engineering	3	3	0	0	3

**VI Sem**

Sl.No.	Course code	Title of the OEC3	Contact Hours	L	T	P	C
1	UENAO09	Introduction to Engineering Simulations – A Hands-on practice	3	3	0	0	3
2	UENAO10	Fishing Vessel and Workboat Design	3	3	0	0	3
3	UENAO11	Ocean Observation and Instrumentation techniques	3	3	0	0	3
4	UENAO12	Fundamentals of offshore Engineering	3	3	0	0	3

**VII Sem**

Sl.No.	Course code	Title of the OEC4	Contact Hours	L	T	P	C
1	UENAO13	Introduction to Underwater Technology	3	3	0	0	3
2	UENAO14	Pipeline and Riser Engineering	3	3	0	0	3





**CBCS CURRICULUM-2021-22**

3	UENAO15	Hull Inspection	3	3	0	0	3
4	UENAO16	Marine Materials	3	3	0	0	3



**CBCS CURRICULUM-2021-22**  
**B.E NA&OE CURRICULUM – CREDIT SHARE**

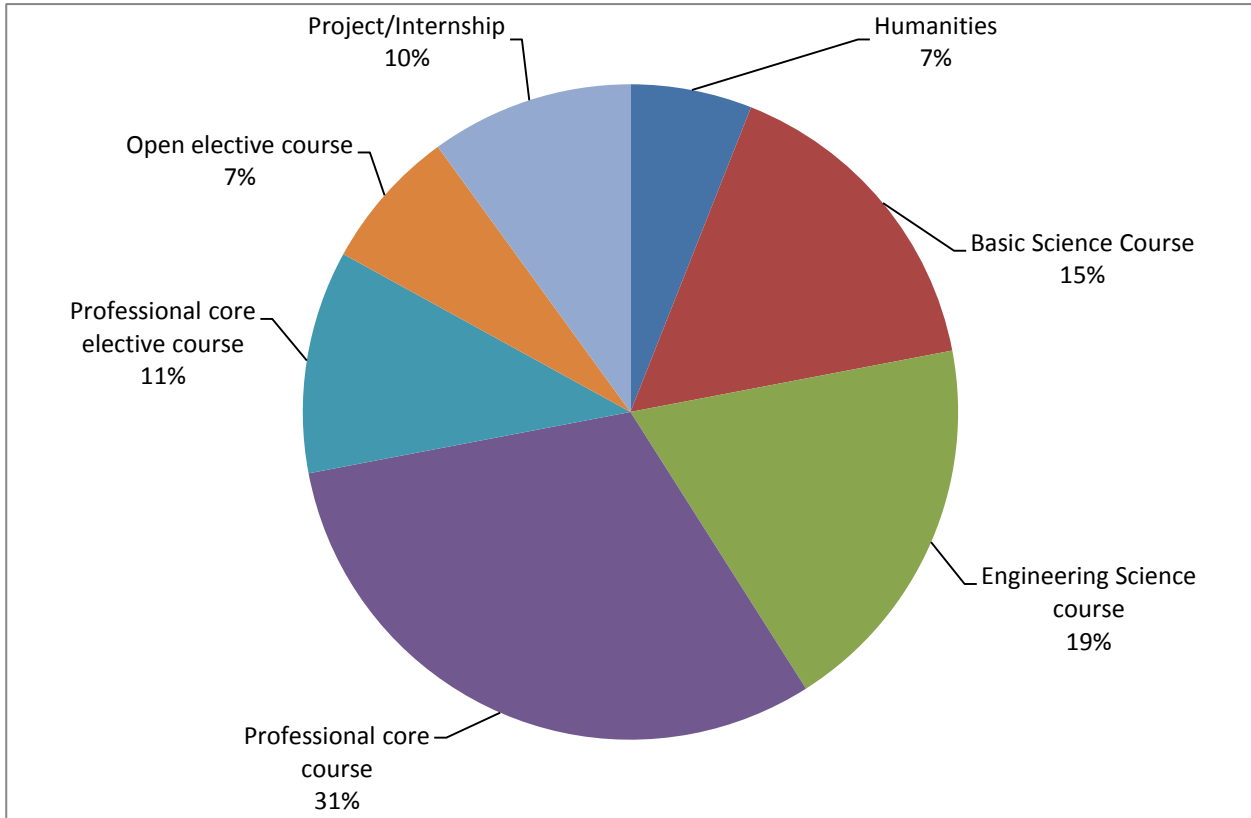
Semester	Contact Hours	Lecture	Tutorial	Practical	Credit
1	23	12	1	10	18
2	31	19	2	10	22
3	30	20	1	9	24
4	28	19	3	6	23
5	21	15	2	4	20
6	27	19	2	6	24
7	27	15	0	12	22
8	20	0	0	20	10
<b>Total</b>	<b>207</b>	<b>119</b>	<b>11</b>	<b>77</b>	<b>163</b>

**Structure of the Program-NA&OE**

Semester	Humanities and Social Sciences including Mgt.	Basic Science Course	Engineering Science Course	Prof. Core Course	Prof.Core elective	Open Elective Course	PROJ/ Internship	Total
1	3	13	2					18
2	1	6	15					22
3	1	4	8	11				24
4	4	2		14		3		23
5	2		3	8	3	3	1	20
6			3	12	6	3		24
7				5	9	3	5	22
8							10	10
<b>Total</b>	<b>11</b>	<b>25</b>	<b>31</b>	<b>50</b>	<b>18</b>	<b>12</b>	<b>16</b>	<b>163</b>



**CBCS CURRICULUM-2021-22**



**NA&OE Curriculum 2021-2022**