

# **D. Y. Patil College of Engineering and Technology**

Kasaba Bawada, Kolhapur

## **F. Y. B. Arch. Structure and Syllabus (Autonomous)**

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**(School of Architecture)**

**2020-21**

**D. Y. PATIL COLLEGE OF ENGG. & TECH., KASABA BAWADA, KOLHAPUR**  
**SCHOOL OF ARCHITECTURE**  
**STRUCTURE FOR B. ARCH. SEM. – I**

Sr. No	Course Code	Course Type	Name of the Course	Teaching Scheme Per Week			Credits	Total Marks	Evaluation scheme			
				Lecture Hours	Tutorial Hours	Practical/ Studio Hours			Type	Max. Marks	Min. Marks for Passing	
										Individual Course	Aggregate	
1	201AR101	PC	Aesthetics & Visual Arts – I	1	-	2	3	100	ISE	100	50	50
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
2	201AR102	PC	Architectural Graphics and Drawing-I	1	-	2	3	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
3	201AR103	PC	**Architectural Design – I	1	-	6	7	200	ISE	100	50	100
									MSE	-	-	
									ESE (OE)	100	45	
									ESE (TH)	-	-	
4	201AR104	PC	** Human Settlement & History of Civilization - I	2	-		2	100	ISE	20	10	50
									MSE	30	15	
									ESE (OE)	-	-	
									ESE (TH)	50	23	
5	201AR105	PC	Carpentry And Model Making Workshop – I		-	2	2	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
6	201AR106	PC	Scope of Architecture -I	2	-		2	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
7	201AR107	BS & AE	*Building Construction & Materials – I	2	-	2	4	100	ISE	20	10	50
									MSE	30	15	
									ESE (OE)	-	-	
									ESE (TH)	50	23	

Sr. No	Course Code	Course Type	Name of the Course	Teaching Scheme Per Week			Credits	Total Marks	Evaluation scheme			
				Lecture Hours	Tutorial Hours	Practical/ Studio Hours			Type	Max. Marks	Min. Marks for Passing	
											Individual Course	Aggregate
8	201AR108	BS & AE	** Basics of Structural Engineering For Architecture - I	3	-		3	100	ISE	20	10	50
									MSE	30	15	
									ESE (OE)	-	-	
									ESE (TH)	50	23	
9	201AR109	SEC	Literary and Communication Skills in Architecture – I	2	-		2	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
10	201AR110	SEC	Computer Technology in Architecture - I		-	2	2	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
11	201ARMC 111	Mandatory Course	Yoga and Physical Management Skill						-	-	-	
<b>Total</b>				<b>14</b>		<b>16</b>	<b>30</b>	<b>850</b>		<b>850</b>		<b>425</b>

ISE - In Semester Evaluation MSE - Mid Semester Examination ESE - End Semester Examination OE - Oral Examination TH - Theory

NOTE :- As per CoA Gazette 2020 norms, minimum passing percentage for each individual course to be minimum 45%

**D. Y. PATIL COLLEGE OF ENGG. & TECH., KASABA BAWADA, KOLHAPUR**  
**SCHOOL OF ARCHITECTURE**  
**STRUCTURE FOR B. ARCH. SEM. – II**

Sr. No	Course Code	Course Type	Name of the Course	Teaching Scheme Per Week			Credits	Total Marks	Evaluation scheme			
				Lecture Hours	Tutorial Hours	Practical/ Studio Hours			Type	Max. Marks	Min. Marks for Passing	
											Individual Course	Aggregate
1	201AR112	PC	Aesthetics & Visual Arts – II	1	-	2	3	100	ISE	100	50	50
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
2	201AR113	PC	Architectural Graphics and Drawing-II	1	-	2	3	100	ISE	50	25	50
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	50	23	
3	201AR114	PC	**Architectural Design – II	1	-	6	7	200	ISE	100	50	100
									MSE	-	-	
									ESE (OE)	100	45	
									ESE (TH)	-	-	
4	201AR115	PC	** Human Settlement & History of Civilization - II	2	-		2	100	ISE	20	10	50
									MSE	30	15	
									ESE (OE)	-	-	
									ESE (TH)	50	23	
5	201AR116	PC	Carpentry And Model Making Workshop – II		-	2	2	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
6	201AR117	PC	Scope of Architecture -II	2	-		2	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
7	201AR118	BS & AE	*Building Construction & Materials – II	2	-	2	4	200	ISE	100	50	100
									MSE	-	-	
									ESE (OE)	50	23	
									ESE (TH)	50	23	

Sr. No	Course Code	Course Type	Name of the Course	Teaching Scheme Per Week			Credits	Total Marks	Evaluation scheme			
				Lecture Hours	Tutorial Hours	Practical/ Studio Hours			Type	Max. Marks	Min. Marks for Passing	
											Individual Course	Aggregate
8	201AR119	BS & AE	** Basics of Structural Engineering For Architecture - II	3	-		3	100	ISE	20	10	50
									MSE	30	15	
									ESE (OE)	-	-	
									ESE (TH)	50	23	
9	201AR120	SEC	Literary and Communication Skills in Architecture – II	2	-		2	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
10	201AR121	SEC	Computer Technology in Architecture - II		-	2	2	50	ISE	50	25	25
									MSE	-	-	
									ESE (OE)	-	-	
									ESE (TH)	-	-	
11	201ARMC 122	Mandatory Course	Democracy, Elections and Good Governance ( Non Credit Mandatory Course)					-	-	-		
<b>Total</b>				<b>14</b>		<b>16</b>	<b>30</b>	<b>1000</b>		<b>1000</b>		<b>500</b>

ISE - In Semester Evaluation MSE - Mid Semester Examination ESE - End Semester Examination OE - Oral Examination TH - Theory

NOTE :- As per CoA Gazette 2020 norms, minimum passing percentage for each individual course to be minimum 45%

\* Means combine passing for & ESE ( OE ) & ESE ( TH )

\*\* Means combined passing for ISE & MSE & ESE ( OE ) & ESE ( TH ) as applicable.

# One lecture means period of One Hour (60 Minutes) and One Studio means studio period of One Hour (60 Minutes)

Total weeks – 14 weeks per semester

<b>ABBREVIATIONS</b>	
<b>PC</b>	Professional Core
<b>BS &amp;AE</b>	Building Sciences And Applied Engineering
<b>PE</b>	Professional Elective
<b>OEL</b>	Open Elective
<b>PAECC</b>	Professional Ability Enhancement Core Courses
<b>SEC</b>	Skill Enhancement Courses

**ANNEXURE A : MANDATORY COURSES**

<b>FIRST YEAR B.ARCH. SEM. - I &amp; II [ANY ONE COURSE TO BE OFFERED PER SEMESTER FROM THE FOLLOWING]</b>		
<b>SR. NO.</b>	<b>TITLE</b>	<b>BRIEF COURSE OUTLINE</b>
1	Yoga and Physical Management Skill	Introduction to Yoga. Benefits of Yoga. Types of yogasanas.
2	Democracy, Elections and Good Governance	Constitution of India, Indian democracy, Citizenship and rights and responsibilities of citizens. Legislative framework.



# D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

KASABA BAWADA, KOLHAPUR-416006

An Autonomous Institute

**F.Y B. Arch.**

**Curriculum w.e.f.2020-2021**

<b>Course Title : Aesthetics And Visual Arts – I</b>	
<b>Course Code : 201AR101</b>	<b>Semester : I</b>
<b>Teaching Scheme : L-T-P : 1-0-2</b>	<b>Credits : 3</b>
<b>Evaluation Scheme : ISE Marks : 100</b>	<b>ESE Marks : --</b>

### **Course Description:**

Aesthetics is a study and appreciation of beauty. The visual arts are art forms that are primarily visual in nature, such as drawing, painting, sculpture, ceramics, printmaking, conceptual art, design, crafts, ceramics, photography, video, film making, and architecture. Aesthetics is also experienced in many artistic disciplines such as music and performing arts. The course intends to develop aesthetic sensitivity towards life as a whole including all art forms and Architecture in particular.

### **Course Objectives:**

1. To develop artistic orientation, artistic skills of students & enhance their artistic sensitivity.
2. To inculcate sensitivity to understand relevance of all art forms to Architectural spaces and forms.
3. To Create holistic understanding of grammar of design with specific reference to Architecture.
4. To make the students understand effect of human dimensions, human actions, human emotions and human behavior affecting both Architectural form and space.

### **Course Outcomes (COs):**

At the end of the course the student should be able to:

101.1	Sketch in various media & material, to use drawing for co-ordination of eye & hand in studio & field observation, judge scale, proportion, spatial relationships.
101.2	Appraise aesthetics in everyday life
101.3	Create 2D compositions with the use of elements and apply principles of design.
101.4	Apply the knowledge of color theory and rendering techniques for Architectural design assignments and portfolio

**Prerequisite: An attitude to learn and internalize the artistic orientation and skills taught.**

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
<b>101.1</b>	3	3	3	3	2	–	–	–	2	3	–	–	3	3	3,5
<b>101.2</b>	2	2	2	2	2	–	–	–	2	2	–	–	2	2	1,5
<b>101.3</b>	3	3	3	3	2	–	–	–	2	3	–	–	3	3	4,5,6
<b>101.4</b>	3	3	3	3	2	–	–	–	2	3	–	–	3	3	1,2,3

<b>Contents</b>	<b>Hours</b>
<p><b>Unit No. 1 –Sketching</b></p> <ul style="list-style-type: none"> <li>• Introduction to basic 2D and 3D sketching, understanding light, shades and shadows, freehand sketching; building sketches, landscape elements, household furniture, street furniture, human beings, cars, trees , animals, etc.</li> <li>• Outdoor sketching using media like (pencils, ink pens, charcoal pencils, water colors, poster color s, pastel etc.)</li> <li>• Study of different rendering techniques using various media.</li> </ul>	6
<p><b>Unit No. 2 - Aesthetics as part of life &amp; Relation of all Art forms to Architecture</b></p> <ul style="list-style-type: none"> <li>• Study Aesthetics as part of life through observation and conducting simple types of surveys.</li> <li>• Relation of all fine arts like drawing, painting, sculpture, ceramics, printmaking, conceptual art, design, crafts, ceramics, music and performing arts etc. to each other in everyday life.</li> <li>• Beauty in human activities</li> </ul>	6



<b>Unit No. 3 –Primary elements in Architecture</b> <ul style="list-style-type: none"><li>• Elements of design such as point, line, shape, form, mass, space, color and texture patterns, light and shade; understanding the relations between them.</li></ul>	6
<b>Unit No. 4 – Ordering Principles in Architectural Design</b> <ul style="list-style-type: none"><li>• Principles of design such as harmony ( unity), proportions, contrast, scale, balance (symmetric &amp; asymmetric), rhythm (pattern), emphasis, scale proportion , transformation , expression ,axis, vista , circulation, field, character, ornamentation in Architecture and composition.</li><li>• Composition using 2D shapes for above mentioned principles of design., understanding of figure and ground, positive and negative spaces, use of color textures and</li></ul>	6
<b>Unit No. 5 – Form and space</b> <ul style="list-style-type: none"><li>• Elements of spatial definition (Form defining space) elevated base plane, depressed base plane-vertical and horizontal space defining elements – depth and density of space – spatial juxtaposition and interpretation – spatial character of elementary shapes – qualities of Architectural space – Degree of enclosure.</li></ul>	6
<b>Unit No.6- Color theory</b> <ul style="list-style-type: none"><li>• Properties of color, color schemes, color value, intensity, Color texture, psychological effect of color. Its application in Architectural design assignments.</li></ul>	6

**Reference Books:**

- 1) Francis D.K. Ching, Architecture form, space and order, John Miley and Sons.
- 2) Albert O Halse, Mcgraw, Architectural rendering Hill Book Company.
- 3) V. S. Pramar, Design Fundamentals In Architecture, Somaiya Publication Pvt. Ltd.
- 4) Francis D.K. Ching, Architectural Graphics, John Miley And Sons.
- 5) Francis D.K. Ching, Global History of Architecture, John Miley And Sons.
- 6) Teen Eiler Rasmussen, Experiencing Architecture, MIT press, 1964.



Course Title : <b>Architectural Graphics and Drawing - I</b>	
Course Code : <b>201AR102</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 1-0-2	Credits : 3
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

**Course Description:**

Graphics is a language of expressing ideas. This course intends to develop graphical understanding and visualization of students to express their ideas through two dimensional and three dimensional sketches and drawings along with various presentation techniques. Graphics is basic course which supports all drawing based courses of the program and enables students to understand basic principles like scale, proportion, graphical symbols, representation etc.

**Course Objectives:**

1. To introduce fundamental drafting techniques.
2. To develop an ability to present elements of design in graphical forms.
3. To develop an ability to visualize objects in 2 Dimensions and 3Dimensions.
4. To enhance the potential of students in presenting concepts and ideas in terms of sketches, drawings, and models using different techniques.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

102.1	Prepare drawing sheets of simple nature using various drafting techniques.
102.2	Represent elements of design in graphical forms.
102.3	Represent simple and complex objects in 2D and 3D graphical form.
102.4	Develop a skill to represent concepts and ideas in terms of sketches, drawings, and models using different techniques and media.

Prerequisite: Students should have an understanding and flair of sketching of various types viz. object sketching, memory sketching etc.



**Curriculum w.e.f. 2020-2021**

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
102.1	3	3	3	3	3	-	-	-	2	3	-	3	1	1	1,2
102.2	3	3	3	3	3	-	-	-	2	3	-	3	2	1	2,3
102.3	3	3	3	3	3	-	-	-	2	3	-	3	2	2	3,4
102.4	3	3	3	3	3	-	-	-	2	3	-	3	3	2	5,6

Contents	Hours
<b>Unit No. 1</b> <ul style="list-style-type: none"> <li>Introduction of drawing instruments such as drawing board set- squares tee square, French curve, stencils, different types of pencils and pens and their uses, including simple assignments to get acquainted with these instruments.</li> <li>Introduction to Architectural lettering, size and notation of drawing, symbolic representation of building elements and material, other features as per I.S.I and standard practice. Assignments included for lettering and architectural symbols.</li> </ul>	6
<b>Unit No. 2</b> <ul style="list-style-type: none"> <li>Scale drawing, construction of various metric scales, normally used scale, use of metric scale for various purposes.</li> </ul>	6
<b>Unit No. 3</b> <ul style="list-style-type: none"> <li>Introduction of various media of drawing and presentation such as pencil, charcoal crayon, water colour, sketch pens, inks etc. and exercise using all these media.</li> <li>Continuous exercises for development of freehand sketching using different media mentioned above at different spaces and different locations.</li> </ul>	9

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Curriculum w.e.f. 2020-2021

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<b>Unit No. 4</b> <ul style="list-style-type: none"><li>• Introduction and understanding of plane, elevation and section.</li><li>• Principles of orthographic projection, projection on points, lines, planes, solids.</li><li>• Solid geometry to explain the need of solid geometry in architectural drawings. Exercise involving geometrical forms, presented in different positions of individual object and then in group.</li></ul>	9
<b>Unit No. 5</b> <ul style="list-style-type: none"><li>• Measured drawing of small objects, such as building elements, small furniture units and small built forms.</li></ul>	6

**Reference Books:**

- 1) N. Bartony, I. Chernov: Architectural Engineering, revised edition 1986, MIR Publishers Moscow.
- 2) Keith Styles: Working Drawing handbook 2<sup>nd</sup> Edition 1986, McGraw-Hill.
- 3) H. Joseph and Morris: Practical plane and solid geometry.
- 4) Gill Robert: Rendering with pen and ink, Edition 2013, Affiliated East – West Press Private Limited.
- 5) Thames and Hudson, London: Rendering with Pen and Ink, Thames and Hudson 1981.
- 6) Jax Themier, B.W., How to Paint and Draw, Thames and Hudson, 1985.
- 7) M.G.Shah, C. M. Kale, S. Y. Patki : A Reference book of Building Drawing, 3<sup>rd</sup> edition, McGraw-Hill 1997.
- 8) The American Institute of Architects, Architectural Graphic Standards, 11th edition, John Wiley and Sons.

Course Title : <b>Architectural Design - I</b>	
Course Code : <b>201AR103</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 1-0-6	Credits : 7
Evaluation Scheme : ISE Marks : <b>100</b>	ESE(OE) Marks : 100

**Course Description:**

The course intends to imbibe Architectural design fundamentals i.e. relationship between people to built form and built form to environment, analytical study, pre design process, evolution/conceptualization stage and design process. It also intends to use design communication skills like verbal, script and most importantly, graphics.

**Course Objectives:**

1. To get familiarized with human scale, basic ergonomics.
2. To develop perception for basic principles of space making and form building.
3. To understand the functionality of single use and small functional spaces.
4. To use drawing as a communication tool for design information.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

103.1	Analyze requirements for specific user and function.
103.2	Understand the fundamentals of Architectural design, elements and principles
103.3	Design the given assignment by using the knowledge gained.
103.4	Apply graphical representation skills to represent design concepts and ideas.

Prerequisite: An attitude to learn and internalize the training given for the course.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes (PSOs)**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
103.1	3	2	2	-	-	2	2	-	2	-	-	-	-	-	4
103.2	3	2	2	-	-	2	2	-	2	-	-	-	-	-	2
103.3	3	2	2	-	-	2	2	-	2	-	-	-	3	-	6
103.4	3	2	2	-	-	2	2	-	2	-	-	-	-	2	3

Contents	Hours
<b>Unit No. 1 – Study of Anthropology &amp; Ergonomics in Architecture</b> <ul style="list-style-type: none"> <li>• Creating sensitivity towards Anthropology- human dimensions, human figure, human actions, human scale, and human feelings. How all four shape the Architectural form and space.(with examples)</li> <li>• Golden section, Golden triangle, Le Modular, Fibonacci series.</li> <li>• Introduction of basics of Ergonomics in Architecture.</li> </ul>	7
<b>Unit No. 2 – Concepts in Architectural Design</b> <ul style="list-style-type: none"> <li>• Concepts in Architectural Design – concept types- Ideas and intend in design (intuitive , contextual , iconic , experiential , symbolic, modular)</li> <li>• Ideologies and philosophies of architects</li> </ul>	7
<b>Unit No. 3 –Building Components &amp; Importance of graphics</b> <ul style="list-style-type: none"> <li>• Basic components of a building and their functions.</li> <li>• Importance of graphics in architectural design. Study of conceptual sketches, conceptual drawings, site plan, plans, and city plans etc. Interpretation of architect’s conceptual sketches and the respective building,</li> </ul>	7

## Curriculum w.e.f. 2020-2021

<p><b>Unit No. 4- Data collection for Architectural design</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Principals of Design with reference to function, various activities and related spaces. Data collection, environment, climate, orientation, site conditions, circulation.</li> <li><input type="checkbox"/> Study of basic human Needs, Various requirements according to the given project.</li> </ul>	7
<p><b>Unit No. 5-Report presentation</b></p> <ul style="list-style-type: none"> <li>• Group work (Student's team) for site visit, data collection, analysis report presentation of given site.</li> <li>• Group work(Student's team) for physical case studies of assigned projects, data collection and report presentation.</li> </ul>	7
<p><b>Unit No.6- Design</b></p> <ul style="list-style-type: none"> <li>• Study &amp; comparison of single units like living spaces, sleeping and cooking spaces, stalls, bus-stops, telephone booths etc. detailed design of single room for simple function, showing relationship with adjoining areas for other activities not more than 25 SQ. MT.</li> </ul>	49

## Notes:

- a. Exercise related to each unit has to be carried out distinctively.
- b. Relevant case studies and literature studies can be given by the studio teachers and report has to be compiled by the students.
- c. One of the design exercises can be carried out as group work to explore possibilities of students working as teams.
- d. Vertical studio involving other semesters can be encouraged to carry out one full or part project.
- e. The portfolio covering the above topics shall be presented for viva voce.
- f. Projects to be presented with help of drawings, sketches and models (study models and final models). Application of techniques learnt in visual arts and architectural graphics have to be incorporated.
- g. The projects listed in the syllabus is only to state the scale and complexity. The projects of similar scope can be introduced by the teachers.

**Reference Books:**

- 1) Joseph De Chiara, Time saver standards for building types – McGraw-Hill Inc., US; 3rd Revised edition.
- 2) Ernst Neufert, Neufert- architects data – Third edition, Wiley India Pvt Ltd.
- 3) Robert W. Gill, Rendering with Pen and Ink, Thames & Hudson.
- 4) D. K. Ching , Third edition - Form, Space & Order, John Wiley & Sons, Inc.
- 5) Charles Harris, Time saver standards for landscape architecture, Second edition, McGraw Hill Education.
- 6) Wucius Wong, Principles of three imensional Design, Van Nostrand Reinhold NY.
- 7) Maier Manfred, Basic principles of Design, Van Nostrand Reinhold NY
- 8) Yatin Pandya - Elements of Space Making, Mapin Pub., 2007.
- 9) Ramsey and Sleeper -Architectural Graphics Standards, John Wiley & Sons.



Curriculum w.e.f. 2020-2021

Course Title : <b>Human Settlement &amp; History of Civilization - I</b>	
Course Code : <b>201AR104</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 2-0-0	Credits : 2
Evaluation Scheme : ISE + MSE Marks : <b>20+30</b>	ESE Marks(TH) : <b>50</b>

**Course Description:**

Human settlement & History of civilization is important for learning and understanding of different settlements, evolved in different parts of the world. It explains the relationship of man & settlement along with various aspects - socio-cultural, economic, climatic and geographic conditions. This course intends to develop an understanding of settlements and overall built environment.

**Course Objectives:**

1. To study the settlements and the history of civilization from prehistoric period and ancient civilizations.
2. To understand the influence of geography, geology, climate, socio-climate and religious aspect of that particular place on settlement patterns and architectural built form.
3. To carry out comparative study of various civilizations.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

104.1	Compare specific planning and design approach to human settlements during various periods.
104.2	Apply knowledge of human settlements and civilization and relate it to modern concepts of planning.
104.3	Analyze the settlement pattern and architectural built form which has influence of geography, geology climate etc.
104.4	Evaluate comparative study of various civilizations.

Prerequisite: Knowledge of different civilizations from Pre-historic period and their evolution.



**D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

**KASABA BAWADA, KOLHAPUR-416006**

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**F.Y B. Arch.**

**Curriculum w.e.f. 2020-2021**

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
104.1	3	-	-	-	1	2	2	-	-	1	-	1	2	1	1,2
104.2	3	2	1	-	-	2	-	-	1	1	-	1	2	1	2,3
104.3	3	2	1	-	-	2	2	-	1	1	-	1	2	1	3,4
104.4	3	2	2	-	1	2	2	-	1	1	-	1	2	1	4,5

**Curriculum w.e.f. 2020-2021**

<b>Contents</b>	<b>Hours</b>
<b>Unit No. 1 – Prehistoric period</b> Evolution of man, relation in between Man and environment, rise of culture and religion, Stone Age, Bronze Age, Iron Age, Culture and civilization.	4
<b>Unit No. 2 -</b> General features/influences of human settlement factor responsible for the development of human settlement. Comparative case study of human settlements in rural area (wadi) and urban area (urban settlement).	4
<b>Unit No. 3 – Nile valley civilization</b> Influences/aspects, architectural characters, Burial system, Egyptian temple, Egyptian city [city Kahun] planning.	4
<b>Unit No. 4 - Greek civilization</b> Influence/ aspects, architectural characters, Study of Greek cities in detail, city Athens.	3
<b>Unit No. 5 - Roman civilization</b> Influence /aspect, architectural characters, study of roman cities, Roman Military town	3
<b>Unit No.6- Mesopotamian civilization</b> Influence/aspects, architectural characters, city Babylon, city Ur, ziggurat, Hanging Garden [Sumerian , Assyrian and Babylonian ] • A: Indus valley civilization- Influence/aspects, architectural characters, Mohenjo- Daro city planning • B: Vedic civilization – Vedic village	6

**Text books:**

- 1) Abir Bandyopadhyay, Town Planning, Books & Allied Ltd.

**Reference Books:**

- 1) James Edgar Swain, A History of World Civilization, McGraw-Hill Book Company.
- 2) H. A. Davies, An Outline History of The World, Read Books; Illustrated edition.
- 3) G. K. Hiraskar, Fundamentals of Town Planning , Dhanpat Rai Publications
- 4) The urban pattern – city planning and Design-Arthur B. Gallion FAIA Simon Eisner,AICP
- 5) Sir Banister Fletcher's- A history of architecture - Revised by J. C. Palmes, New York : Scribner, 1975
- 6) G. K. Hiraskar, The Great Ages Of World Architecture, Dhanpat Rai Publications.
- 7) K. R. Thooyavan , Human settlement- A planning guide to beginners, Ma Publication
- 8) Vedula V L N Murthy, Indian architecture, Standard Publishers Distributors.

Course Title : <b>Carpentry and Model Making Workshop – I</b>	
Course Code : <b>201AR105</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 0-0-2	Credits : 2
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

**Course Description:**

This course offers an introduction of various materials, techniques used for architectural model making, basic concept of carpentry. It emphasizes the basic understanding of hands on experiment skills to create and present two dimensional and three dimensional scaled models.

**Course Objectives:**

1. To introduce different materials such as paper, mount board, foam board, clay, wood, etc. and tools and techniques of architectural model making and basic processes for carpentry.
2. To demonstrate relationship of models with other courses like 'Architectural Design', 'Building Technology' and 'Graphics'
3. To give hands on skill experience of simple building material and construction Techniques.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

105.1	Select appropriate material for model making.
105.2	Apply the knowledge of material and techniques used in process of two dimensional and three dimensional model making.
105.3	Create three dimensional scaled models.

**Prerequisite:** Understanding towards three dimensional aspect.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
105.1	3	1	-	-	1	-	-	-	-	-	-	1			1,2
105.2	3	1	-	-	1	-	-	-	1	-	-	1			2,3
105.3	3	1	-	-	1	-	-	-	-	-	-	1			2,6

Contents	Hours
<b>Unit No. 1</b> Three dimensional objects – 3 Assignments Two assignments to be done individually by using Paper, Foam Board, Mount Board etc., One assignment to be done in Group by using Clay material.	6
<b>Unit No. 2 -</b> Models based on Design projects- 2 Assignments to be done individually on given design assignment by using different model making techniques and materials like Paper, Foam Board, Mount Board etc..	8
<b>Unit No. 3 –</b> Based on building technology- 5 Assignments to be done in group on given topic by using different model making and carpentry work techniques in various materials like Paper, Foam Board, Mount Board etc.	4
<b>Unit No. 4 –</b> Based on Graphics –5 Assignments to be done individually on given subject assignment by using different model making materials like Paper, Foam Board, Mount Board etc.	6

**Reference Books:**

- 1) John Taylor, Model Building for Architects and Engineers, McGraw Hill Co., NYC; 2<sup>nd</sup> edition
- 2) Janke Rolf, Architectural Models, Frederick A. Praeger, Inc., New York, New York, U.S.A. (1968)

Course Title : <b>Scope of Architecture - I</b>	
Course Code : <b>201AR106</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 2-0-0	Credits : 2
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

**Course Description:**

The course intends to unfold the profession of architecture in front of students by introducing its scope along with interrelationship of various branches of architecture and roles & responsibilities of an architect. This course provides conscious and rational approach towards architectural education.

**Course Objectives:**

1. To explain the scope of architectural education.
2. To introduce the scope of field of architectural profession.
3. To explain role of architect in architectural profession.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

106.1	Describe the scope of architectural education.
106.2	Describe the scope of field of architectural profession.
106.3	Describe role of architect in architectural profession and society.

**Prerequisite:** Nil

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
106.1	2	-	-	-	-	2	-	2	-	2	-	2	-	-	2
106.2	3	-	-	-	-	3	-	3	-	2	-	2	-	-	2
106.3	2	-	-	-	-	2	-	2	-	2	-	2	-	-	2

Contents	Hours
<b>Unit No. 1 - Introduction to architectural education</b> Introduction to various courses of the program, value added courses, interrelationship of various courses, role of allied art forms in architectural education - Architecture as mother of all arts.	4
<b>Unit No. 2 – Introduction to Planning and designing</b> Difference between planning and designing, importance of both in profession. Site planning, Functional planning, Importance and relevance of functional aspect of architectural design, Planning for various types of activities, various building types, function affecting activity pattern.	6
<b>Unit No. 3 – Introduction to different disciplines of architecture</b> Different disciplines of architecture, their interrelationships and architect's role therein, Various branches of architecture, types of specializations, Interior design and landscape design as integral part of comprehensive architectural design.	6
<b>Unit No. 4 – Introduction to profession of architecture</b> Nature of architectural practice, architect's office, work culture, Scope of architect's activities - Pre design, during design, during construction and post construction activities, Correspondence and Record keeping, Public relations - Publicity through website and print media, Role of Council of Architecture in profession, Introduction to apex body Council of Architecture, India. Registration of architects, code of conduct, Futuristic skill sets required for architects, digital literacy, modern tool usage, architect & society.	8



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**Reference Books:**

- 1) Ahmed A. Kasu, Interior Design, Ashish Book Centre, Mumbai, 2014, 6<sup>th</sup> Edition.
  - 2) Anatxu Zabaibeasca, The Architect's Office, Gustavo Gili, Barcelona, 1996.
  - 3) Francis D. K. Ching, Architecture- Form, Space , And Order, Third Edition, 2007, John Wiley & Sons, Inc., Hoboken, New Jersey.
-

Course Title : <b>Building Construction and Materials – I</b>	
Course Code : <b>201AR107</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 2-0-2	Credits : 4
Evaluation Scheme : ISE + MSE Marks : <b>20+30</b>	ESE(TH) Marks : 50

**Course Description:**

This course offers an introduction to the building techniques, components, conventions, and an understanding of various types of basic building materials such as bricks and stones with different building types. It emphasizes the basic understanding of structural behavior and its principles, basic building components and application in construction technology.

**Course Objectives:**

1. To introduce building construction techniques, components, conventions and application of basic building materials brick and stone.
2. To help students in developing a clear understanding of the basic principles of construction and materials suitable for load bearing construction and framed structure.
3. To gain knowledge of structural components sub-structure & super structure.
4. To encourage a mix of classroom work, field learning and hands on experiment.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

107.1	Understand structural typology and building components.
107.2	Select suitable materials for buildings and adopt suitable construction techniques.
107.3	Apply knowledge of construction process for supervise the construction of different building elements based on suitability.

**Prerequisite:** Understanding of two dimensional drawing.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes (PSOs)**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
107.1	3	2	2	-	-	2	2	-	2	-	-	-	-	-	1,2
107.2	3	2	2	-	-	2	2	-	2	-	-	-	-	-	2,3
107.3	3	2	2	-	-	2	2	-	2	-	-	-	3	-	2,3
107.1	3	2	2	-	-	2	2	-	2	-	-	-	-	-	1,2

Contents	Hours
<p><b>Unit No. 1 – Excavation &amp; foundation in various types of soils. Material:</b> Different types of soils and physical properties with respect to effect of various aspects like weather, water, temperature etc. bearing capacity, concept of bulb of pressure.</p> <p><b>Construction:</b> <b>Introduction-</b> Need for foundations, Plinth filling details, Damp Proof Course, timbering to trenches (stay bracing, Box Sheeting, Vertical Sheeting, runner system, sheet piling) Strip Foundations suitable for load bearing structures in stone and brick up to plinth level including foundation for steps.</p>	12
<p><b>Unit No. 2 – Load bearing &amp; framed structure Construction:</b> <b>Introduction</b> -Various building materials which are commonly used in load bearing construction like stone, brick, concrete blocks, mud blocks, etc <b>Types of Structure</b> -Load bearing structure &amp; Framed Structure and its principles with respect to type of soil &amp; its bearing capacity.</p>	8

<p><b>Unit No. 3 - Brick</b>  <b>Masonry Material:</b>  <b>Introduction-</b> Brick manufacturing processes and properties as per I.S.I. standard and market forms. Different types of bricks such as sundried brick, burnt clay bricks, concrete bricks, fly ash bricks &amp; special types of bricks and their applications.  <b>Construction:</b>  <b>Introduction-</b> Brick as a building material which is commonly used in load bearing and framed construction with reference to different types of bonds like Stretcher, Header, English &amp; Flemish bonds etc.  Piers pillars; in brick and stones load bearing foundation, Function of Masonry retaining wall. <b>Case Study-</b>Field visit to brick kiln and construction site.(hands on workshop – construct types of bond)</p>	12
<p><b>Unit No. 4 Stone</b>  <b>Masonry Material:</b>  Method of quarrying origin and composition of stones, natural bed, properties of good stones, various types of stone, dressings defects in stone, stones used as building material.  <b>Construction:</b>  <b>Types of Stone Masonry-</b>  Terminology of stone masonry such as stone dressing, stone joints ( plain, beveled, rebated dowel, clamp joint, monolithic construction of columns, quoins, header bond of through stones)  Ashlars and Rubble stone masonry &amp; their types with respect to wall thickness. Study of Buttresses  <b>Case Study-</b>Field visit to stone quarries and construction site.</p>	8
<p><b>Unit No. 5 – Finishes - Pointing and Plastering</b>  <b>Material:</b>  <b>Introduction:</b> Mortar and its types, various pointing and plastering materials used in building construction, techniques and their processes.  Types of plastering such as sand faced, neeru finish and other finishes.  <b>Construction:</b>  <b>Introduction-</b> Use of scaffolding, single and double scaffolding for finishing work in different materials such as bamboo, timber and steel scaffolding.</p>	4
<p><b>Unit No.6- Earthquake resistant structures Construction:</b>  Introduction- Types of earthquake and earthquake resistant measures for load bearing construction.</p>	4

**Sessional Work**

Hand drawn drawings on Units 1 to 5; Assignments on units 1 to 6



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**Text Books**

- 1) Rangwala K.S., Engineering Materials, Charotar Publishing House Pvt. Ltd., 34<sup>th</sup> Edition (2007).
- 2) Rangwala S. C., A reference book of Building Construction, Pradipkumar R. Patel Publishing, 31<sup>st</sup> Edition (2013).
- 3) Duggal S.K., Building Materials, New Age International Publishers, 3<sup>rd</sup> Revised Edition: (2011).
- 4) Sushil Kumar, Building Construction, A. K. Jain Publishing, 20<sup>th</sup> Edition (2010).
- 5) Dr. Punmia. B.C., Er. Ashok Kumar Jain & Dr. Arun Kumar Jain. A reference book of Building Construction, Laxmi Publication Pvt. Ltd., 10<sup>th</sup> Edition (2009).

**Reference Books:**

- 1) Agarwal B.K., Engineering Materials, Tata McGraw Hills Publishing, (2010).
  - 2) Chudley Roy & Greeno Roger, Building Construction Handbook, Elsevier Ltd Publishing, 8<sup>th</sup> Edition (2010).
  - 3) Chudley Roy, Construction Technology, Pearson India Education Services Pvt. Ltd. Publishing, 2nd Edition (2015)- (Volume- II & IV).
  - 4) W.B. Mackay, Building Construction, Pearson India Education Services Pvt. Ltd. Publishing, 5th Edition (Metric) (2013) (Volume-I,II,III & IV).
-

Course Title : <b>Basics of Structural Engineering For Architecture - I</b>	
Course Code : <b>201AR108</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 3-0-0	Credits : 3
Evaluation Scheme : ISE + MSE Marks : <b>20+30</b>	ESE (TH) Marks: 50

**Course Description:**

This subject brings the architectural imagination from paper to the ground in reality. It provides thorough knowledge of various loads acting on structure, behavior of structure and structural strengths of various building materials. This knowledge will help the students to select the proper structural system with appropriate materials as per the required circumstances. This subject helps students to make their designs structurally feasible.

**Course Objectives:**

- 1) To introduce basic concepts of structural engineering.
- 2) To explain different force systems and their equilibrium.
- 3) To introduce the concept of support, support reactions, loads, bending, shear and friction.
- 4) To take structural engineering to exerted level of art.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

108.1	Classify various structural materials based on their properties.
108.2	Apply knowledge of structural system.
108.3	Select proper thinking path for problem analysis.
108.4	Develop an aesthetical attitude towards structural engineering.

Prerequisite: Basic knowledge of Hooks Law, stress, strain and elasticity.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
108.1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	1,2
108.2	1	2	1	2	1	2	1	2	1	2	-	-	-	-	1,2,3
108.3	1	2	1	2	1	2	1	2	1	2	-	-	-	1	1,2,3
108.4	-	2	-	2	-	3	-	3	-	3	-	-	1	-	1,2,3

Contents	Hours
<p><b>Unit No. 1 –Introduction</b> Aim and scope of study of theory of structure for Architects. Art of Structural engineering. Various planes related with structure. The Engineering - architect relationship. Technical names and function of various structural components from foundation to roof. Concept of simple load bearing, frame structure and composite structure and its application ( Historical background of relevant development). Introduction to IS codes. Site visit to study various structural systems and report related to above.</p>	12
<p><b>Unit No. 2 –Loads</b> Various types of load such as dead load, live load, wind load and earthquake, thermal and settlement load, dynamic load and their effects on structure and relevant IS codes. Factor of safety.</p>	6
<p><b>Unit No. 3 - Force and moments</b> Definition, cause effects, units force as vector, Graphical representation. Resolution of forces by graphical and analytical method. Concept of resultant and equilibrium of forces. Types of forces – coplanar, non coplanar, concurrent, non concurrent and parallel force. Moment of force, moment of couple effects, Lami's theorem, free body diagram. Simple problems on Lami's theorem and moment.</p>	12

**Unit No. 4 - Support Reactions**

Types of Beam, Loading and Support condition ( hinge and roller) and support reaction calculations for simply supported beams , cantilever beams and overhang with point load and UDL and their significance. Simple problems on above. Simple models of different types of beams to learn the changes in form of structure according to beam and column positions. Case study (of nearly 80 to 100 m<sup>2</sup> area) related to type of beams and its span accordingly.

6

**Sessional Work**

Minimum 4 assignments based on above topics and site visits and case study reports.

**Text Books:**

- 1) M. N. Avadhanulu and P. G. Kshirasagar. A text book of Engineering Physics, S. Chand Publishing, 9th Revised Edition (2014).

**Reference Books:**

- 1) RK Bansal and Sanjay Bansal, Engineering Mechanics, Laxmipublications, NewDelhi.
- 2) F.L. Singer, Engineering Mechanics, HarperCollinspublications.
- 3) Curt Siegel, Sturcture and form in modern architecture, Crosby Lockwood And Son Ltd.
- 4) Alan Holgate, The art in structural design, Oxford University Press, New York.

Course Title : <b>Literary and Communication Skills in Architecture – I</b>	
Course Code : <b>201AR109</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 2-0-0	Credits : 2
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

**Course Description:**

The course is oriented towards the understanding of literature related to architecture and allied fields through book reading, understanding contents, deriving abstract and writing about their learning outcomes. The course also intends to develop skills to present the learning outcomes effectively.

**Course Objectives:**

1. To explore the relationship between architectural discourse and architectural communication
2. To understand the intersection of allied fields of architectural communication
3. To apply communication techniques and skills learnt in creative manner

**Course Outcomes (COs):**

At the end of the course the student should be able to:

109.1	Describe the importance of verbal and nonverbal communication in architecture.
109.2	Develop a critical approach through the small exercises like debates, role play etc.
109.3	To present himself /herself efficiently through group presentations.
109.4	To read a book, analyze, summarize and express his/her learning outcomes through literary medium.

Prerequisite: Basic grammatical knowledge.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
<b>109.1</b>	3	2	-	-	1	-	-	1	3	3	-	-	-	-	2
<b>109.2</b>	3	2	-	-	1	-	-	1	3	3	-	-	-	2	2,4
<b>109.3</b>	3	2	-	-	1	-	-	1	3	3	-	-	-	-	2,3
<b>109.4</b>	3	2	-	-	1	-	-	1	3	3	-	-	-	2	2,3

Contents	Hours
<b>Unit No. 1 – Introduction to Communication</b> Language, Grammar, Speaking, Writing and Understanding skills. Drills: Vocabulary, pronunciation ,building sentences. Book reading and Understanding its Contents. Orientation towards book reading and referring, understanding every content of the book, literature and diagrams ,images, references, bibliography etc.	8
<b>Unit No. 2 – Developing Professional Writing skills</b> Techniques and exercises for Essay Writing, Dialogue Writing, Skit writing with respect to understanding spaces of architecture. Letter writing ( Simple application ,Inquiry, Order etc.), E-mail writing, Resume Preparation, Preparing an Event Report.	8
<b>Unit No. 3–Understanding skills</b> Research paper Review, concise presentation of research paper content, a debate on the main content of the paper, writing.	4
<b>Unit No. 4 -Developing Soft skills</b> Learning to deliver exercises using word processing, MS excel, Photoshop, sketch up etc.	4

**Sessional Work**

Minimum 5 assignments based on above topics



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**Reference Books:**

- 1) Ajmani.J.C – Good English: Getting It Right, Rupa & Co.
  - 2) Hasson Gill – Brilliant Communication Skills, Pearson Education India; first edition
  - 3) Raman, Meenakshi and Sangeeta Sharma – Technical communication principles and practice, Oxford University Press.
  - 4) Rob Biesenbach – Unleash the power of storytelling-win hearts, change minds and get results, Eastlawn Media
  - 5) Jain,Bhatia and Sheikh, Professional communication skills, S. Chand Publishing.
  - 6) Mohan & Meera Banerji, Developing communication skills, Laxmi Publications.
-

Course Title : <b>Computer Technology In Architecture -1</b>	
Course Code : <b>201AR110</b>	Semester : <b>I</b>
Teaching Scheme : L-T-P : 0-0-2	Credits : 2
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

**Course Description:**

Architecture is always expressed through drawing mode and maintains a close relationship to the mode and techniques of representation. The content of course discusses the basic introduction of the computer softwares required for the architectural presentation. Course offers an opportunity to be at the forefront of the emergent practice of digital era. Using various softwares & techniques, an Architecture student can perform their project designs spending less energy-time but more realistic.

**Course Objectives:**

- 1) To teach basic computer skills required for architectural profession and to make all students proficient in computer technology.
- 2) To teach technical aspects of software which will be used in the academic work.
- 3) To develop design ideas and draft construction documents using computer-aided design (CAD) software.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

110.1	Express essential skills which will help them to use in daily academic work
110.2	Apply knowledge of computer software in their academic work
110.4	Create projects using different technologies and apply in the competitive world which makes their work easier & faster

Prerequisite: Architectural Graphics.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
110.1	1	-	1	-	3	1	-	1	-	1	1	1	-	-	1,2
110.2	1	-	1	-	3	1	-	1	-	1	-	1	-	1	4
110.3	1	2	1	2	3	1	-	1	2	1	1	2	1	1	3
110.4	1	1	1	-	3	1	-	1	-	2	-	1	-	-	3,6

Contents	Hours
<b>Unit No. 1 –</b> Setting of drawing units and limits. All 2 Dimensional drawing commands. All 2 Dimensional edit commands.	4
<b>Unit No. 2 –</b> Concept of layer, line types, Dimensions, Introduction to block and application. Text style and fonts. Introduction of Hatch and its patterns.	4
<b>Unit No. 3 –</b> Drafting different types of staircases in plan and in section. Drafting floor plan of a building with above learnt commands. Drafting of building elevation and section with reference to plan. Isometric drawing.	6
<b>Unit No. 4</b> Scale command. Use of scale command in architectural drawings. Drawing at different scales, composition of drawing at different scales e.g. municipal drawing (concept of paper space & model space) Use of line weights in architectural drawings.	2
<b>Unit No. 5</b> Different types of styles e.g. dimension style, text, style, symbol library, selection of fonts. Preparing presentation drawings with help of auto cad library.	4
<b>Unit No. 6</b> Using different scales in one drawing. Printing of municipal drawing. Output of the presentation drawing through printer or plotters.	4



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**Sessional Work**

Minimum one drawing showing plan, elevation, section of a project with use of layers, lettering and dimensioning

**Reference Books:**

- 1) Mikell .P. Groover, CAD/CAM Computer –Aided Design & manufacturing, Prentice Hall; 1st edition.
  - 2) Voisinet, Introduction To Computer – Aided Drafting, McGraw-Hill Companies.
  - 3) George Omura with Brian C. Benton, Mastering Autocad 2014 And AutocadLT 2014, John Wiley & Sons, Inc., Indianapolis, Indiana.
-

<b>Course Title : Aesthetics And Visual Arts – II</b>	
<b>Course Code : 201AR112</b>	<b>Semester : II</b>
<b>Teaching Scheme : L-T-P : 1-0-2</b>	<b>Credits : 3</b>
<b>Evaluation Scheme : ISE Marks : 100</b>	<b>ESE Marks : --</b>

**Course Description:**

Aesthetics is a study and appreciation of beauty. The visual arts are art forms that are primarily visual in nature, such as drawing, painting, sculpture, ceramics, printmaking, conceptual art, design, crafts, ceramics, photography, video, film making, and architecture. Aesthetics is also experienced in many artistic disciplines such as music and performing arts. The course intends is to develop aesthetic sensitivity towards life as a whole including all art forms and Architecture in particular.

**Course Objectives:**

- 1) To develop proficiency in artistic orientation, artistic skills of students & to enhance their artistic sensitivity.
- 2) To enable to think graphically, practice to think in 3<sup>rd</sup> and 4<sup>th</sup> dimension.
- 3) To enable change in perception regarding good taste leading to clear vision and resulting in good design.
- 4) To understand the effect of human form, emotions & behavior affects on Architectural form and space.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

112.1	Apply rendering skills, graphical presentation skills to design assignments.
112.2	Appraise aesthetics in built environment of everyday life
112.3	Select principles of 3D composition for any given design assignment
112.4	Create architectural forms & spaces for simple human activities.

Prerequisite: Understanding and internalization of knowledge gained from Aesthetics And Visual Arts – I

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)  
And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
112.1	3	3	3	3	2	–	–	–	2	3	–	–	3	3	3,5
112.2	2	2	2	2	2	–	–	–	2	2	–	–	2	2	1,5
112.3	3	3	3	3	2	–	–	–	2	3	–	–	3	3	4,5,6
112.4	3	3	3	3	2	–	–	–	2	3	–	–	3	3	1,2,3

Contents	Hours
<b>Unit No. 1 –Rendering Skills</b> <ul style="list-style-type: none"> <li>• Introduction of rendering skills – Presentation of surface texture of materials like stone, timber, brick concrete, steel, glass, etc.</li> <li>• Graphical presentation- Rendering individual building plans, elevations and sections in different media showing shades and shadows</li> </ul>	6
<b>Unit No. 2 – Aesthetics in Architecture</b> <ul style="list-style-type: none"> <li>• Awareness about principles of good design, to develop good aesthetic taste.</li> <li>• Aesthetics in motion, sound, touch and smell</li> <li>• Aesthetics as part of mind</li> <li>• To enhance observation skills by conducting individual and group surveys, for example – how individual house forms with same built up area was developed differently in various geographical locations of country.</li> </ul>	6

<p><b>Unit No. 3 –Emotive value of Architectural forms &amp; spaces</b></p> <ul style="list-style-type: none"><li>• Study of emotive values of wall planes ,roof planes, and floor planes</li><li>• Understanding of forms and spaces in Architecture. 3D composition with group of 3D forms, play of solid and voids, vertical and horizontal juxtaposition.</li><li>• Study of Architectural textures, its effect on Architectural forms.</li></ul>	6
<p><b>Unit No. 4 - Responsive Architecture &amp; Responsible Architecture</b></p> <ul style="list-style-type: none"><li>• Introduction to the concept of Responsive Architecture - Phenomenon of perception –looking, listening, feeling and moving through Architecture- light and shade, fourth dimension in Architecture, Architecture as making frames.</li><li>• Introduction to the concept of Responsible Architecture – Environmental, Energy based, Sustainable design.</li></ul>	6
<p><b>Unit No. 5 – Form development for Architectural design</b></p> <ul style="list-style-type: none"><li>• Approach to Architecture design and space.</li><li>• Planning for simple activities (Architectural design assignment), form development for them.</li></ul>	6
<p><b>Unit No.6 – Art in Architecture</b></p> <ul style="list-style-type: none"><li>• Introducing art in architecture through painting, murals, sculptures, statuaries, mobiles, mosaics etc. Students may design above art forms for their Architectural design assignments</li></ul>	6

**Reference Books:**

- 1) Francis D.K. Ching, Architecture Form, Space and Order, John Miley and Sons.
- 2) Albert O Halse, Architectural Rendering, Mcgraw-Hill Book Company.
- 3) V. S. Pramara, Design Fundamentals In Architecture, Somaiya Publication Pvt. Ltd.
- 4) Francis D.K. Ching, Architectural Graphics, John Miley and Sons.
- 5) Francis D.K. Ching, Global History of Architecture, John Miley And Sons.
- 6) Teen Eiler Rasmussen, Experiencing Architecture, MIT press, 1964.

<b>Course Title : Architectural Graphics and Drawing - II</b>	
<b>Course Code : 201AR 113</b>	<b>Semester : II</b>
<b>Teaching Scheme : L-T-P : 1-0-2</b>	<b>Credits : 3</b>
<b>Evaluation Scheme : ISE Marks : 50</b>	<b>ESE (TH) Marks : 50</b>

**Course Description:**

Graphics is a language of expressing ideas. This course intends to develop graphical understanding and visualization of students to express their ideas through two dimensional and three dimensional sketches and drawings along with various presentation techniques. Graphics is basic course which supports all drawing based subjects of the program and enables students to understand basic principles like scale, proportion, graphical symbols, representation etc.

**Course Objectives:**

- 1) To understand objects graphically in 2 dimensional forms.
- 2) To develop an ability to analyze simple and complex objects graphically and represent them in orthographic projection methods.
- 3) To apply knowledge of orthography and represent objects in form of 3D views such as Isometric, Axonometric, Oblique.
- 4) To implement various graphical forms in their design ideas using different media and different rendering techniques.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

113.1	Represent objects graphically in two dimensional forms.
113.2	Analyze simple and complex objects graphically and represent them in orthographic projection methods.
113.3	Represent objects in form of 3D views such as Isometric, Axonometric, Oblique.
113.4	Implement various graphical forms in their design ideas using different media and different rendering techniques.

**Prerequisite:** Students should have an understanding of basic orthography projections.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)  
And Program Specific Outcomes (PSOs)**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
113.1	3	3	3	3	3	-	-	-	2	3	-	3	1	1	1,2
113.2	3	3	3	3	3	-	-	-	2	3	-	3	1	2	3,4
113.3	3	3	3	3	3	-	-	-	2	3	-	3	2	2	3,4
113.4	3	3	3	3	3	-	-	-	2	3	-	3	2	2	5,6

Contents	Hours
<b>Unit No. 1</b> Isometric, Axonometric and Oblique Views, including assignments of simple to complex objects and also cut and rotated objects	12
<b>Unit No. 2 -</b> Interpenetration of geometric solids, forms and section of solids, sectional elevations of objects and assignments based on same. Understanding of Architectural drawings with the help of case studies of drawings by famous Architects.	9
<b>Unit No. 3 –</b> Surface development of simple and complex objects .Learning to unfold different geometric shapes simple to complex with help of assignments and models.	9
<b>Unit No. 4 -</b> Application of subject Computer – I in Graphics –I. drafting simple objects to building plans in CAD, using the knowledge of orthography and basic CAD commands.	6

**Reference Books:**

- 1) N. Bartony, I. Chernov: Architectural Engineering, revised edition 1986, published by MIR Publishers Moscow.
  - 2) Keith Styles: Working Drawing handbook 2<sup>nd</sup> Edition 1986, published by McGraw-Hill
  - 3) H. Joseph and Morris: Practical plane and solid geometry
  - 4) Gill Robert: Rendering with pen and ink, Edition 2013, published by Affiliated East – West Press Private Limited.
  - 5) Thames and Hudson, London: Rendering with Pen and Ink, Published by Thames and Hudson 1981.
  - 6) Jax Themier, B.W., “How to Paint and Draw”, Thames and Hudson, 1985.
  - 7) M. G. Shah, C. M .Kale, S. Y. Patki : A Reference book of Building Drawing. 3<sup>rd</sup> edition published by McGraw-Hill 1997.
  - 8) The American Institute of Architects: Architectural Graphic Standards, 11<sup>th</sup> edition published by John Wiley and Sons.
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# D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

KASABA BAWADA, KOLHAPUR-416006

An Autonomous Institute

**F.Y B. Arch.**

Curriculum w.e.f. 2020-2021

Course Title : <b>Architectural Design - II</b>	
Course Code : <b>201AR114</b>	Semester : <b>II</b>
Teaching Scheme : L-T-P : 1-0-6	Credits : 7
Evaluation Scheme : ISE Marks : <b>100</b>	ESE (OE) Marks : <b>100</b>

### Course Description:

The course intends to develop an understanding of architectural design responses to site conditions and user's requirements depending on occupation, family lifestyle, religion etc. It also intends to explore the quality of architectural space. The course integrates sketching, model making and photography for design process.

### Course Objectives:

- 1) To study contemporary design practices of houses in town and urban contexts.
- 2) To explore effect of materials, color, texture, light on the quality of architectural space and form.
- 3) To explain the relationship between built forms open space and explore the connectivity between indoor and outdoor spaces.
- 4) To use architectural drawings as communication tool to convey design information.

### Course Outcomes (COs):

At the end of the course the student should be able to:

114.1	Analyze design practices of houses for various contexts for small scaled projects of human habitat.
114.2	Create the architectural spaces and forms using fundamentals of design for given architectural program.
114.3	Develop the connectivity between indoor and outdoor spaces.
114.4	Demonstrate Architectural drawings with the help of various rendering media and techniques.

Prerequisite: Internalization of knowledge gained in following subjects of Semester - I :-  
Architectural Design – I and Aesthetics and Visual Arts - I

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
114.1	3	2	2	-	-	2	2	-	2	-	-	-	-	-	4
114.2	3	2	2	-	-	2	2	-	2	-	-	-	-	-	6
114.3	3	2	2	-	-	2	2	-	2	-	-	-	3	-	6
114.4	3	2	2	-	-	2	2	-	2	-	-	-	-	2	3

Contents	Hours
<b>Unit No. 1 – Literature study on given project</b> <ul style="list-style-type: none"> <li>Literature studies for Spatial Interpretations – Movement, transformation, visual connections, linkages, volumetric relationships,</li> <li>Case studies on contemporary trends to know how various architects have responded to different contexts, for given project.</li> </ul>	7
<b>Unit No. 2 –Data collection on given assignment</b> <ul style="list-style-type: none"> <li>Principals of Design with reference to function, various activities and related spaces. Data collection, environment, climate, orientation, site conditions, circulation.</li> <li>Relationship of activities to space – Anthropometric data, circulation diagrams, deriving optimum areas.</li> </ul>	7
<b>Unit No. 3 – Report presentation</b> <ul style="list-style-type: none"> <li>Group work (Student’s team) for site visit, data collection ,analysis and report presentation of given site.</li> <li>Group work for physical case studies of assigned projects, data collection analysis and report presentation of the same .</li> </ul>	7



<b>Unit No. 4 – Evolving architectural forms</b> <ul style="list-style-type: none"><li>• Exploring 2 dimensional &amp; 3 dimensional aspect of Architectural form &amp; function for given project through extensive exercise of sketching &amp; model making in various media.</li></ul>	7
<b>Unit No. 5- Design</b> <ul style="list-style-type: none"><li>• Projects involving organization of multiples of single unit space with horizontal and vertical movement as well as single use public buildings of small scale</li><li>• Types of projects: House for myself, Farm house, Villa, Architect’s Office, Personal work spaces, Post office/ Taluka office etc- up to 80 to 100Sq.M.</li><li>• Detailing of any building element like staircase, skylight, courtyard, entrance lobby etc. of the project handled.</li></ul>	56

Note:

- a. Exercises related each unit has to be carried out distinctively.
- b. Relevant case studies and literature studies can be given by the studio teachers and report has to be compiled by the students.
- c. One of the design exercises can be carried out as group work to explore possibilities of students working as teams.
- d. Vertical studio involving other semesters can be encouraged to carry out one full or part project.
- e. The portfolio covering the above topics shall be presented for viva voce.
- f. Projects to be presented with help of drawings, sketches and models (study models and final models). Application of techniques learnt in visual arts and architectural graphics have to be incorporated.
- g. The projects listed in the syllabus is only to state the scale and complexity. The projects of similar scope can be introduced by the teachers.

**Reference Books:**

- 1) Joseph De Chiara, Time saver standards for building types – McGraw-Hill Inc., US; 3rd Revised edition.
- 2) Ernst Neufert, Neufert- architects data – Third edition, Wiley India Pvt Ltd.
- 3) Robert W. Gill, Rendering with Pen and Ink, Thames & Hudson.
- 4) D. K. Ching , Third edition - Form, Space & Order
- 5) Charles Harris, Time saver standards for landscape architecture, Second edition, McGraw Hill Education.
- 6) Wucius Wong, Principles of three imensional Design, Van Nostrand Reinhold NY.
- 7) Maier Manfred, Basic principles of Design, Van Nostrand Reinhold NY
- 8) Yatin Pandya - Elements of Space Making, Mapin Pub., 2007.
- 9) Ramsey and sleeper -Architectural Graphics Standards, John Wiley & Sons.



# D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

KASABA BAWADA, KOLHAPUR-416006

An Autonomous Institute

**F.Y B. Arch.**

Curriculum w.e.f. 2020-2021

Course Title : <b>Human Settlement &amp; History of Civilization - II</b>	
Course Code : <b>201AR115</b>	Semester : <b>II</b>
Teaching Scheme : L-T-P : 2-0-0	Credits : 2
Evaluation Scheme : ISE + MSE Marks : <b>20+30</b>	ESE (TH) Marks : <b>50</b>

### Course Description:

Human settlement & History of civilization is important for learning and understanding of different settlements, evolved in different parts of the world. It explains the relationship of man & settlement along with various aspects - socio-cultural, economic, climatic and geographic conditions. This course intends to develop an understanding of settlements and overall built environment.

### Course Objectives:

1. To study the settlements and the history of civilization from prehistoric period and ancient civilizations.
2. To understand the influence of geography, geology, climate, socio-climate and religious aspect of that particular place on settlement patterns and architectural built form.
3. To carry out comparative study of various civilizations.

### Course Outcomes (COs):

At the end of the course the student should be able to:

115.1	Understand and study the history of human settlements and civilizations from medieval period to modern period.
115.2	Analyze and study the development phases of civilization with reference to socio cultural, religion, climate geography and geological aspect.
115.3	Evaluate by making comparative study of various periods in civilizations.

Prerequisite: Knowledge of human settlements and their evolution in different civilizations from Pre-historic period.



**D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

**KASABA BAWADA, KOLHAPUR-416006**

**An Autonomous Institute**

**F.Y B. Arch.**

**Curriculum w.e.f. 2020-2021**

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
<b>115.1</b>	2	1	2	1	1	3	2	-	-	1	-	1	2	1	1,2
<b>115.2</b>	2	1	1	1	1	3	2	-	-	1	-	2	2	1	4
<b>115.3</b>	2	1	1	1	1	3	2	-	-	1	-	1	2	1	4,5

Contents	Hours
<b>Unit No. 1 – Medieval Period</b> Feudal system, Christianity and church, the Guilds, Human settlements, Dwellings, Town house, economic development, Architecture, Government, Crusades.	4
<b>Unit No. 2 - Renaissance</b> Meaning,, Factors responsible for renaissance, Renaissance in Art, Architecture and Literature, Human settlements, Baroque city, city of Raipur(Renaissance in India).	4
<b>Unit No. 3 – Industrial Revolution</b> Introduction, effects, factory town, Factory Town-settlements,	4
<b>Unit No. 4 – Different Movements after Industrial Revolution.</b> City Beautiful Movement, Garden city - Ebenezer Howard, Concept of satellite town, Concept of urban renewal.	4
<b>Unit No. 5 – City Development in Indian Context.</b> Salient features of Chandigarh city, Salient features of planning of Gandhinagar city	4
<b>Unit No.6 - Urban Renewal</b> Features of Urban renewal, Characteristics of Neighborhood unit, Radburn city concept, Ekistics and Dyna polis, polis metropolis, mega polis.	4



**D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

**KASABA BAWADA, KOLHAPUR-416006**

**An Autonomous Institute**

**F.Y B. Arch.**

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**Curriculum w.e.f. 2020-2021**

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**Text books:**

- 1) Abir Bandyopadhyay, Town Planning, Books & Allied Ltd.

**Reference Books:**

- 1) James Edgar Swain, A History of World Civilization, McGraw-Hill Book Company.
  - 2) H. A. Davies, An Outline History of The World, Read Books; Illustrated edition.
  - 3) G. K. Hiraskar, Fundamentals of Town Planning , Dhanpat Rai Publications
  - 4) The urban pattern – city planning and Design-Arthur B. Gallion FAIA Simon Eisner,AICP
  - 5) Sir Banister Fletcher's- A history of architecture - Revised by J. C. Palmes, New York : Scribner, 1975
  - 6) G. K. Hiraskar, The Great Ages Of World Architecture, Dhanpat Rai Publications.
  - 7) K. R. Thooyavan , Human settlement- A planning guide to beginners, Ma Publication
  - 8) Vedula V L N Murthy, Indian architecture, Standard Publishers Distributors.
-

Course Title : <b>Carpentry And Model Making Workshop – II</b>	
Course Code : <b>201AR116</b>	Semester : <b>II</b>
Teaching Scheme : L-T-P : 0-0-2	Credits : 2
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

**Course Description:**

This course offers an introduction of various materials, techniques used for architectural model making, basic concept of carpentry. It emphasizes the basic understanding of hands of experiment skills to create and presentation of two dimensional and three dimensional scaled models.

**Course Objectives:**

- 1) To introduce different materials such as wood, bamboo etc. and tools and techniques of architectural model making and basic processes for carpentry.
- 2) To demonstrate relationship of models with other courses like 'Design', 'Building Technology', 'Graphics', etc..
- 3) To give hands on skill experience of simple building material and construction Techniques.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

116.1	Prepare simple models using carpentry techniques.
116.2	Apply the knowledge of material and techniques used in process of two dimensional and three dimensional model making.
116.3	Create three dimensional scaled models.

**Prerequisite:** Knowledge of using simple model making materials, Properties of wood and bamboo.

**Assignments:**

Sufficient number of assignments to cover the topics with respect to other subjects like 'Design', 'Building Technology', 'Theory of Structure', 'Human settlement and History of Civilization' etc. with thrust on exploring maximum materials and techniques, understanding their appropriateness for the purpose and skill development.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
116.1	3	1	-	-	1	-	-	-	-	-	-	1	-	-	1,2
116.2	3	1	-	-	1	-	-	-	1	-	-	1	-	-	2,3
116.3	3	1	-	-	1	-	-	-	-	-	-	1	-	-	2,6

Contents	Hours
<b>Unit No. 1</b> Three dimensional objects – 3 Assignments to be done in group by using Timber, Bamboo and various techniques of carpentry work.	6
<b>Unit No. 2 -</b> Models based on Design projects- 2 Assignments to be done by using suitable materials and various model making techniques.	8
<b>Unit No. 3 –</b> Based on building technology- 5 Assignments to be done in group on given subject by using suitable material and techniques of model making and carpentry work.	4
<b>Unit No. 4 –</b> Visit any one practicing Architect firm, study one of residential project designed by him/her and prepare model for the same in suitable material and various model making techniques.	6

**Reference Books:**

- 1) John Taylor, Model Building for Architects and Engineers, McGraw Hill Co., NYC; 2nd ptg edition.
- 2) Janke Rolf, Architectural Models, Frederick A. Praeger, Inc., New York, New York, U.S.A. (1968).

Course Title : <b>Scope of Architecture - II</b>	
Course Code : <b>201AR117</b>	Semester : <b>II</b>
Teaching Scheme : L-T-P : 2-0-0	Credits : 2
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

**Course Description:**

The course intends to introduce technicalities of architecture through conceptual understanding of structural aspect, factors affecting architectural design, building services & typologies of architecture so as to develop perception of students towards architectural study.

**Course Objectives:**

1. To introduce various factors affecting architectural design.
2. To introduce role of various services in building construction.
3. To introduce various typologies of architecture.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

117.1	Describe various factors affecting architectural design.
117.2	Describe role of various services in building construction.
117.3	Interpret various architectural expressions.

**Prerequisite:** Basic understanding about profession of architecture.

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes (PSOs)**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
117.1	2	-	-	-	-	-	2	-	-	-	-	2	-	-	2
117.2	3	-	-	-	-	-	3	-	1	-	-	2	-	-	2
117.3	2	-	-	-	-	-	2	-	-	-	-	2	-	-	2

Contents	Hours
<b>Unit 1 – Introduction to structural aspect</b> Types of structure and structural techniques - Introduction to various structural systems, importance of structural aspect, Concept of structural and non structural building elements, their list.	6
<b>Unit 2 – Introduction to factors affecting architectural design</b> Elementary climatology -Climate as guiding factor for designing, Various climate zones – introduction, Selection of materials in response to climatic conditions, Buildings and environment, Effect of environment on buildings and effect of buildings on environment.	6
<b>Unit 3 – Introduction to building services</b> Various building services as integral part of design process, Functioning of buildings and services, importance of services planning, role of various services consultants in design process.	6
<b>Unit 4 – Introduction to typologies of architecture</b> Introduction to vernacular architecture -Definition, materials used, typical case studies, Introduction to rural architecture- Definition, impact of life style, materials used, typical case studies, Introduction to urban architecture - Definition, impact of life style, materials used, typical case studies	6

**Text Books:**

- 1) V. S. Pramdar, Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd. 1973.

**Reference Books:**

- 1) Anaxu Zabaibeasca, The Architect's Office, Gustavo Gili, Barcelona, 1996.
- 2) Kulbhushan Jain (Ed), Learning Architecture, AADI CENTRE, Ahmedabad, India, April 2019.
- 3) Christian Schittich, Vernacular Architecture,- Atlas For Living Throughout The World, Birkhauser, 2019.
- 4) Will Weber & Simos Yannas, Lessons From Vernacular Architecture, Ronledge Taylor & Group, London, 2014.



**D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

**KASABA BAWADA, KOLHAPUR-416006**

**An Autonomous Institute**

**F.Y B. Arch.**

**Curriculum w.e.f.2020-2021**

<b>Course Title : Building Construction and Materials – II</b>	
<b>Course Code : 201AR118</b>	<b>Semester : II</b>
<b>Teaching Scheme : L-T-P : 2-0-2</b>	<b>Credits : 4</b>
<b>Evaluation Scheme : ISE Marks : 100</b>	<b>ESE(OE+TH) Marks : 50+50</b>

**Course Description:**

This course offers an introduction to the building techniques, components, conventions, and an understanding of various types of basic building materials such as sand, lime, timber & bamboo, with different building types. It emphasizes the basic understanding of various structural components. behavior, its principles and application in construction technology.

**Course Objectives:**

- 1) To introduce building construction techniques, components, conventions and application of basic building materials sand, lime, timber & bamboo.
- 2) To help students in developing a clear understanding of the basic principles of construction and materials suitable for building components..
- 3) To encourage a mix of classroom work, field learning and hands on experiment.

**Course Outcomes (COs):**

At the end of the course the student should be able to:

118.1	Classify structural typology and building components.
118.2	Select suitable materials for buildings and adopt suitable construction techniques.
118.3	Apply knowledge of construction process for Supervise the construction of different building components based on suitability.

**Prerequisite:** Understanding of basic building components and their terminology.



**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes (PSOs)**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
107.1	3	2	2	-	-	2	2	-	2	-	-	-	-	-	1,2
107.2	3	2	2	-	-	2	2	-	2	-	-	-	-	-	2,3
107.3	3	2	2	-	-	2	2	-	2	-	-	-	3	-	2,3
107.1	3	2	2	-	-	2	2	-	2	-	-	-	-	-	1,2

Contents	Hours
<p><b>Unit: 1 Sand &amp; Lime Material:</b> Types of sand such as Pit, river sea sand, gravel their properties and use in building construction, bulkgage of sand. Lime ore stone, quarrying and collection composition and physical properties method of burning of lime ore, quick lime, fat lime, hydraulic lime mortar mix, method of preparation, neeru, plaster, efflorescence, peeling, flaking, blistering, use of surkhi, I.S.I. standards, lime wash, uses in construction.</p>	6
<p><b>Unit No. 2 – Arches, Lintels and Chajjas:</b> <b>Construction:</b> Terminology of arches, Types of Arches in basic materials such as stone, brick and their use. Construction techniques used for arches centering for Arch and stability of arches. Terminology of lintel, Types of Lintel in various material such as Brick, Wooden, Stone, Steel and RCC lintel and their use. Construction techniques used for lintel. Cornices, canopy and porch in brick and stones. <b>Case Study</b>-Field visit on Construction site and Report.</p>	10
<p><b>Unit No. 3 Timbers Material:</b> Introduction of timber derivatives, roofing materials for small span sloping roofs including Mangalore tiles with reference to their characteristics, market forms, applications and preservation, etc.</p>	12



<p><b>Construction:</b> <b>Doors and windows:</b> - Terminology of Doors and windows. Types of Doors such as ledged, braced, battened, False Panelled door, Flush door, and simple glazed and wooden panelled. Various types of windows with respect to function, Details of T. W. Window. <b>Case Study-Field visit on Construction site and Report.</b></p>	
<p><b>Unit No. 4 Roof</b> <b>Roof:</b> - Terminology of timber roof. Types of simple pitched roof such as lean-to, couple, close couple and, collar beam roof, king post, queen post and their functions with respect to span. Material and details of roof covering such as Thatch, Mangalore and other patent tiles country tiles and shingles. <b>Case Study-Field visit on Construction site and Report.</b></p>	10
<p><b>Unit No. 5 Timber floor</b> <b>Timber floor:</b> - Types of timber floor such as Single and double floor construction, its Terminology and function. <b>Case Study-Field visit on Construction site and Report.</b></p>	10

#### Sessional Work

Hand drawn drawings on Units 2 to 5; Assignments on units 1, to 5

#### Reference Books:

- 1) K.S.Rangwala. A reference book of Engineering Materials, Charotar Publishing House Pvt. Ltd.,34<sup>th</sup> Edition(2007)
- 2) B.K.Agarwal. A reference book of Engineering Materials,Tata McGraw Hills Publishing, (2010)
- 3) S.K.Duggal. A reference book of Building Materials, New Age International Publishers, 3<sup>rd</sup> Revised Edition: (2011)
- 4) RoyChudley & Roger Greeno. A reference book of Building Construction Handbook, Elsevier Ltd Publishing,8<sup>th</sup> Edition(2010)
- 5) Sushil Kumar. A reference book of Building Construction,A.K.Jain Publishing, 20<sup>th</sup> Edition(2010)
- 6) Roy Chudley. A reference book of Construction Technology, Pearson India Education Services Pvt. Ltd. Publishing, 2<sup>nd</sup> Edition(2015)
- 7) W.B.Mackay. A reference book of Building Construction, Pearson India Education Services Pvt. Ltd. Publishing, 5<sup>th</sup> Edition(Metric)(2013)
- 8) S.C.Rangwala A reference book of Building Construction,Pradipkumar R. Patel Publishing, 31<sup>st</sup> Edition(2013)
- 9) Dr. B.C.Punmia, Er. Ashok Kumar Jain & Dr. Arun Kumar Jain. A reference book of Building Construction, Laxmi Publication Pvt.Ltd., 10<sup>th</sup> Edition (2009)



# D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

KASABA BAWADA, KOLHAPUR-416006

An Autonomous Institute

**F.Y B. Arch.**

Curriculum w.e.f.2020-2021

Course Title : <b>Basics of Structural Engineering For Architecture - II</b>	
Course Code : <b>201AR119</b>	Semester : <b>II</b>
Teaching Scheme : L-T-P : 3-0-0	Credits : 3
Evaluation Scheme : ISE + MSE Marks : <b>20+30</b>	ESE (TH) Marks : <b>50</b>

### Course Description:

This subject brings the architectural imagination from paper to the ground in reality. It provides thorough knowledge of various loads acting on structure, behavior of structure and structural strengths of various building materials. This knowledge will help the students to select the proper structural system with appropriate materials as per the required circumstances. This subject helps students to make their designs structurally feasible.

### Course Objectives:

- 1) To introduce different roofing systems according to span of the structure.
- 2) To introduce the concept of composite material, center of gravity, moment of inertia.
- 3) To introduce analysis method for beams.
- 4) To take structural engineering to exerted level of art.

### Course Outcomes (COs):

At the end of the course the student should be able to:

119.1	Predict the effect of different roofing system
119.2	Analyze the behavior of member under load.
119.3	Draw shear force diagram and bending moment diagram.
119.4	Develop an aesthetical attitude towards structural engineering.

Prerequisite: Basic knowledge of Hooks Law, stress, strain and elasticity.



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**KASABA BAWADA, KOLHAPUR-416006**

**An Autonomous Institute**

**F.Y B. Arch.**

**Curriculum w.e.f.2020-2021**

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
<b>119.1</b>	1	2	2	2	2	2	2	2	2	-	-	-		-	1,2
<b>119.2</b>	2	3	3	3	3	2	2	2	2	-	-	-		-	2,3
<b>119.3</b>	2	2	2	2	2	1	1	1	1	-	-	-		2	1,2
<b>119.4</b>	2	3	3	3	3	2	2	2	2	-	-	-		2	2,3

Contents	Hours
<p><b>Unit No. 1 Overview of various types of roofing systems</b> Introduction of Trusses as Building Elements and its importance. Perfect and imperfect frames redundant member. Types of trusses and application of industrial building .Analytical Solution-Method of Joints Vaults and domes of various spans, various types of shell structure, space frames in steel used for large spans. Various configurations in R.C.C. slab. Case study relevant to above systems.</p>	10
<p><b>Unit No. 2 –Simple stresses and strains</b> Linear stresses and strains, Hooke’s law, stress strain curve, lateral strain, Poisson’s ratio and elongation of long rods, different types of safe stress as per IS code. Properties like elasticity, plasticity, brittleness and ductility for common materials like steel, wood, concrete, glass, bricks. Volumetric strain, shear stress, modular ratio. Composite material.(simple problems to study load distribution in composite material and its behavior).</p>	6
<p><b>Unit No. 3 - Properties of Section</b> Centre of gravity, radius of gyration, symmetrical and unsymmetrical sections including Built-up section. Moment of Inertia, Modulus of section. Study report of one historical building based on application of knowledge of structural system, load acting on structure, material used according to their properties, what changes if constructed now? Simple sums on C.G. and M.I.</p>	10
<p><b>Unit No. 4–Bending moment and shear force.</b> Evolution of concept of span from architectural history temples in Egypt, Greece, south India, Indo-Aryan. Concept of shear stress and Bending moment. SFD and BMD for simply supported beam with point load and UDL, cantilever beam with point load and UDL. Simple problems on above to study beam behavior.</p>	10



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**Curriculum w.e.f.2020-2021**

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**Sessional Work**

Minimum 4 assignments based on above topics.

**Text Books:**

1) R. S. khurmi, Engineering Mechanics, S. Chand.

**Reference Books:**

- 1) RK Bansal and Sanjay Bansal, Engineering Mechanics, Laxmi publications, New Delhi.
  - 2) F.L. Singer, Engineering Mechanics, Harper Collins publications.
  - 3) Curt Siegel, Sturcture and form in modern architecture, Crosby Lockwood And Son Ltd.
  - 4) Alan Holgate, The art in structural design, Oxford University Press, New York.
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# D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

KASABA BAWADA, KOLHAPUR-416006

An Autonomous Institute

**F.Y B. Arch.**

Curriculum w.e.f.2020-2021

Course Title : <b>Literary and Communication Skills in Architecture – II</b>	
Course Code : <b>201AR120</b>	Semester : <b>II</b>
Teaching Scheme : L-T-P : 2-0-0	Credits : 2
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

### Course Description:

The course will orient students towards the understandings of literature related to architecture and allied fields through book reading, understanding contents, deriving abstract and writing about their learning outcomes. The course also intends to develop skills to present their learning outcomes effectively.

### Course Objectives:

- 1) To explore the relationship between architectural discourse and architectural communication.
- 2) To understand the intersection of allied fields of architectural communication.
- 3) To apply communication techniques and skills learnt in creative manner.

### Course Outcomes (COs):

At the end of the course the student should be able to:

120.1	Understand the importance of digital communication into architecture.
120.2	Analyze a research paper, summarize and express learning outcomes through literary medium.
120.3	Present himself /herself efficiently singly and through group presentations.
120.4	Letter writing (Formal), Applying for Job, Resume Preparation.

Prerequisite: Basic grammatical knowledge.



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**F.Y B. Arch.**

Curriculum w.e.f.2020-2021

## Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
120.1	3	2	-	-	1	-	-	1	3	3	-	-	-	-	2
120.2	3	2	-	-	1	-	-	1	3	3	-	-	-	2	2,4
120.3	3	2	-	-	1	-	-	1	3	3	-	-	-	-	2,3
120.4	3	2	-	-	1	-	-	1	3	3	-	-	-	2	2,3

Contents	Hours
<b>Unit No. 1 – Reading skills</b> Reading a paper related to the topic dealt in Book reading ,deriving an abstract from the paper, discussions and debate on the learning's from the paper.	6
<b>Unit No. 2 – Presentation and Technical skills</b> Technical Group discussions, Paper presentation in a forum, Debate, Role play of an Architect. Office Drafting- Notices, Meeting agenda, Minutes of meeting.	8
<b>Unit No. 3 Career skills</b> Job application, Appearing for an interview. Organizing a speech-Voice modulation, Gestures, Appearance, Body language etc.	6
<b>Unit No. 4 - Graphical Presentation skills</b> Preparing power point presentations, Graphical models (sketching, 3D views).	4

### Sessional Work

Minimum 5 assignments based on above topics.



**D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

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**An Autonomous Institute**

**F.Y B. Arch.**

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**Curriculum w.e.f.2020-2021**

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**Reference Books:**

- 1) Ajmani.J.C – Good English: Getting it right, Rupa & Co.
  - 2) Hasson Gill – Brilliant communication skills, Pearson Education India; first edition
  - 3) Raman, Meenakshi and Sangeeta Sharma – Technical communication principles and practice, Oxford University Press.
  - 4) Rob Biesenbach – Unleash the power of storytelling-win hearts, change minds and get results, Eastlawn Media
  - 5) Jain,Bhatia and Sheikh – Professional communication skills, S. Chand Publishing.
  - 6) Mohan & Meera Banerji – Developing communication skills, Laxmi Publications.
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# D.Y.PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

KASABA BAWADA, KOLHAPUR-416006

An Autonomous Institute

**F.Y B. Arch.**

Curriculum w.e.f. 2020-2021

Course Title : <b>Computer Technology in Architecture -II</b>	
Course Code : <b>201AR121</b>	Semester : <b>II</b>
Teaching Scheme : L-T-P : 0-0-2	Credits : 2
Evaluation Scheme : ISE Marks : <b>50</b>	ESE Marks : --

### Course Description:

Architecture is always expressed through drawing mode and maintains a close relationship to the mode and techniques of representation. The content of course discusses the basic introduction of the computer softwares required for the architectural presentation. Course offers an opportunity to be at the forefront of the emergent practice of digital era. Using various softwares & techniques, an Architecture student can perform their project designs spending less energy-time but more realistic.

### Course Objectives:

1. To teach them to create 3D modeling ,required to make a clear understanding from all sides of building
2. To develop creative ideas using different rendering techniques
3. To teach word processing software to write specifications, proposals and other documents.

### Course Outcomes (COs):

At the end of the course the student should be able to:

121.1	Apply technical knowledge of computer software in the academic work
121.2	Analyze 3D software to learn design development
121.3	Apply advanced skills which will help them to use in daily design and rendering work
121.4	Create documentation using different technologies and apply in the competitive world which makes their work easier & faster

Prerequisite: Architectural Graphics

**Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) And Program Specific Outcomes ( PSOs )**

Course Outcomes (COs) / Program Outcomes (POs) / Program Specific Outcomes (PSOs)	1	2	3	4	5	6	7	8	9	10	11	12	(PSOs)		B T L
													1	2	
121.1	1	-	1	-	3	1	-	1	-	1	1	1	-	-	1,2
121.2	1	-	1	-	3	1	-	1	-	1	-	1	-	1	4
121.3	1	2	1	2	3	1	-	1	2	1	1	2	1	1	3
121.4	1	1	1	-	3	1	-	1	-	2	-	1	-	-	3,6

Contents	Hours
<b>Unit No. 1 –Introduction to 3D Drafting</b> Concept of 3D modeling, Introduction to 3D digital modeling. Concept of UCS and viewports in 3D.	2
<b>Unit No. 2 – 3D</b> Learning basic 3D drawing and edit commands. Drafting different geometric shapes and their combinations. Using different commands like rotate, slice, orbit etc. on these shapes.	6
<b>Unit No. 3</b> Drafting 3D of building plan of previous semester's Design assignment.	4
<b>Unit No. 4</b> Study shades and shadows of 3D digital models with different perspective views.	4
<b>Unit No. 5</b> Introduction to Shading & Rendering. Rendering of Plans, sections, elevation, perspectives using Symbol Library.	6
<b>Unit No. 6</b> Output of the presentation drawing through printer or plotters.	2



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**Curriculum w.e.f. 2020-2021**

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**Sessional work**

One 3D project of residence ( min 2BHK ) with rendering & sciography

**Reference books:**

- 1) Jon.A.Bell, 3d studio max R3- special effects & design, Coriolis Group
  - 2) Kenneth .J.L.Segal/ Charles.A.Petra/ George.O.Head, The Autocad 3D, Tewi Verlag.
  - 3) Voisinet, Introduction To Computer – Aided Drafting, McGraw-Hill Companies.
-



**( For Sem.- I )**

## **Democracy, Elections and Good Governance**

**(Non Credit Mandatory Course)**

### **• Democracy in India**

- Dimensions of Democracy: Social, Economic and Political
- Decentralisation: Grassroots Level Democracy
- Challenges before Democracy: women and marginalised sections of the society

### **• Election to Local Self Government Bodies**

- 73rd and 74th Constitutional Amendment Acts: Institutions at the local level and Role of State Election commission
- Local Body Elections: Urban & Rural
- Duties of an Individual towards electoral process

## • Good Governance

- Meaning and concept
- Government and Governance
- Good Governance initiatives in India

*Rationale: the rationale of the study is to make the pupils aware of the importance of democracy. What constitute democracy, what is its importance from the point of view of the role of individual and what exactly can a individual get if he performs his role well in the society. This module also aims to make the individual understand the different aspects of democracy and its implications in the overall development of the state. The syllabus is introduced from the point of view that all students upon entering into the college, enroll themselves as voters and encourage and enthuse other members of the society to participate not only in election process but also electoral and political process in general.*

## I. Democracy

### A. Introduction

Democracy is derived from the Greek word *Krates* ' meaning power or rule. Democracy thus means rule of the demos (the demos refereeing to the people, although the Greeks originally used this to mean the 'poor' or the 'many'. Thus democracy essentially links to the govt to the people and hence Abhram Lincon's famous definition of "Democracy is government of the people, by the people and for the people" rightly expresses the spirit of democracy.

Very broadly, democracy may mean the following

1. The system of rule by the poor and disadvantaged.
2. A form of government in which the people rule themselves directly and without the need for professional politicians or public officials.
3. A society based on equal opportunity and individual merit rather than hierarchy and privileges.
4. A system of welfare and redistribution aimed at narrow social inequalities.
5. A system of decision making based on the Principe of majority rule

6. A system of rule that secures the right and interests of minorities by placing checks upon the power of the majority.
7. A means of filling public offices through a competitive struggle for the popular vote.
8. A system of government that serves the interest of people regardless of their participation in political life.

### **Democracy is broadly classified as:**

Direct Democracy and

Representative Democracy

Direct Democracy is also called as participatory democracy this was the first ever model of democracy introduced in the Greek city state of Athens in 3rd century BC. In this form of democracy, citizens participated in the affairs of the state directly and had a say in the governance of the city state. Every citizen had a political right in theism state. (women and slaves were not allowed to participate).

Direct democracy thus obliterates the distinction between government and the governed and between the state and civil society.

### **Features of Direct Democracy**

It heightens the control that citizens can exercise over their own destinies as it is the only pure form of government.

It creates a better informed and more politically sophisticated citizens.

It enables the public to express their own views and interests without having to rely in self-serving politicians.

### **Representative Democracy**

It is also called limited or indirect democracy. The narrow meaning of representative democracy as understood by many is periodic voting after a stipulated time (in case of India it is every five years). However the larger meaning of democracy is full participation in the day to day affairs of governance. The process of election is essentially to establish a link between the government and the governed.

### **Features of representative democracy:**

It is a practicable form of democracy.

It relieves ordinary citizens the burden of decision making thus possible a division of labour in politics.

It allows governed to be placed in the hands of those with better education, expert knowledge and greater experience.

### **Principles of Democracy are as follows**

1. **Government by consent:** democracy is government by consent of the people. Rational consent can be obtained by persuasion for which an atmosphere of free discussion is essential. Consent is obtained at two levels.

A) Among the representatives of the people in the legislative assemblies where members of the opposition have their full say and

B) At a public level where there is a direct communication between the leadership and the people.

2. **Public Accountability:** It essentially means the representatives must remain answerable to the people. As we have seen earlier that democracy essentially is based on public consent, therefore it is implied that the government should be responsible and responsive to the people. Whatever will and aspirations of the people are, the government should attempt to fulfil/realise those if they fall well within the constitutional framework of the country.

3. **Majority Rule:** In modern representative democracies, decisions are taken in several bodies right from electing the government to the committees that are constituted. It is considered to be the heart of the democratic system that all issues in all the bodies from legislature to cabinet, executives and other committees are resolved through majority decisions. Political equality is secured by the principle of 'one man on vote', which implies that there will be no privileged sections claiming special weightage nor any underprivileged section whose voice is ignored. No discrimination is allowed on grounds of religion, race, Caste, Sex, Place of birth or ownership of property. The principles of majority rule relies on the wisdom of the Majority.

**BOX1: Popular Sovereignty:**

It means people's rule. The authority of the State and government is created and sustained by the consent of its people, through their elected representatives.

It means people are supreme authority and not the elected representatives.

4. **Constitutional government and Rule of Law:** Constitutional government means 'government by law' rather than by men. Democracy requires an infinitely complex machinery of process, procedures and institutions to translate the majority will into action. If one compromises with the law, rampant corruption and decay of democracy is ensured. It is, therefore, essential to have a well-established tradition of law and constitution for the stability of a democratic government.

**Box 2: Constitutional Supremacy**

As the rule book the constitution is supreme and not the Parliament. The laws emanating from the constitution should supersede all laws caste, sex, place of birth or ownership of property. The principle of majority rule relies on the wisdom of the majority.

**II. Dimensions of Democracy: Social Democracy, Economic and Political**

**Definition** a democratic welfare state that incorporates both capitalist and socialist practices.

**Meaning:** Social Democracy is a political, social and economic ideology that supports economic and social interventions to promote social justice within the framework of a capitalist economy, as well as a policy regime involving a commitment to representative democracy, measures for income redistribution, and regulation of the economy in the general interest and welfare state provisions. Social democracy thus aims to create the conditions for capitalism to lead to greater democratic, egalitarian and solidaristic outcomes; and is often associated with the set of socioeconomic policies that became prominent in Northern and Western Europe. In India Dr. B.R Ambedkar the Chairman of the Drafting Committee of the Constitution strongly advocated for Social Democracy.

**Core values of Social Democracy are as follows.**

1. **Freedom, Equality and Fraternity:** This was the battle-cry of the French Revolution; and these broadly remain the core values of democratic parties today. The formulation of core values began in the nineteenth century with the rise of the bourgeoisie and they began to conquer the world at the latest in the mid-twentieth century – they came to be the standard by which states and societies were judged.

2. **This is also reflected in the legal foundations of the United Nations.** With the UN's two Human Rights Covenants of 1966 the fundamental civic, political, economic, social and cultural rights attained the apex of their legitimacy and have been ratified by almost every country in the world. They constitute something like a global legal foundation. Fundamental rights are supposed to ensure the transposition of core values into formal legal claims.

3. **Fundamental Rights:** These are the rights enshrined in the constitutions of democratic countries. These are claims that individuals have in a state. In India, Fundamental Rights are enshrined in Part III of the constitution. If the fundamental rights are abridged by any individual or the state, any citizen can move the Supreme Court or the High courts.

**BOX 2: Six Fundamental Rights:**

Right to equality  
 Right to freedom  
 Right against exploitation  
 Right to freedom of religion  
 Educational and cultural right  
 Right to constitutional remedies

**Economic democracy** or stakeholder democracy is a socioeconomic philosophy that proposes to shift decision-making power from corporate managers and corporate shareholders to a larger group of public stakeholders that includes workers, customers, suppliers, neighbours and the broader public. No single definition or approach encompasses economic democracy, but most proponents claim that modern property relations externalize costs, subordinate the general well-being to private profit, and deny the polity a democratic voice in economic policy decisions. In addition to these moral concerns, economic democracy

makes practical claims, such as that it can compensate for capitalism's inherent effective demand gap.

**Political Democracy** is a means for the people to choose their leaders and to hold their leaders accountable for their policies and their conduct in office. The people decide who will represent them in parliament, and who will head the government at the national and local levels. They do so by choosing between competing parties in regular, free and fair elections. Government is based on the consent of the governed. In a democracy, the people are sovereign—they are the highest form of political authority. Power flows from the people to the leaders of government, who hold power only temporarily. Political Democracy is a means for the people to choose their leaders and to hold their leaders accountable for their policies and their conduct in office. The people decide who will represent them in parliament, and who will head the government at the national and local levels. They do so by choosing between competing parties in regular, free and fair elections. Government is based on the consent of the governed. In a democracy, the people are sovereign—they are the highest form of political authority. Power flows from the people to the leaders of government, who hold power only temporarily.

### **B. Decentralisation:**

Decentralisation can be usefully understood as a political process whereby administrative authority, public resources and responsibilities are transferred from central government agencies to lower-level organs of government or to non-governmental bodies, such as community-based organisations (CBOs), 'third party' non-governmental organisations (NGOs) or private sector actors

In 1993, the Government of India passed a series of constitutional reforms, which were intended to empower and democratise India's rural representative bodies – the Panchayats. The 73rd Amendment to the Constitution formally recognised a third tier of government at the sub-State level, thereby creating the legal conditions for local self-rule – or Panchayati Raj. Since this time, the process of decentralisation has been highly variable, ranging from ambitious attempts at Gram Swaraj (or village self-rule).

**Box 3: Political, administrative and fiscal decentralisation.**

Political decentralisation transfers policy and legislative powers from central government to autonomous, lower-level assemblies and local councils that have been democratically elected by their constituencies.

Administrative decentralisation places planning and implementation responsibility in the hands of locally situated civil servants and these local civil servants are under the jurisdiction of elected local governments.

Fiscal decentralisation accords substantial revenue and expenditure authority to intermediate and local governments.

**Source:** World Bank

**Defining features of Decentralisation:**

popular control of policy makers, both by regular elections and by the pressure of social interest groups;

the institutionalisation of all adult citizens in voting (i.e. one person, one vote);

political freedom in the eyes of the state;

policy decisions made on the basis of majority rule

**What makes local institutions accountable?**

In this section, we consider three broad conditions under which local institutions can be made more accountable to poor and politically marginal groups:

an active citizenry, whose participation in broad areas of political life, such as voting, campaigning, attending meetings, running for office, lobbying representatives, etc., serves to counter balance the arbitrary use of power;

fiscal and political support from higher level authorities within government;

the existence of competitive political parties whose legitimacy depends at least in part on the ability to support the needs of the poor.

### **C. Challenges before Democracy**

The basic challenges before democracy in India are poverty, illiteracy, lower participation, criminalisation of politics, political violence, corruption, communalism, Regionalism. Apart from this the two very crucial areas of (non)participation are women and marginalised sections.

#### **Women**

After family, patriarchy exists most in politics. Women are always considered to be the secondary citizens of the country. Hence, the opportunities for participation are minimal to them. In most cases they do not even have the right to select their own candidates and are often forced to vote for a candidate who the head of the family (generally male) asks to. If at all women come out to vote during various elections from parliamentary to state legislature to the local bodies of Municipal corporations, municipal councils, the zilla-parishads to panchayat samities to the gram panchayat, the turnout is generally very low. As regards contesting elections women though 33% reservation is available very few women volunteer for the same. As the posts are reserved the political families or the male members of the family operate from behind the curtain.

#### **Marginalised population:**

As regards the marginalised sections (the dalits, the tribals, casual workers, fisher folks, construction, migrated and labour, the voting percentage is very low. The government machinery cannot all the time attempt to bring them to the main stream. Hence community initiatives are most needed in this sphere. These marginalised groups are not even registered voters and hence a large number of people are out of the fray of election and in turn democratic process. It is therefore imperative to bring these people into the political sphere of the country.

## **II. Elections to Local Self Government Bodies:**

India is considered as one of the largest functional democracy in the world.

This democratic

Experiment has withstood the test of the time. It has been possible because we have been able to conduct free and fair elections at regular intervals (Except during 1976 Emergency). The constitution of India guarantees its people the right to choose their representatives and people who govern them. This takes place through elections at following three levels:

**National Level:** At this level people directly elect their representatives to the House of People i.e. Lok Sabha for a period of five years. The person elected thus is a representative of that particular area or constituency in the parliament. E.g. Lok Sabha has 543 members which are directly elected by the people through the first past the post system. People cast their votes for candidates belonging to a variety of political parties. The one who secures the highest number of votes is declared elected. Members of the Council of States i.e. Rajya Sabha are indirectly elected by members of Lok Sabha and members of the state legislative assembly.

**State Level:** The parliamentary form of government has been adopted at the state level as well. At this level people of a particular state directly elect their representatives to the state legislative Assembly i.e. Vidhan Sabha for a period of five years. The person elected thus is a representative of a particular area or constituency from a state in the state legislature. E.g. State legislature of Maharashtra has 288 members in the Vidhan Sabha which are directly elected by the people of the state of Maharashtra.

**Local Level:** In order to achieve ideals of good governance the constitution of India since 1990's has added one more tier to the government, in the form of local self-governing bodies, both in rural and urban areas. In this part of the chapter we shall go into details of Urban and Rural Local Body Elections.

### **Institutions at the Local Level:**

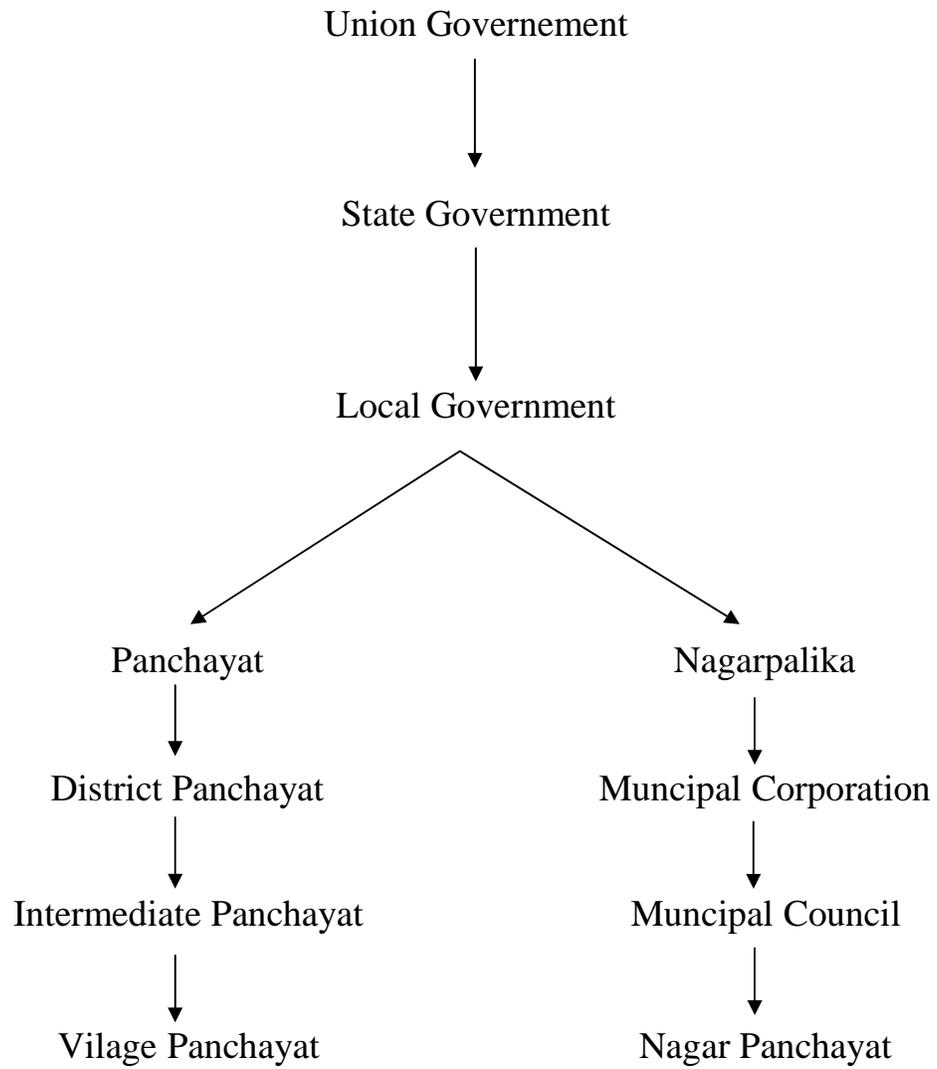
The geographical length and breadth of our country coupled with unimaginable socio-cultural diversity makes her a unique nation state. In addition to this a huge population poses many governance challenges before us. Our constitution has divided the powers and functions between the union and state in the form of three lists mentioned in part VII of the constitution. But with changing times and growing expanse of governance,

it was realised that a government is needed which closer to people, where people are part of the governing process and also a part of electing their own local representatives to address their local problems and concerns. To this effect in 1993 two historic constitutional amendments were passed by the Indian Parliament. The 73rd CAA and 74th CAA celebrate the spirit of local democracy and local governance in India.

### **Constitutional Provisions of the 73rd & 74th Constitutional Amendment Acts:**

The 73rd and 74th Amendment to the Constitution of India has given legal sanctity to the Panchayat Raj System in rural arrears and Municipal Governance in Urban areas. India has a chequered history of local self-governing bodies working at the local level. The council of five elderly members from a village i.e. Panchayat existed in India since time immemorial. Sir Charles Metcalf called these village communities as ‘Little Republics’. But with the passage of time these communities became dysfunctional. After independence, through the recommendations of various committees like Balwant Rai Mehata Committee, Ashok Mehta committee and others, Indian government tried to revive these institutions. But unfortunately they all failed miserably. However with the onsets of liberal reforms in 1990’s , the process of decentralisation also gained momentum. And finally in 1993 73rd and 74th CAA were passed by the Indian Parliament. These acts implement Article 40 of the DPSP. It added Part XI and XI A to the constitution. It covers Article 243 to 243 O which relates to Panchayati Raj System in rural areas and Article 243 P to 243 ZG which relates to urban local governance in India. These acts also added two schedules to the constitution, namely 11th and 12th schedule. The 11th schedule prescribes a list of 29 functions to be performed by rural local bodies and 12th schedule prescribes a list of 18 functions to be performed by the urban local bodies.

These two acts have added third tier to the federal framework of our Government and thus it makes India a unique three tier federal democratic polity in the world. The following flow chart explains this:



## **Important features of the 73rd and 74th Constitutional Amendment Acts:**

1) **Gram Sabha or Ward Sabha (Meetings) :** It is a deliberative body at the grassroots level. It comprises of all the registered voters in a village in rural areas or a ward in an urban area. It is the foundation of local democracy and process of decentralisation of powers in India. People at grassroots level can directly participate in the meetings of Gram Sabha or Ward Meeting, where they can discuss issues concerning them, offer suggestions, question their representatives and also approve the plans and budgets prepared by their representatives. In a way it's a miniature of the parliament of India at the grassroots level.

2) **Reservation of seats for SC/ St and Women:** In order to provide fair and equal representation to all the sections of the society, seats are reserved for SC, ST in proportion to their population. Along with this, one third seats are also reserved for women candidates. States like Maharashtra, Madhya Pradesh, Gujarat now reserve fifty per cent of the seats in their Panchayati raj institutions.

3) **State Election Commission:** This amendment provides for the establishment of the State Election Commission for conduct of elections to the urban and rural local self-government. This consist of Municipal Corporations, Municipal Councils, Nagar Panchayats in urban areas and Zilla Parishads, Panchayat Samitis, Village Panchayats in rural areas. This amendment made provision of Article 243-K and 243-ZA wherein State Election Commission were established. The main objective for 73rd and 74th amendment and making this provision was to create independent status of State Election Commission so that elections are conducted in free and fair, without other intervention.

### **Role of an individual towards electoral process at the local level:**

Democracy as a system and as a way of life becomes meaningful only when there is active participation of people in the electoral process. Following suggested activities help us understand our role as a citizen and as an individual in the electoral process.

**Suggested Activities:**

- 1) Find out the name of elected local representative from your rural or urban area in which you live. What promises he made at the time of election and how much work he had done in your area?
- 2) Register yourself in the voters list of your area of residence, to be able vote at the time of National, State or local Elections. If you shift your residence then you also must shift your name to the voters list of that area. Voter registration can now be done online as well.
- 3) Visit a Local body. E.g. Gram Panchayat or Municipal Corporation or Zilla Parishad
- 4) Attend a Gram Sabha or Ward Meeting in your own area.
- 5) Find out what functions rural or urban local bodies are supposed to perform in your Area.
- 6) Find out what are the problems, challenges and concerns of your area. What steps local body has taken to address the same?
- 7) Find out the names of political parties which contested election in your area last time. What was their electoral manifesto or agenda? How far the party has been able to address the local concerns? What is their party ideology? What is their party symbol?

### **III. Good Governance**

#### **Introduction:**

Governance has been defined to refer to structures and processes that are designed to ensure accountability, transparency, responsiveness, rule of law, stability, equity and inclusiveness, empowerment and broad based participation. When a government sticks to these principles while making policies and implementing them, it is said to be good governance.

Let us now look at the concept of Good Governance in detail.

#### **Meaning of Good Governance:**

In 1989, the concept of ‘governance’ was for the first time highlighted in a World Bank study ‘Sub-Saharan Africa-from Crisis to Sustainable Growth’ to describe the need for institutional reform and a better and more efficient public sector in Sub-Saharan countries. The study report mentioned four key dimensions of good governance:

- i. Public sector management
- ii. Accountability
- iii. Legal framework for development
- iv. Information and transparency

For a country like India where democracy forms the base of all the governing systems, governance needs to be inclusive and is largely determined by the participation of its people. In a democracy like ours, a system of governance which is accountable and transparent demands the participation of people at every level. People’s participation on one hand can help the government formulate better policies which can be communicated to the society again through participation and also implemented well with its help.

If policies of the government are inclusive and people friendly, it would help encourage the participation of citizens in the mainstream political process. In turn, when people participate directly- by contesting or indirectly by voting or by being a part of the electoral process, it would help strengthen the government and would help in bringing more people friendly policies.

Good governance thus has to be understood as a two way process- the government should ensure that the values of good governance like accountability and transparency are taken care of while framing policies while on the other hand, people should participate in the process of governance to make it better.

**After having a detailed discussion about the origin, development and meaning of good governance, let us try to understand the essential components of good governance reflected in the various documents and study reports of international organisations, policy makers and in the writings of the researchers and academicians.**

### **Characteristics of Good Governance:**

#### **1. Participation:**

The first characteristic refers to equal participation by all members of society as the key element of good governance, with everyone having a role in the process of decision-making. Participation could be either direct or through legitimate intermediate institutions or representatives. Participation needs to be informed and organized. This means freedom of association and expression on the one hand and an organized civil society on the other hand. All the section of society should be allowed to express their concerns in the policy making influencing them without any fear and discrimination.

#### **2. Rule of Law:**

Good governance requires fair legal frameworks that are enforced impartially. It also requires full protection of human rights, particularly those of minorities. Impartial enforcement of laws requires an independent judiciary and an impartial and incorruptible police force. It also involves provision of free legal aid to the poor and needy people who cannot afford to pay to the legal practitioner. It focuses on judicial and legislative reforms and the importance of legal education and training.

### **3. Transparency:**

Transparency means that decisions taken and their enforcement are done in a manner that follows rules and regulations. It also means that information is freely available and directly accessible to those who will be affected by such decisions and their enforcement. It also means that enough information is provided and that it is provided in easily understandable forms and media.

### **4. Responsiveness:**

Good governance requires that institutions and processes try to serve all stakeholders within a reasonable timeframe. By being responsive, governmental institutions gain legitimacy in the public realm which will automatically ensure their wider acceptance and thus effectiveness in governance.

### **5. Consensus oriented:**

There are several actors and as many viewpoints in a given society. Good governance requires mediation of the different interests in society to reach a broad consensus in society on what is in the best interest of the whole community and how this can be achieved. It also requires a broad and long-term perspective on what is needed for sustainable human development and how to achieve the goals of such development.

### **6. Equity and inclusiveness:**

A society's well-being depends on ensuring that all its members feel that they have a stake in it and do not feel excluded from the mainstream of society. This requires all groups, but particularly the most vulnerable, have opportunities to improve or maintain their well-being.

### **7. Effectiveness and efficiency:**

Good governance means that processes and institutions produce results that meet the needs of society while making the best use of resources at their disposal. The concept of efficiency in the context of good governance

also covers the sustainable use of natural resources and the protection of the environment.

## **8. Accountability:**

Accountability is a key requirement of good governance. Not only governmental institutions but also the private sector and civil society organizations must be accountable to the public and to their institutional stakeholders. Accountability cannot be enforced without transparency and the rule of law.

**Government, Governance and Good Governance:** The word ‘Governance’ lends itself to wider meaning which includes the processes as well as the results, making it more comprehensive in meaning and implications than the word ‘government’. Government refers to the machinery and institutional arrangements of the ‘political community’ whereas governance means making policies for the development of organisations as well as people.

While governance, on the one hand, deals with collaborative partnership networks which are necessary for policy formulation and implementation, good governance, on the other hand, attempts to make this activity not just efficient but also more accountable, democratic and responsive to the public needs.

Good governance goes beyond the formal institutions of democratic government to address several other central issues which includes — representative legislature; non-discriminatory laws; efficient, impartial and rapid judicial processes; transparent public agencies; Universal protection of human rights; accountability for decisions by public officials, devolution of resources and decision making to local.

### **Good Governance in India:**

Kautilya’s Arthashastra highlighted the principle of good governance as, —In the happiness of his people lies king’s happiness, in their welfare his welfare, whatever pleases himself he shall not consider as good, but whatever pleases his people he shall consider as good."

The Indian Constitution has not used the term even once in its preamble. Indeed, the Constitution has used ‘governance’ only once — in its directive principles of state policy. Article 37 says: ‘The provisions contained in this part shall not be enforceable by any court, but the principles therein laid down are nevertheless fundamental in the governance of the country and it shall be the duty of the state to apply these principles in making laws.’ The directive principles of the state

policy emphasize the 'content' part of good governance. E.g. Right to an adequate means of livelihood, Equal pay for equal work for both men and women is ensured, equitable distribution of resources etc.

The problem of good governance (read administrative reform) is discussed in each five-year plan as well as by parliamentary committees. Besides, the Government of India has appointed no less than 34 committees devoted to good governance making a large number of recommendations.

The plan documents in post 1990 reflected the essential principles of good governance including constitutionally protected right to elect government, accountable and transparent government, effective and efficient delivery of social and economic public services, a special attention for ensuring the effectiveness and efficiency of local governments, delivery of key services such as primary education and health, the rule of law, protection of the disadvantaged groups, especially the SCs, STs, minorities and others etc.

One of the best policies that has set an example in the country is the Right to Information Act which came into full force in the midnight of 12th and 13th October 2005. Under the act any citizen can seek information from government or public authorities as notified in the act. The act seeks to deepen Indian democracy by empowering the citizens to obtain the needed information from the public authorities at the national, state and local levels and aims at good governance by ensuring the much-needed transparency and accountability in them.

Another such initiative is The National Rural Employment Guarantee Act (NREGA), 2005, which has now been renamed as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). It is one such step towards implementing the provision of Right to Work and is the largest social welfare scheme of its kind in the world.

Even The Right to Education (RTE) Act, 2009, may be legitimately hailed as one of major landmark legislations that have been enacted by Parliament in the 21st century, with a view to achieve the objectives of Good Governance. It aims at fulfilling the promise of universal education by making it a mandatory obligation for the state to ensure that all children of the 6-14 years age group enroll themselves in schools and attend the classes.

**In conclusion**

After understanding the concept, meaning, principles and examples of good governance, one can infer that it is a broad and dynamic concept. Governance to become good governance needs participation of people at each stage through which ideals of the same can be achieved for a better welfare of people. The values of good governance need to be cherished and practiced in a true sense to make governance more efficient, effective and beneficial to the citizens.

**Operation of the syllabus:**

The syllabus has to be operationalized in the following manner

Apart from the theoretical understanding given in the above section, the students should be encouraged to follow democratic principles in their daily life

They should be encouraged to make presentations on various electoral processes

They should be encouraged to propagate and enthuse for registering voters

The students should ensure full class registers as voters if they are not.

The school/colleges may have essay writing competitions on electoral /democratic processes

Interview at least on elected representative or politically active individual or one who had contested election to anybody in the area and make presentation in the class.

Role play, skits, short stories, short dramas, short films in case of BMM students', posters (fine and applied arts students) be used for part assessment during the course.

Depending upon the activities carried out by the students one student be declared leader of the month.

Mock Elections can be organised in your institutions.



**(For Sem II)**

# **YOGA AND PHYSICAL MANAGEMENT SKILL**

**(Non Credit Mandatory Course)**

**Self Instructional Material (SIM)**

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## Unit 1. Physical fitness Management

Physical fitness Management is to the human body what fine-tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us look, feel and do our best. Physical fitness is your ability to carry out tasks without undue fatigue. The components of physical fitness are cardiovascular endurance, muscle strength, muscle endurance, flexibility and body composition.

Physical fitness involves the performance of the heart and lungs, and the muscles of the body. In addition, since what we do with our bodies also affects what we can do with our minds, fitness influences to some degree qualities such as mental alertness and emotional stability.

Physical fitness has two types: general fitness (a state of health and well-being) and specific fitness (the ability to perform specific aspects of sports or occupations).

### 1.1 Physical Fitness Management

Physical Fitness Management is fine tuning of a body to carry out daily tasks and routine physical activities without fatigue is called physical fitness Management. In this Unit, we will look at the some components that make up physical fitness, how we can tune them and their benefits bring to our lives.

### 1.2 Cardiovascular Endurance

Cardiovascular endurance is a measure of the circulatory and respiratory systems, it is an ability to deliver oxygen and nutrients to and eliminate waste products from cells. Cells need oxygen and nutrients in order to fuel muscles during physical activity. When cells work, they produce wastes that need to be transport away. How efficiently body does these tasks is a measure of Cardiovascular endurance. At last it is an ability to perform tasks with more sustainable energy and for longer periods.

You can build your cardiovascular endurance through aerobic exercise, which is a type of exercise that uses oxygen to meet energy demands. The word aerobic means using oxygen, so aerobic exercise is literally exercise that uses oxygen. This oxygen is very helpful for body. The exercise is performed over time at low to moderate intensity, such as taking a comfortable jog, walking, Swimming, Dancing, and exercise with the treadmill

### **Importance of Cardiovascular Endurance .**

In the exercise cardio related exercise are more important to tune the body. To lose weight aerobic activity is essential to burn calories. Physical activity is also critical if you want to maintain strong heart health and keep the weight off for the long term. If your cardiovascular endurance is good, that means you are healthy enough to participate in the activities that will help you lose weight and keep it off. If your cardiovascular endurance is good then you are away from the modern disease as Blood sugar, Obesity, Heart related disease and etc.

How to Improve Cardiovascular Endurance.

If you have been sedentary for a long time and you have a heart or lung problem, you should see your doctor before you try to improve your cardiovascular endurance. Once you know that you are healthy, enough for exercise, and then it is time to boost your heart and lung health.

You can do simple beginner workouts at home, First you start with a walk or jog outside with friends, or join a gym to swim or take an aerobics class. Try to choose activities that you enjoy. You can also ask a friend or family member to join you on your sessions. Social support will help you stay on track and makes each work out more enjoyable.

At first set the possible target as five minutes of jogging /walking one day alternate. You have to decide in what target heart zone you have to do exercise. Experts have figured out an ideal range of heart rates that allow you to work as hard as you need to without overdoing it.

These target heart rate zones give you a starting point for figuring out just how hard you need to work when you exercise. So, how do you figure out your target heart rate zones?

The **Karvonen** Formula is one of the most popular calculations used for figuring out heart rate zones, The Karvonen Formula for a Man is  $206.9 - (0.67 \times 23 (\text{age})) = \text{MHR (maximum heartrate)}$

Karvonen found that women have a different heart rate response to exercise. This once again changes the formula for women. In this case, it becomes  $206 - (0.88 \times \text{age}) = \text{MHR}$

To see how all this works in the real world, below are two examples that use the Karvonen Formula to calculate heart rate zones.

Besides the numbers mentioned in the formula, you will also need to know your **resting heart rate**.

To find this, take your pulse for one full minute when you first wake up in the morning.

If you cannot do that, try taking your pulse after resting for 30 minutes or so. You can also use a heart rate monitor to track your heart rate as well.

For the first example, take a 23-year-old man with a **RHR (resting heart rate)** of 65 beats per minute. We can figure out the low end of this person's target **heart rate zone** as well as the high end. The minimum is considered about 65% of MHR, while the Maximum is considered about 85% of MHR and you will see both of those percentages used in the examples.

The Karvonen Formula for a Man Start with the following formula:

$$206.9 - (0.67 \times 23 (\text{age})) = 191$$

$$\begin{aligned} \text{Target Heart Zone(min)} &= 191 - 65 \text{ (Maximum heart rate-RHR)} = 126 \\ &= 126 \times 65\% \text{ (low end of heart rate zone)} = 82 \\ &= 82 + 65 \text{ (resting heart rate)} = 147 \end{aligned}$$

$$\begin{aligned} \text{Target Heart Zone(max)} &= 126 \times 85\% \text{ (the high end)} = 107 \\ &= 107 + 65 \text{ (resting heart rate)} = 172 \end{aligned}$$

the target heart rate zone for this person would be 147 to 172 beats per minute.

The Karvonen Formula for a Woman

For the next scenario take a 49-year-old woman with a resting heart rate (RHR) of 65. Remember, for women the MHR changes to  $206 - (0.88 \times \text{age})$ :  $206 - (0.88 \times 49) = 163$  ;

$$163 - 65 \text{ (RHR)} = 98$$

$$\begin{aligned} \text{Target Heart Zone(min)} &= 98 \times 65\% \text{ (low end of heart rate zone)} = 64 \\ &= 64 + 65 \text{ (RHR)} = 129 \end{aligned}$$

$$\begin{aligned} \text{Target Heart Zone(max)} &= 98 \times 85\% \text{ (high end)} = 83 \\ &= 83 + 65 \text{ (RHR)} = 148 \end{aligned}$$

The target heart rate zone for this woman would be 129-148 beats per minute.

Monitoring Your Heart Rate

Once you get your heart rate, how do you monitor it? The easiest way is to use a Heart Rate Monitor. Of course, you do not need a heart rate monitor, but it really does help to see the numbers in black and white. That gives you an objective measure of how hard you're actually working, which can make your workouts better over time.

The more you understand how your body responds to different types of exercise, the more you can control how those workouts can work for you.

Choosing Your Exercise

Your first step in setting up a program is to figure out what kind of activities you would like to do. The trick is to think about what is accessible to you, what fits your personality and what you would feel comfortable fitting into your life. If you like to go outdoors, running, cycling, or walking are all good choices.

If you prefer going to the gym, you have access to many more options in the form of machines like stationary bikes, elliptical trainers, treadmills, rowing machines, stair climbers, the pool, and more.

After you choose what to do, the most important element of your workout will now be how long you do it. You should work on duration before you work on anything else like doing high intensity workouts; it takes time to build up the endurance for continuous exercise.

The guidelines suggest anywhere from 20 to 60 minutes of cardio to be healthy, lose weight and get fit, depending on the types of workouts you do.

To start, choose an accessible exercise like walking or a treadmill, and start with about 10-20 minutes of brisk walking at a moderate intensity. That means you're just out of your comfort zone...

Beginner workout options:

- 20-Minute Cardio for Absolute Beginners: If you're not sure where to start, this program will let you pick any machine or activity that you're comfortable with.
- Stationary Bike Workout for Beginners: This 20-minute workout is great if you want a workout with no impact.

The frequency of your workouts will depend on your fitness level and your schedule. The general guidelines are:

For health, try moderately intense cardio 30 minutes a day, five days a week, or vigorously intense cardio 20 minutes a day, 3 days a week - You can also do a mixture

To maintain weight and/or avoid regaining weight, you need about 150-250 minutes per week (20-35 minutes daily) or try burning 1200 to 2000 kcal a week

For weight loss, your workout time climbs to 200-300 minutes each week of a mix of moderate and high intensity exercise

Keep in mind that your target heart rate calculation is not 100% accurate so you might want to use a combination of perceived exertion and your heart rate to find a range that works for you.

Whatever you do, remember to keep it simple. Just start somewhere and make it a goal to do something every day, even if it is just a 5-minute walk. Try doing it as you decide a schedule and put it on your calendar.

The more you practice the easier it gets.

### **1.3 Muscle Strength and Endurance**

Muscular strength and endurance are two important parts of your body's ability to move, lift things and do day-to-day activities.

Muscular strength is the amount of force you can put out or the amount of weight you can lift.

Muscular strength: is the amount of force a muscle can produce with a single maximum effort. Muscle strength is relate to the size of your muscle fibers and the ability of nerves to activate muscle fibers.

The idea is that, when you use more resistance than your body normally handles, your muscles get stronger, along with your bones and connective tissue, all while building lean muscle tissue. it's also important to understand the benefits of strong muscles. Building muscle strength helps with body alignment, makes performing everyday actions easier, increases metabolism, and relieves stress. Muscular strength is usually measured with a one-rep maximum (1-RM) test. During a 1-RM, an exerciser performs one repetition of a single exercise to see how much weight he or she can lift.

Muscular endurance is how many times you can move that weight without being exhausted (very tired).

Muscular endurance: is the ability to resist fatigue while holding or repeating a muscular contraction

Weight training involves using some type of resistance to do a variety of exercises designed to challenge all your muscle groups, including your chest, back, shoulder, biceps, triceps, core, and lower body.

A person with a moderate to high level of muscular strength and endurance can perform everyday tasks—such as climbing stairs and carrying groceries—with ease.

For example, the number of push-ups you can do in one minute depends in part on your muscular strength but also on your muscular power and muscular endurance.

The best way to build muscle strength is to participate in a program of resistance training. Some people call it strength training or "weightlifting." But you don't have to lift weights to improve your muscles. You can do simple bodyweight exercises at home to build muscle and build strength.

Strength training improves both the size of your muscle fibers and it also improves the ability of your nerves to communicate with the muscles. So as your muscles get bigger with resistance training (muscle hypertrophy), they also become more coordinated and better able to perform movements that require strength.

So how long does it take to build muscle strength? After 2-3 weeks of resistance training or strength training, you'll probably notice that your muscles get stronger. In addition, you may notice greater muscle definition. That is, your muscles become "defined" and easier to see on your body. If your muscles get bigger but you still carry too much fat, you may not see sculpted muscles on your body. To improve both muscle definition and muscular strength you need to combine a healthy diet to lose fat with a resistance-training program to build muscle.

#### Benefits of Building Muscular Strength

When you improve muscular strength, you enjoy many different benefits, especially if you are trying to lose weight. In addition, you do not have to be an expert bodybuilder to take advantage of them. Strength training provides benefits for exercisers of all levels.

When you include strength training in your exercise program you build, lean muscle mass and improve your metabolism. Having stronger muscles will also help you to move through your daily activities in addition, burn more calories with greater ease. Moreover, muscles help to improve the way that your body looks. A tighter, leaner body looks better at every size.

#### **1.4 Flexibility**

Flexibility is the range of motion in a joint or group of joints or the ability to move joints effectively through a complete range of motion. Flexibility training includes stretching exercises to lengthen the muscles. Improving your flexibility can help you move more comfortably throughout the day.

For example, you might be very flexible in the hamstrings, allowing you to bend over and touch your toes. But your thighs (quadriceps) muscles might be tight (inflexible) so it may be harder for you to stand up straight or bend backward. Many people who work in an office all day develop inflexible hips as a result of sitting all day. .

Stretching improves flexibility. However, you do not have to do hours of stretching to enjoy the benefits of flexibility training.

There are different types of stretching to improve flexibility.

1. Static stretching is move into a position that lengthens a target muscle and hold the position for 15-60 seconds. It is best to remember to breathe as you hold each stretch.
2. Dynamic stretching isto move in an out of a position that lengthens a target muscle with gentle bouncing movement and sometimes called ballistic stretches.
3. Active isolated stretching (AIS) is to move you are joint through a complete range of motion, holding the endpoint only briefly, and then return to the starting point and repeat. Many athletes and active exercisers use active isolated stretching to prevent injuries or muscle imbalance.

### **1.5 Balanced Diet**

A balanced diet is one that gives your body the nutrients it needs to function correctly. To get the proper nutrition from your diet, you should consume the majority of your daily calories in: fresh fruits ,fresh vegetables , whole grains , legumes ,nuts , lean proteins

About calories

The number of calories in a food is a measurement of the amount of energy stored in that food. Your body uses calories from food for walking, thinking, breathing, and other important functions.

The average person needs to eat about 2,000 calories every day to maintain their weight. However, a person's specific daily calorie intake can vary depending on their age, gender, and physical activity level. Men generally need more calories than women do, and people who exercise need more calories than people who do not.

- active women ages 14 to 30 years: 2,400 calories
- sedentary women ages 14 to 30 years:1,800 to 2,000 calories
- active men ages 14 to 30 years: 2,800 to 3,200 calories
- sedentary men ages 14 to 30 years: 2,000 to 2,600 calories
- active men and women over 30 years:2,000 to 3,000 calories
- sedentary men and women over 30 years:1,600 to 2,400 calories

The source of your daily calories is just as important as the number of calories you consume. You should limit your consumption of empty calories, meaning those that provide little or no nutritional value.

Why a balanced diet is important

A balanced diet is important because your organs and tissues need proper nutrition to work effectively. Without good nutrition, your body is more prone to disease, infection, fatigue, and poor performance. Children with a poor diet run the risk of growth and developmental problemsand poor academic performance, and bad eating habits can persist for the rest of their lives.

Rising levels of obesity and diabetes in India are prime examples of the effects of a poor diet and a lack of exercise.

The following food groups are essential parts of a balanced diet.

Fruits

Besides being a great source of nutrition, fruits make tasty snacks. Choose fruits that are in season in your area. They are fresher and provide the most nutrients.

#### Vegetables

Vegetables are primary sources of essential vitamins and minerals. Dark, leafy greens generally contain the most nutrition and can be eaten at every meal. Eating a variety of vegetables will help you obtain the bountiful nutrients that all vegetables provide.

#### Grains

Whole grains, however, are prepared using the entire grain, including the casing. They provide much more nutrition. Try switching from white breads and pastas to whole-grain products.

#### Proteins

Meats and beans are primary sources of protein, a nutrient that is essential for proper muscle and brain development. Nuts and beans are good sources of protein and contain many other health benefits, as well as fiber and other nutrients. Try to eat: lentils, beans, peas, almonds, sunflower seeds, walnuts, Tofu, tempeh, and other soy-based products are excellent sources of protein and are healthy alternatives to meat.

#### Dairy

Dairy products provide calcium, vitamin D, and other essential nutrients. However, they are also major sources of fat, so it may be best to choose small portions of full-fat cheeses, and reduced-fat or fat-free milk and yogurt. Plant-based milks, such as those made from flaxseed, almonds, or soy are typically fortified with calcium and other nutrients, making them excellent alternatives to dairy from cows.

#### Oils

Oils should be used sparingly. Opt for low-fat and low-sugar versions of products that contain oil, such as salad dressing and mayonnaise. Good oils, such as olive oil, can replace fattier vegetable oil in your diet. Avoid deep-fried foods because they contain many empty calories.

Besides adding certain foods to your diet, you should also reduce your consumption of certain substances to maintain a balanced diet and healthy weight. These include: refined grains, solid fats, saturated fats, trans fats, salt and sugars

## Question Bank

1. A \_\_\_\_\_ is described as a condition that helps us look, feel and do our best. (Fitness, Power, Fatigue, Muscles)
2. A Fitness is described as a \_\_\_\_\_ that helps us look, feel and do our best.(Exercise , condition, Fatigue, Muscles)
3. Physical fitness is your ability to carry out tasks without undue \_\_\_\_\_.( Fitness, condition, Fatigue, Muscles)
4. Physical fitness involves the performance of the heart and lungs, and the \_\_\_\_\_of the body. (Fitness, condition, Fatigue, Muscles)
5. The ability to carry out daily tasks and routine physical activities without fatigue is called \_\_\_\_\_.(physical fitness Management, condition, Fatigue, Muscles)
6. Cardiovascular endurance is a measure of the circulatory and respiratory systems' ability to deliver \_\_\_\_\_and nutrients to and eliminate waste products from cells.( oxygen, fitness Management, Carbon dioxide )
7. Aerobic exercise is literally exercise that uses \_\_\_\_\_.( oxygen, Nitrogen, Carbon dioxide ,all of three )
8. Aerobic activity is essential to burn calories and \_\_\_\_\_. ( oxygen, lose weight, exercise , Heart)
9. These target heart rate zones give you a starting point for figuring out just how hard you need to work when you\_\_\_\_\_.(oxygen, lose weight, exercise , Heart)
10. The \_\_\_\_\_Formula is one of the most popular calculations used for figuring out heart rate zones.( oxygen, exercise ,Karvonen., Heart )
11. MHR is maximum \_\_\_\_\_rate. ( oxygen, exercise ,Karvonen., Heart )
12. RHR is \_\_\_\_\_heart rate.( Resting, Regular ,Karvonen., Heart )
13. If you like to go \_\_\_\_\_the running, cycling, or walking are all good choices.( oxygen, exercise ,Outdoor, Indoor )
14. If you prefer going to the\_\_\_\_\_, you have access to many more options in the form of machines like stationary bikes, elliptical trainers, treadmills, rowing machines, stair climbers, the pool, and more.( Gym, exercise ,Outdoor, Indoor )
15. The frequency of your \_\_\_\_\_will depend on your fitness level and your schedule.( Workout , exercise ,Outdoor, Indoor )
16. Muscular \_\_\_\_\_and endurance are two important parts of your body's ability to move, lift things and do day-to-day activities. ( Strength, exercise ,Cardio, Indoor )
17. Muscular strength is the amount of \_\_\_\_\_you can put out or the amount of weight you can lift.( Strength, Force, Nerves, Weight)

18. The size of your muscle fibers and the ability of \_\_\_\_\_ to activate muscle fibers are related to muscle strength.( Strength, Force, Nerves, Weight)
19. Muscular endurance is how many times you can move that \_\_\_\_\_without being exhausted.( Strength, Force, Nerves, Weight)
20. The best way to build muscle strength is to participate in a program of\_\_\_\_\_.(Lose weight , Force, resistance training, Weight)
21. Flexibility is the range of \_\_\_\_\_in a joint or group of joints or the ability to move joints effectively through a complete range of motion.(Motion, Body, Speed ,oxygen)
22. Flexibility training includes \_\_\_\_\_exercises to lengthen the muscles.(Stretching, Strength, endurance, All of three )
23. Flexibility training includes stretching exercises to \_\_\_\_\_the muscles. (lengthen ,Short, power, Speed )
24. \_\_\_\_\_improves flexibility.(Endurance, Stretching, Weight Training,Gym)
25. \_\_\_\_\_stretching is move into a position that lengthens a target muscle and hold the position for 15-60 seconds. (Static, Dynamic, Active isolated stretching , All three )
26. Staticstretching is move into a position that lengthens a target \_\_\_\_\_and hold the position for 15-60 seconds(Muscle, Lungs, Heart ,Nerves )
27. Staticstretching is move into a position that lengthens a target muscle and hold the position for 15-60\_\_\_\_\_. ( Days, Seconds , Hours, Weeks )
28. \_\_\_\_\_stretching is to move in an out of a position that lengthens a target muscle with gentle bouncing movement and sometimes called ballistic stretches.(Static, Dynamic, Active isolated stretching , All three )
29. Dynamic stretching is to move in an out of a position that \_\_\_\_\_a target muscle with gentle bouncing movement and sometimes called ballistic stretches.(lengthens, Lungs, Heart ,Nerves )
30. Dynamic stretching is to move in an out of a position that lengthens a target muscle with gentle \_\_\_\_\_movement and sometimes called ballistic stretches.( muscle, Bouncing, Static, Dynamic)
31. Dynamic stretching is to move in an out of a position that lengthens a target muscle with gentle bouncing \_\_\_\_\_and sometimes called ballistic stretches..( dance, Movement, running, walking )
32. Dynamic stretching is to move in an out of a position that lengthens a target muscle with gentle bouncing movement and sometimes called \_\_\_\_\_stretches.
33. \_\_\_\_\_isolated stretching (AIS) is to move you are joint through a complete range of motion, holding the endpoint only briefly, and then return to the starting point and repeat.
34. Active \_\_\_\_\_stretching (AIS) is to move you are joint through a complete range of motion, holding the endpoint only briefly, and then return to the starting point and repeat.

35. Active isolated \_\_\_\_\_(AIS) is to move you are joint through a complete range of motion, holding the endpoint only briefly, and then return to the starting point and repeat.
36. Active isolated stretching (AIS) is to move you are joint through a complete range of\_\_\_\_\_, holding the endpoint only briefly, and then return to the starting point and repeat.
37. Active isolated stretching (AIS) is to move you are joint through a complete\_\_\_\_\_of motion, holding the endpoint only briefly, and then return to the starting point and repeat.
38. Active isolated stretching (AIS) is to move you are joint through a complete range of motion, holding the endpoint only briefly, and then \_\_\_\_\_to the starting point and repeat.
39. A \_\_\_\_\_diet is one that gives your body the nutrients it needs to function correctly
40. A balanced \_\_\_\_\_is one that gives your body the nutrients it needs to function correctly
41. A balanced diet is one that gives your body the \_\_\_\_\_it needs to function correctly
42. A balanced diet is one that gives your body the nutrients it needs to \_\_\_\_\_correctly.
43. The \_\_\_\_\_of calories in a food is a measurement of the amount of energy stored in that food.( a. Number b. kilo c. grams d. Kg )
44. The number of \_\_\_\_\_in a food is a measurement of the amount of energy stored in that food.( a. Calories b. kilo c. grams d. Kg )
45. The number of calories in a \_\_\_\_\_is a measurement of the amount of energy stored in that food.( a. water b. Food c. oil d. Kg )
46. The number of calories in a food is a measurement of the \_\_\_\_\_of energy stored in that food.( a. Amount b. kilo c. grams d. Kg )
47. The average person needs to eat about \_\_\_\_\_calories every day to maintain their weight.( a. 5000 b. 3000 c. 2000 d. 1200 )
48. The average person needs to eat about 2000 calories every \_\_\_\_\_to maintain their weight. ( a. Month b. hour c. week d. day )
49. \_\_\_\_\_generally need more calories than women.( a. Calories b. Men c. exercise d. Kg )
50. Men generally need more \_\_\_\_\_than women. ( a. Calories b. kilo c. grams d. Kg )

## Unit 2. YOGA

### योग व्याख्या, संकल्पना आणि इतिहास

शिक्षण हे माणसाला समृद्ध आणि आनंदी बनविण्यासाठी गरजेचे आहे. आपल्या मधील प्रत्येक व्यक्तीची आनंदी बनणे ही गरज आहे. परंतु आज अनेक ठिकाणी शिक्षणाचा प्रसार होवून देखील मनुष्य हृदयातून, मनातून, अंतःकरणातून सुखी आणि आनंदी आहे का? हा मोठा प्रश्न आहे. विशेषत्वाने गेल्या पन्नास वर्षांमध्ये भौतिक दृष्ट्या मनुष्याने भरपूर प्रगति केली आहे. असे असून देखील मानसिक ताणतणाव व चिंता या सातत्याने सतावत आहेत. या परिस्थितीमुळे शारिरीक रोग निर्माण होत आहेत.

या सर्वांवर उपाय शोधण्याचा प्रयत्न म्हणून भारताच्या प्राचीन 'योग पध्दती' कडे वळण्याचा साल्ला तज्ञ मंडळी देत आहेत. प्राचीन भारतीय संस्कृती ने संपूर्ण जगाला दिलेली महत्वपूर्ण भेट म्हणून योग पध्दती कडे पाहिले जाते. 'योग' हे केवळ व्यायाम प्रकार नसून ती एक संपूर्ण जीवन पध्दती आहे. या जीवन पध्दती मध्ये आहार, विहार, निद्रा, विचार शैली योगासने व प्राणायाम पंचकोश घटकांचा समावेश होतो

### 'योगाची व्याख्या'

#### 1) By swami shivvanand':

'Yoga is integration and harmony between thoughts, words and deeds. It is integration between need, heart and hands,

#### 2) By maharshi patanjali :

"Yoga implies control over the conscious', unconscious, and super conscious - of our.....

#### 3) योग चित्तवृत्ती निरोधः चित्ताच्या वृत्तीचा निरोध म्हणजे योग होय.

#### 4) Yoga is coordination and harmony between mind and body.

#### 5) Yoga is union between the limited jiva ( Atma) and cosmic self i. e. parmmatma.

### योगाचा इतिहास

सुमारे 2500 वर्षांपूर्वी महर्षी पतंजली यांनी विविध उपनिषदे, वेद, इत्यादी मधुन योग या विषयीची सर्व माहिती एकत्र करून 196 योग सुत्राची रचना केली. या योग सुत्रांमध्ये योग याविषयी सर्व माहिती एकत्रित पणे अभ्यासाला उपलब्ध आहे. महर्षी पतंजली यांचे 196 योग सुत्रे प्रमाण ग्रंथ म्हणून सर्व मान्य आहेत. योगाची मुख्य अंगे आठ आहेत त्यांना "अष्टांग योग" असे म्हटले जाते. ही आठ अंगे पुढीलप्रमाणे आहेत. यम, नियम, आसन, प्राणायाम प्रत्याहार, धारणा, ध्यान व समाधी

योगाच्या या आठ अंगांपैकी केवळ आसन आणि प्राणायाम या दोनच अंगाचा विचार या ठिकाणी आपण अधिक प्रमाणत करणार आहोत.

## योगासने व प्राणायाम यांचे फायदे :-

योग ही एक जीवन पध्दती असून तीचे अनेक प्रकारचे फायदे हे योग जीवन पध्दतीचा प्रत्यक्ष अवलंब करणाऱ्या व्यक्तीस अनुभवयला येतात.

### 1. शारिरीक फायदे :-

योगासने आणि प्राणायाम यांचे नियमितपणे प्रत्यक्ष पालन केल्यानंतर अनेक फायदे विद्यार्थ्यांच्या शरीरावर जाणवू शकतात.

1. योगासने आणि प्राणायामामुळे शरीरा लवचिक आणि सदृढ बनते.
2. सांध्याच्या हालचाली अधिक चांगल्या पध्दतीने होवून सांधेदुखी कमी होण्यास मदत मिळते.
3. हृदयविकार, उच्च रक्तदाबाचे विकार, मधुमेह, अस्थमा, कॅन्सर यांसारखे विकार नियंत्रणात राहतात.
4. प्राणायामामुळे प्राणवायुचा शरीरामध्ये सर्वत्र संचार होवून फुफ्फुसे, हृदय, मेंदू, रक्तवाहिन्या सर्वत्र संचार होवून फुफ्फुसे, हृदय, रक्तवाहिन्या जठर आतडी इत्यादींच्या कार्यक्षमता सुधारते.

### 2. मानसिक फायदे :-

1. नियमित योगासने केल्याने मानसिक स्तरावरचा ताणतणाव नियंत्रणात ठेवण्यास मदत मिळते.
2. प्राणायाम तसेच सुक्ष्म हालचालीमुळे मनास स्थैर्य मिळते.
3. योगासनामुळे स्मरणशक्ती मध्ये वृद्धी होण्यास मदत मिळते.
4. नियमित योगाभ्यासामुळे एकाग्रता वाढून अभ्यासामध्ये भरपूर फायदा होतो.

### 3. भावनिक फायदे:-

1. नियमित योगाभ्यासामुळे भावनांची उध्दीगतता कमी राखण्यास मदत मिळते.
2. स्थिर चित्तवृत्ती निर्माण होते. व त्यामुळे आनंदाने हुरहुरणे व दुःखते कोसळणे हे होत नाही.
3. जय पराजय, स्तुती निंदा, लाभ हानी या सर्व प्रकारच्या द्वंद्वामध्ये समभाव राखला जातो.
4. योगाभ्यास हा भावनेतील हा अवांच्यत विचार शृंखलेवर नियंत्रण ठेवण्यास मदत करतो. त्यामुळे प्रणिक ऊर्जा वाचवायस मदत होते.

### आसने :-

व्यायामाच्या अनेक प्रवाहांमध्ये योगासनांचे विशेष महत्व आहे. हात व पायांची विशेष अशी सुस्थिती म्हणजे आसन होय. "स्थिर सुखासतम्" महर्षी पतंजली नी योगसुत्रामध्ये व्याख्या केली आहे.

आसने अनेक प्रकारची आहेत. विविध प्रकारच्या शारिरीक स्थिती मध्ये करायची आसनांचे 7 प्रमुख प्रकार पडतात.

### उदा :-

अ. क्र	शारिरीक स्थिती	बसुन करावयाची आसने (बैठक स्थिती)	जमिनीवर टेकवून करावयाची आसने (ष्यनस्थिती )	पोट जमिनीवर टेकवून करावयाची आसने (विपरीत शयन स्थिती)	पायावर उभे राहून करावयाची आसने
1.		पद्मासन	शवासन	अर्ध शलभासन	गरुडासन
2.		बद्धपद्मासन	एकपाद उस्तानासन	पुर्ण शलभासन	वृक्षासन
3.		पर्वतासन	उतानपादासन	भुजंगासन	उत्कटासन

4.	आसनाचे नाव	सिंहासन	पवनमुक्तासन	घनुरासन	तरासन
5.		गोमुखासन	विपरीतकरणी मुद्रा किंवा विलोभावन	मकरासन	त्रिकोनासन
6.		पश्चिमेत्तासन	सर्वांगासन		पादहस्तासन
7.			हलासन		

अ) बसुन करावयाची आसने :-

1. पद्मासन (आकृती क. 1)



पद्म म्हणजे कमळ. या आसनामध्ये शरीराची अवस्था कमळा प्रमाणे भासते म्हणून या आसनाला पद्मासन म्हणतात.

कृती : 1. जमिनीवर पाय लांब करून ताठ बसावे.

2. उजव्या पायाचे पाऊल डाव्या पायाच्या जांघेत ठेवावे.

3. डाव्या पायाचे पाऊल उजव्या पायाच्या वरून घेवून उजव्या पायाच्या जांघेत ठेवावे.

4. दोन्ही हातांचे अंगठे आणि तर्जनीची टोके एकमेकांशी चिकटवून डावा हात डाव्या गुडघ्यावर व उजवाहात उजव्या गुडघ्यावर ठेवावा.

5. डोळे षांतपणे मिटून घ्यावेत व शरीरावर कोणत्याही भागावर अतिरिक्त ताण येवू न देता

मस्तक आणि पाठीचा कणा सरळ रेषेत ठेवावा.

6. श्वासोच्छ्वास मंद गतीने चालू ठेवावा व श्वासावर लक्ष केंद्रीत करावे.

7. साधकाच्या क्षमतेनुसार या आसनाचा कालावधी 30 सेकंदा पासुन सुरु करून हळुहळु 3 मिनिटा पर्यंत वाढवता येवू शकतो.

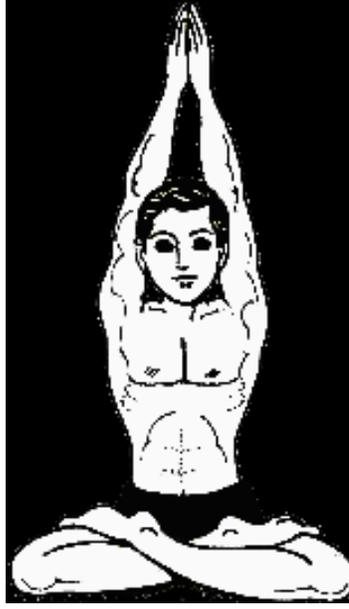
8. आसन सोडताना हळुवार पणे प्रथम डावा पाय व नंतर उजवा पाय सरळ करावा.

फायदे :-

1. मनाची एकाग्रता वाढवण्यास मदत घेते.

2. दमा, निद्रानाश, हिस्टेरिया या रोगांमध्ये फायदा होतो.

## 2. पर्वतासन (आकृती क - 2)



या आसनास वियोगासन असे देखील म्हणतात.

कृती -

1. प्रथम पद्मासन करावे.
2. नंतर हात जोडून घ्यावेत.
3. श्वास घेत दोन्ही (चित्रात दाखवत्या प्रमाणे) डोक्याच्या वर घेवून जावे व ते ताठ स्थितीत ठेवावेत.
4. 30 सेकंदा पासून ते 5 ते 10 मिनिटापर्यंत आसनाचा कालावधी हळुहळु नियमित सरावा व्दारे वाढवता येतो.
5. आसन सोडताना श्वास सोडत हात खाली घ्यावेत नंतर पद्मासन सोडावे.

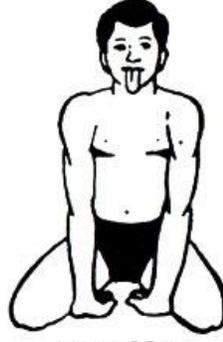
फायदे :-

1. या आसनात दोन्ही हात वर ठेवावे लागत असल्याने प्राणवायुची गती उर्ध्व होते.
2. या आसनामुळे हाताच्या स्नायुंना चांगला व्यायाम होतो.

### 3. सिंहासन (आकृती क्रं. 3)



(सिंहासन विधि-1)



(सिंहासन विधि-2)

या आसना मध्ये मुख (चेहरा) हा सिंहासारखा करावा लागतो म्हणून याला सिंहासन म्हणतात.

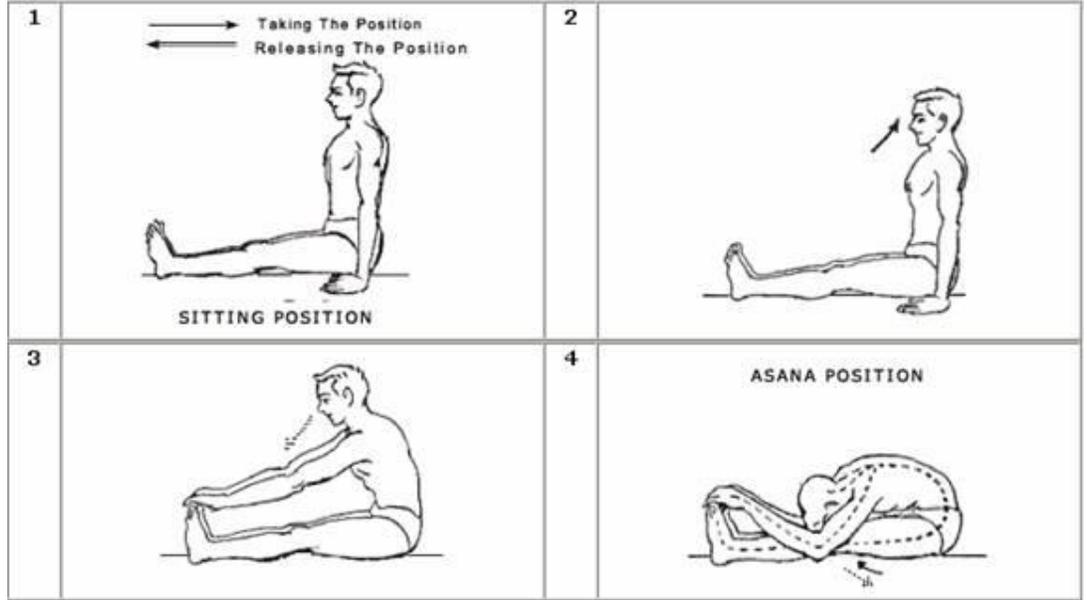
कृती :-

1. दोन्हीपाय गुडघ्यात वाकवून दोन्ही टाचांच्या मध्ये बसावे.
2. पायाचे अंगठे जुळलेले पण पायाच्या टाचांमध्ये सहा इंच अंतर (वज्रासन स्थिती)
3. दोन्ही गुडघ्यांमध्ये साधारण 6 इंच अंतर घ्यावे.
4. उजव्या हाताचा पंजा उजव्या गुडघ्यावर व डाव्या हाताचा पंजा डाव्या गुडघ्यावर ठेवावा.
5. दोन्ही नाकपुड्या व तोंडातुन श्वास बाहेर सोडतानाच जीभ बाहेर काढावी.
6. कंबर ताठ ठेवून चेहऱ्याचे सर्व स्नायू खेचले जातील असा ताणा.
7. सुरुवातीला आठवडयामधुन खेळा ही मुद्रा करावी.
8. आसन सोडताना चेहरा पुन्हा पुर्व स्थितीत आणावा व वजा सतात यावे.

फायदे :-

1. स्मरणशक्ती साठी हे आसन उपयुक्त आहे.
2. घसा, स्वरयंत्र, श्वसन व्यवस्था यांची ताकद वाढवण्यासाठी उपयुक्त.
3. डोळे व कानाचे कार्य सुधारते.
4. वज्रासना पासुन मिळणारे सर्व फायदे मिळतात.

4. पश्चिमोत्तानासन :- (आकृती क. 4)



पाठीच्या कण्याला लवचिकता आणण्यासाठी हे एक अत्यंत उपयुक्त आसन आहे.

कृती:-

1. जमिनीवर बसुन पाय लांब करुन ताठ ठेवा.
2. खोल श्वास घ्या.
3. त्यानंतर कमरेमध्ये पुढे वाकुन दोन्ही हाताच्या अंगठा तर्जनी व मधले बोट यांनी पायाचे आंगठे पकडा. ही कृती श्वास सोडत करा.
4. मग डोके (कपाळ) दोन्ही गुडघ्यांना टेकेल असे खाली वाकवा.
5. गुडघ्याला कपाळ टेकलेल्या स्थितीत 5 सेंकदा पासुन 10 मिनीटापर्यंत आपण या आसनात राहु शकता. हा कालावधी नियमित सरावाद्वारे हळुहळु वाढवायचा आहे.
6. आसन सोडताना श्वास घेत हुळहुळ वर उठा. नंतर पायाचे अंगठे सोडुन स्वस्थ स्थितीत

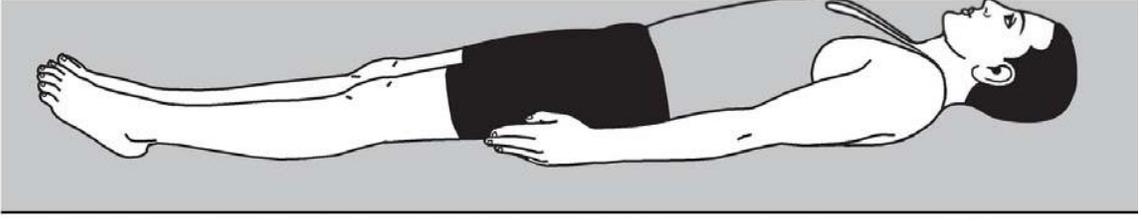
बसा.

फायदे :-

1. शरीर लवचिक बनते.
2. पाठीच्या कणा, मान, पायाची मागील बाजू हाताचे सांधे यांना ताण बसुन ते सुदृढ बनतात.
3. पोटाची चरबी कमी करण्यास मदत मिळते.

जमिनीला पाठ टेकवून करावयाची आसने. (षयनस्थिती)

1. श्वासन – (आकृती क्र. 5)



श्वासन म्हणजे शरीरातील मसासहीत सर्व अंतर्बाह्य अवयवास संपुर्ण विश्रांती देण्यासाठी उपयुक्त आसन आहे. स्पर्धात्मक व धावपळीच्या जीवनात तणावजन्य व्याधींवर एक प्रभावशाली उपाय म्हणून श्वासनाकडे पाहिले जाते.

कृती :-

1. पाठीवर उताणे झोपा.
2. दोन्हीहात शरीरापासुन 6 ते 8 इंचा अंतरावर तळहात आकाशाकडे करुन पसरा.
3. बोटे अर्धवट मिटलेला अवस्थेत ठेवा.
4. पायाची चवडे बाहेरच्या बाजुला व टाचा आतील बाजुस या प्रकारे दोन्ही पायांमध्ये जवळपास एक फुटाचे अंतर घ्या.
5. शांत चित्ताने श्वास घेणे व सोडणे सुरु राहु देत.
6. त्यानंतर डाव्या पायापासुन सुरु करुन शरीरातील एक एक अवयव शिथिल करा. पोटाचा संपुर्ण

भाग पाठ मान डोक्याचा भाग पुर्ण शिथिल करा.

7. त्यानंतर मंद श्वास गती सुरु ठेवून अंतः चेतनेचा अनुभव घ्या.
8. 10 – 15 मिनिटानंतर आसन सोडण्यासाठी हात व पायांच्या बोंटाच्या हलचाली करत हळुहळु आसन सोडा.

फायदे :-

1. या आसनामुळे शरीराला संपुर्ण विश्रांती मिळते.
2. मानसिक ताणतणावा तुन बाहेर पडण्यासाठी या आसनाचा खुप फायदा होतो.

## 2. एकपाद उतानासन (आकृती क्र. 6)



उतान म्हणजे आकाशाकडे तोंड वर करून उताणे झोपलेली अवस्था. पाद म्हणजे पाय. जमिनीवर पाठ टेकवून झोपलेल्या अवस्थेत पायांच्या सहाय्याने करायचे आसन आहे.

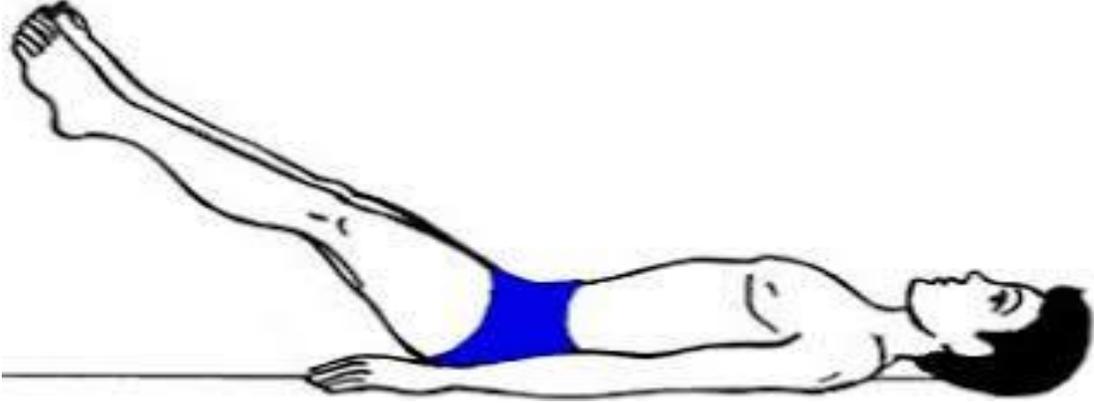
कृती :-

1. प्रथम पाठ जमिनीला टेकवून झोपा
2. दोन्ही पाय जुळलेले ठेवा. दोन्ही हाताचे तळवे जमिनीला टेकलेल्या स्थितीत राहु देत.
3. एक पाय शिथिल ठेवत श्वास आत घेत दुसरा पाय हळुहळु वर उचला.
4. श्वास सोडत पाय परत खाली घ्या.
5. असेच आवर्तन दुसऱ्या पायाने करा.
6. दोन्ही पायाची 4 ते 5 आवर्तने करा.

फायदे :-

1. या आसनामुळे पोटातील स्नायुंना आंतर बाहय भरपूर व्यायाम मिळतो.
2. पोटाचा घेर कमी होण्यास मदत मिळते.

### 3. उत्तानपादासन (आकृती क. 7)



एकपाद उत्तानपादासना प्रमाणेच या देखील आसनात पाठ जमिनीला टेकवून पाय वर उचलायचे आहेत. उत्तान पादासनांमध्ये दोन्ही पाय एकदम वर उचलायचे आहेत.

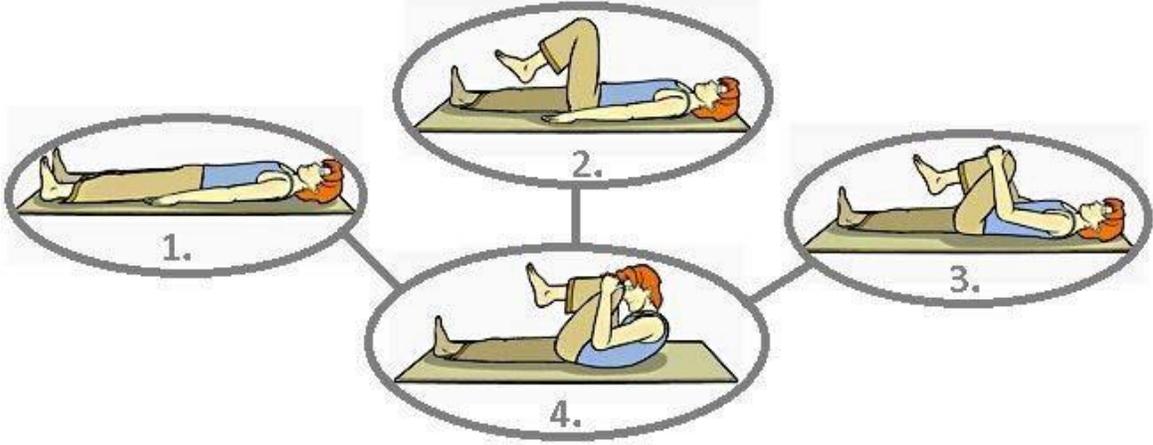
कृती :-

1. पाठीसर झोपा.
2. मंद गतीने श्वास आत घेत दोन्ही पाय हळुहळु वर उचला.
3. साधारण 10 ते 15 सेंकद या स्थितीत स्थिर राहण्यासाठी प्रयत्न करा.
4. हळुहळु श्वास सोडत पाय खाली आणा.
5. अशी 4 ते 5 आवर्तने क्षमतेनुसार करा.

फायदे :-

1. पोटाचे सर्व अवयव व स्नायुंची ताकद वाढवण्यास फार उपयुक्त आहे.
2. शरीरातील अतिरिक्त चरबी निघून जाण्यास मदत होते.

#### 4. पवनमुक्तासन (आकृती क्र. 8. 9)



पोटाची पचनशक्ती सुधारण्यास उपयुक्त असे हे आसन.

कृती :-

1. पाठ जमिनीला टेकवून झोपा.
2. दोन्ही पाय ताठ ठेवा.
3. उजवा गुडघा पोटाकडे खेचवून दोन्ही हातांने पोटावर दाबा.
4. उजव्या मांडीने पोटावर दाब द्या व या साठी हाताची मदत घ्या. (आकृती क्र. 8.)
5. हीच प्रक्रिया डाव्या पायाने करा.
6. हीच प्रक्रिया दोन्ही पायाने एकदम करा.(गर्भारपणात हे आसन स्त्रियांनी हे आसन करू नये.)
7. मांडया पोटावर दाबलेल्या स्थितीत असताना कपाळ गुडग्याला लावण्यासाठी प्रयत्न करावा.
8. श्वास सोडत हात व पाय पुवस्थितीत आणावेत.

फायदे :-

1. या आसनामुळे अधोवायु सहजगत्या मुक्त होतो.
2. वायुविकार, मलावरोध, अपचन कमिरोग मुळव्याध इ. रोंगावर खुप फायदा होतो.

## 5. सर्वांगा आसन (आकृती क्र. 10.)



शरीराच्या सर्व अवयवांना भरपूर पोषण देणारे आसन आहे.

कृती :-

1. जमिनीवर अताणे झोपा.
2. नाकावारे श्वास आत घेत दोन्हीपाय हळुहळु वर घ्या.
3. पाय, पाठ, कमरेचा भाग, पाठ, मानेपर्यंत वर उचलून घ्या.
4. आधारासाठी दोन्ही हाताचे तळवे पाठीस चिकटवा व दोन्ही हाताचे कोपरे जमिनीला टेकलेले असुदया .
5. दोन्ही पाय स्थिर ठेवत दृष्टी पायांच्या आंगठयावर एकाग्र करा.
6. मंद श्वास सुरू ठेवा.
7. या वेळी थोडेसे कमरेत झुकवून पाय जोक्यांच्या दिशेने घ्या.
8. सुरुवातीला 30 सेंकदा पासुन सराव करुन नियमित सरावाने या आसनाचा कालावधी 10 ते

15

मिनिंटापर्यंत वाढवता येतो.

9. आसन सोडताना श्वास सोडत दोन्हीपाय हळुहळु हताचा आधार घेत खाली घेवून पुर्व स्थितीत या.

फायदे :-

1. थायरॉड ग्रंथी चे आरोग्य या आसनामुळे सुधारते.
2. रक्तभिसरण सुधारते.
3. पाठीचा कणा लवचिक होतो.

c) पोट जमिनीला टेकवून करावयाची आसने.

विपरीत शयनस्थिती :-

या आसन प्रकारा मध्ये पोट व छाती जमिनीवर टेकवून झोपावे व मग आसन स्थिती मधुन एक एक आसने करावीत.

1. अर्धषलमासन (आकृती क्र. 11.)

शरीराचा आकार शलभ म्हणजे टोळाप्रमाणे दिसतो.

कृती :-

1. पोट छाती व कपाळ जमिनीवर टेकवून जमिनीवर झोपा.
2. हात तळवे जमिनीला टेकलेल्या स्थितीमध्ये मांडयाच्या खाली ठेवा.
3. आता श्वास घेत डावा पाय हवेत वर उचला व 10 सेंकद आसन स्थितीत राहा.
4. हीच स्थिती उजव्या पायाने करा.
5. या आसनांची 5 ते 6 आवर्तने करा.
6. आसन सोडताना पुर्व स्थितीत या.

फायदा :-

1. या आसनामुळे पश्चिमोत्ताना पेक्षा उलट मेरूदंडात व्यायाम मिळतो.
2. कमर हृदय सर्व अवयवयांना या आसनामुळे फायदा होतो.

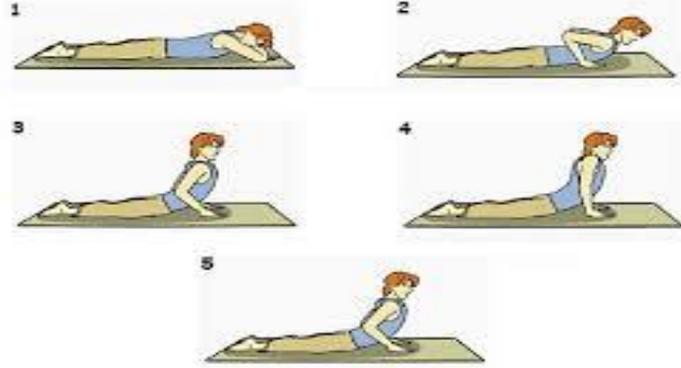
2. पुर्ण शतमासन (आकृती क्र. 12.)

कृती :-

1. पोट व हनुवटी जमिनीवर टेकवून झोपा
2. दोन्ही हात मांडीच्या जवळ ठेवा.
3. शरीर ताठ करत श्वास आत घेत दोन्ही पाय वर उचला.
4. 5 ते 30 सेंकदा पर्यंत आसन स्थितीत रहा.
5. आसन सोडताना श्वास सोडत पुर्वस्थितीत या.

## पोट जमिनीला टेकवून करावयाची आसने

### 3. भुजंगासन :- (आकृती क.)



भुजंग म्हणजे "नाग" या आसनामध्ये मस्तकापासून कमरे पर्यंतचा भाग वर उचलला जातो. व शरीराचा आकार फणा काढलेल्या नागाप्रमाणे दिसतो.

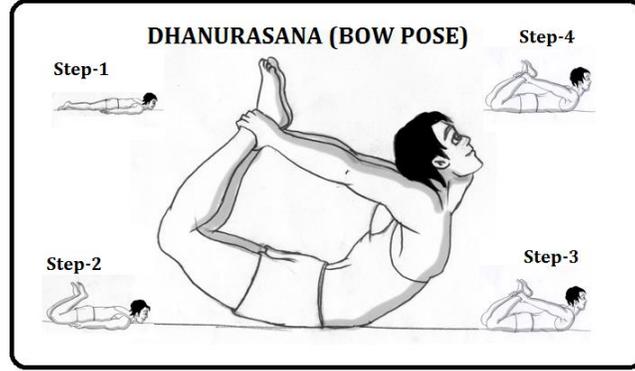
### कृती :-

1. पोटावर झोपा व मस्तक जमिनीवर टेकवा.
2. सर्व शरीर शिथिल करा. आणि हाताचे तळवे छातीच्या जवळ जमिनीला टेकवा.
3. हाताच्या तळव्याचा आधार घेवून श्वास घेत शरीराचा कमरेपर्यंत चा भाग हळुहळु वर उचला.
4. या आसन स्थितीत श्वास रोखुन धरत पाठीवर येणारा ताण अनुभवा.
5. क्षमतेनुसार 10 सेकंदापर्यंत आसन करावे.
6. हळुहळु आसन सोडत पुर्व स्थितीत यावे.

### फायदे :-

1. पाठ, कमर व मेरूदंडास चांगला व्यायाम होतो.
2. शरीराचा बांधा सुदृढ होतो.
3. पाठ तसेच पोटाचे स्नायु लवचिक बनतात.

## 2. धनुरासन :-



या आसना मध्ये शरीराचा भाग बाण विरहीत ताणलेल्या धनुष्या सारखा दिसतो.

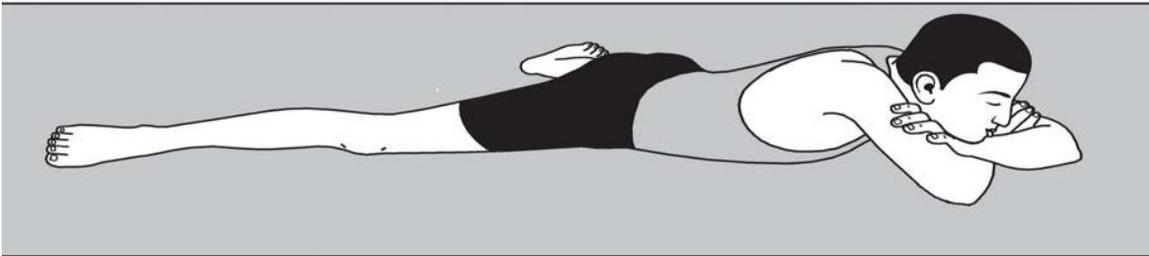
### कृती :-

1. पोटावर पालथे झोपा.
2. कपाळावर जमिनीवर टेकवा.
3. दोन्ही हात अंगालगत ठेवा.
4. शरीर शिथिल करा.
5. दोन्ही पाय गुडघ्यात वाकवा.
6. दोन्ही हातांनी दोन्ही पायांचे घोटयाचा भाग पकडा.
7. श्वास घेत संपुर्ण शरीर पुढच्या आणि मागच्या बाजूने वरच्या दिशेने खेचा.
8. 10 सॅकंदा पासून 1 मिनिट पर्यंत शारिरीक क्षमते नुसार करावे.
9. श्वास सोडत आसन हळुवार पणे सोडावे आणि पुर्व स्थितीत यावे.

### फायदे :-

1. पोट पाय या सर्वांना व्यायाम मिळतो.
2. शारिरीक संतुलन ठेवण्याची सवय लागते.
3. संधीवात नाहीसा होतो.

## 4. मकरासन :-



या आसन स्थितीत मगरी प्रमाणे शरीर दिसते.

कृती :-

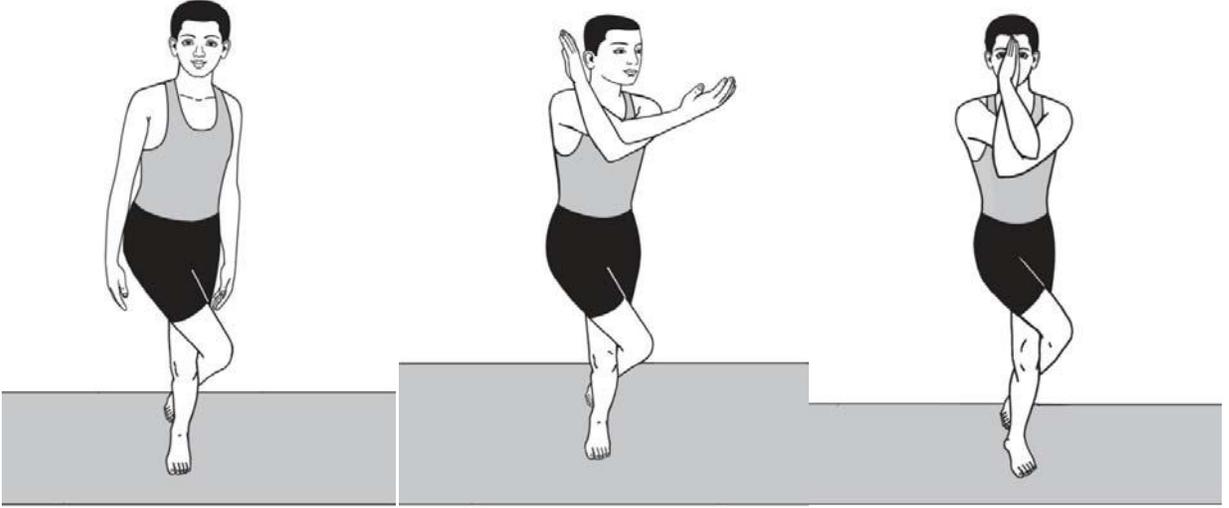
1. पोट व छाती जमिनीवर टेकवून झोपा.
2. पायामध्ये आरामदायी असे अंतर घ्या.
3. पायाचे चवडे जमिनीला स्पर्श करतील अशी पायांची ठेवण करा.
4. हात डोक्याच्या वरून घेवून डाव्या हाताने उजव्या व उजव्या हाताने डावा दंड पकडा.
5. मस्तक व कपाळ जमिनीकडे करा.
6. संपुर्ण शरीर शिथिल करा व सर्व अवयवांना आराम द्या.

फायदे :-

1. श्वासना प्रमाणेच या आसनामध्ये देखील हे आसन संपुर्ण शरीरास विश्रांती प्रदान करते.

पायावर उभे राहून करावयाची आसने :-

1. गरूडासन :-



शरीर हे गरूडासमान दिसते म्हणून याला गरूडासन म्हणतात.

कृती :-

1. दोन्ही पायांवर स्थिर उभे रहा.
2. उजवा पाय सरळ ठेवा.
3. डावा पाय उजव्या पायाच्या उजव्या बाजूने पाठीमागे घेवून विळखा घाला.
4. उजव्या हाताला डाव्या हाताचा विळखा घालून नमस्कार स्थितीत उभे रहा.
5. हेच डाव्या पायाला उजव्या पायाने करा.
6. शरीरातील विविध भागावरील ताण अनुभवण्याचा प्रयत्न करा.
7. साधारण आठ ते दहा सेकंदापर्यंत या स्थितीत रहा.
8. पुन्हा पुन्हा पाच ते सहा वेळा आवर्तन करा.

फायदे :-

1. पाय मजबुत होतात.
2. शारिरीक संतुलन राखण्याची कला अवगत होते.
3. मनोनिग्रह व एकाग्रता निर्माण करण्यासाठी हे आसन एक अत्यंत प्रभावी माध्यम आहे.

## 2. वृक्षासन :-



या आसनामध्ये शरीराची स्थिती झाडाप्रमाणे होते.

## कृती :-

1. कोणत्याही एका पायावर ताठ उभे रहा.
2. दुसरा पाय गुडघ्यात दुमडा व टाच डाव्या जांघेवर टेवा.
3. हळुहळु श्वास घेत दोन्ही हात हळुहळु डोक्याच्या वर घेवून कोपरात न वाकवलेल्या अवस्थेत डोक्यावर नमस्कार स्थितीत तळवे जोडा.
4. शांत चित्ताने हळुहळु श्वासउच्छ्वासास घेत रहा.
5. हीच कांती दुसऱ्या पायाने करा.
6. 5 ते 6 वेळा या आसनाची आवर्तने करा.

## फायदे :-

1. शारिरीक संतुलन निर्माण होणे.
  2. आपण पुन्हा पुन्हा केल्याने मनाची एकाग्रता वाढीस लागते.
3. उत्कटासन :-



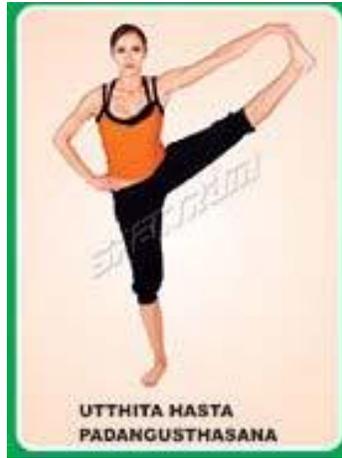
अनेक आसनापैकी हे एक महत्वाचे आसन.

कृती :-

1. दोन्ही पाय ताठ ठेवून उभे रहा.
2. दोन्ही हात डोक्यावर ताठ ठेवून नमस्कार स्थितीत आणा.
3. पाठ व डोक्यावरील हात ताठ ठेवून श्वास घेत गुडघे हळुहळु वाकवा.
4. मंद श्वास घेत आसनात स्थिर राहण्याचा प्रयत्न करा.
5. 10 ते 30 सेकंदा नंतर पुर्व स्थितीत या.

फायदे :-

1. पाय व मांडयाचे स्नायु मजबुत होतात.
  2. हाताचे व पायाचे तळव्यांचे स्नायु मजबुत होतात.
4. षादहस्तासन :-



पश्चिमोत्तानारून प्रमाणे हे आसन आहे. केवळ फरक इतकाच की हे आसन उभे राहून करावयाचे असते.

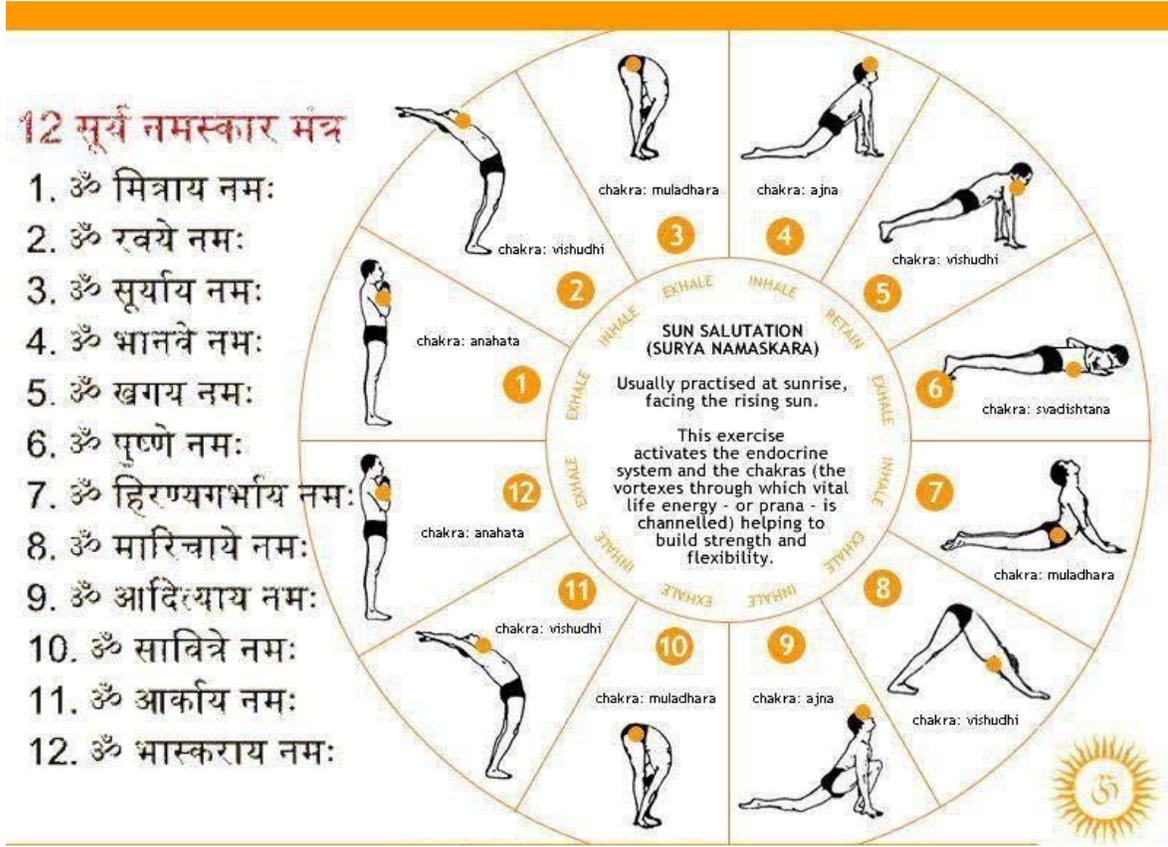
कृती :-

1. ताठ उभे रहा.
2. श्वास घेत दोन्ही हात वर करा.
3. श्वास सोडत हळुहळु कमरेत वाका. गुडघे ताठ ठेवा.
4. हात व पाय ताठ ठेवतच दोन्ही हाताचे तळवे दोन्ही पायांच्या तळव्यांच्या खाली ठेवण्याचा प्रयत्न करा.
5. हे आसन करताना नियमित सरावानेच जमु शकते.

फायदे :-

1. या आसना मुळे पोटाची चरबी कमी होते.
2. पश्चिमोत्ताना पासून मिळणारे सर्व फायदे या आसना मुळे देखील मिळतात.

सुर्यनमस्कार :-



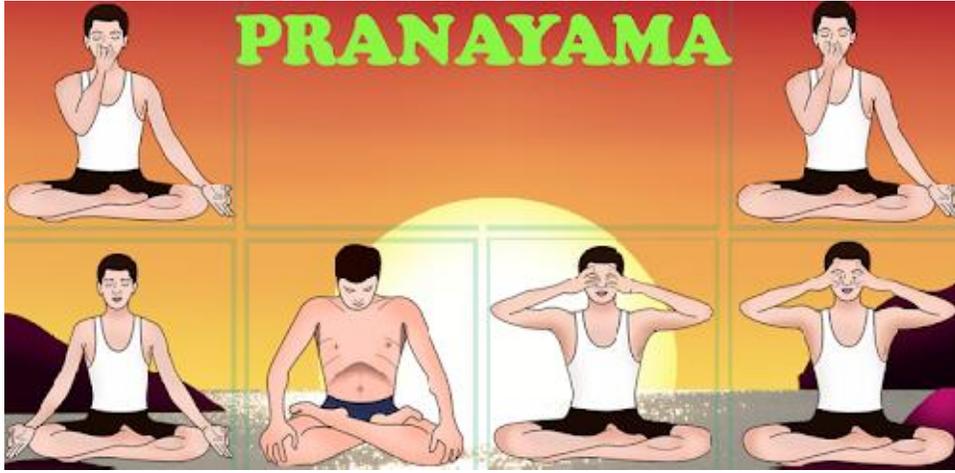
एक संपुर्ण आसन पध्दती म्हणजे सुर्य नमस्कार होय. अनेक आसनांचा समुच्चय सुर्य नमस्कारा मध्ये होतो. संपुर्ण शरीराला परीपुर्ण व्यायाम सुर्य नमस्कारा मुळे होतो. सुरुवातीस दोन सुर्यनमस्कारां पासुन सुरुवात करुन विदयार्थी शारिरीक क्षमते नुसार सुर्यनमस्कारांची संख्या व गती वाढवत नेऊ शकतो.

कृती :-

- 1) ताठ उभे रहा. खांदे सरळ, छाती विटासारखी ताठ ठेवा. दृष्टी सरळ.
- 2) दोन्ही हात छातीवर नमस्कार मुद्रेमध्ये एकमेकाना जोडलेले.
- 3) श्वास घेत दोन्ही हात वर घ्या.
- 4) हात वरच ठेवून कोपऱ्यात न वाकवता पाठीमागच्या बाजुस झुका.
- 5) हळुहळु श्वास सोडत शरीर कमरेतुन पुढच्या बाजुस वाकवत मस्तक गुडघ्याला चिकटवण्याचा प्रयत्न करा. पाय ताठ स्थित ठेवा आणि दोन्ही हातांचे तळवे दोन्ही पायां शेजारी जमिनीला टेकण्याचा प्रयत्न करा.
- 6) पुन्हा श्वास घेत डाव्या पायावर खाली बसत उजवा पाय पाठीमागे न्या. उजव्या पायाची चवड्याची व गुडघ्याची जागा जमिनीला लागु देत दोन्ही हातांचे तळवे जमिनीस स्पर्श करणारे तर डोके पाठीमागे झुकवलेले व नजर वर च्या दिशेने करा.

- 7) त्यानंतर डावा पाय देखील पाठीमागे घ्या आणि केवळ तळहात व तळपाय जमिनीला टेकवून कमरेत शरीर वर उचलून घेवून शरीराची कमान तयार करा.
- 8) त्यानंतर पुन्हा श्वास रोखून धरत जमिनीला टेकवा. छाती जमिनीला गुडघे टेकवा. पोट आत ओढा व पोट जमिनीला टेकवू नका. कपाळाचा वरचा भाग जमिनीला टेकवा. नाक टेकवू नका. हात छातीच्या बाजूला जमिनीला टेकवा.
- 9) यानंतर श्वास आत घेत छाती पुढे काढत दोन्ही हातावर दाब देत डोके व छाती वर उचला.
- 10) पुन्हा एकदा संपुर्ण शरीराचर कमान करा.
- 11) उजवा पाय दोन्ही हातांच्या मध्ये घ्या.
- 12) डावा पाय दोन्ही हातांच्या मध्ये घेवून कमरेत वाकलेला अवस्थेत कपाळ गुडघ्याला लावा.
- 13) सरळ उभे राहत दोन्ही हात नमस्कार मुद्रेत आणा.
- 14) हेच आसन डाव्या पायाने सुरुवात करून करा.
- 15) आपल्या शारिरीक क्षमतेनुसार सुर्य नमस्कारा पासुन हळुहळु वाढ करीत जा.

‘‘प्राणायाम’’



प्राणायाम म्हणजे प्राण शक्तीवर नियंत्रण होय. प्राणायाम आणि योगासनांचे अत्यंत जवळचे नाते आहे. सुखासन, पद्मासन किंवा वजासन या पैकी कोणत्याही आसनात स्थिर बसता आल्यानंतर प्राणायाम या पैकी कोणत्याही आसनात स्थिर बसता आल्यानंतरच प्राणायाम सुरु करावा. सुरुवातीला इतका वेळ स्थिर राहणे कठीण जाईल. परंतु सरावाने ते शक्य झाले पाहिजे.

प्राणायामामध्ये फुफ्फुसांचे पुष्कळ आकुंचन व प्रसरण योग्य प्रकारे झाल्याने फुफ्फुसे कार्यक्षम बनतात. फुफ्फुसे कार्यक्षम बनतात. विद्यार्थ्यांनी प्राणायामाचा अभ्यास हा तज्ञांच्या मार्गदर्शना खाली करावा.

1) श्वसन

- पुरक :- श्वास घेणे.
- रेचक :- श्वास सोडणे.
- कुंभक :- श्वास रोखणे.

1. संध श्वसन :-

शरीरामधील सर्व हालचाली थांबलेल्या असतात. मन शांत असते. त्यावेळी जे श्वसन सुरु असते. त्याला संध श्वसन म्हणतात. उदा :- श्वासन.

2. जलद श्वसन (दोन्ही नाकपुड्यांनी):—

पद्मासन किंवा सुखासनामध्ये बसुन श्वासाकडे मन एकाग्र करा. वेगाने श्वास आत घ्या. (पुरक) त्यानंतर वेगाने श्वास बाहेर सोडा (रेचक)

3. भस्त्रिका :-



### भस्त्रिका प्राणायाम

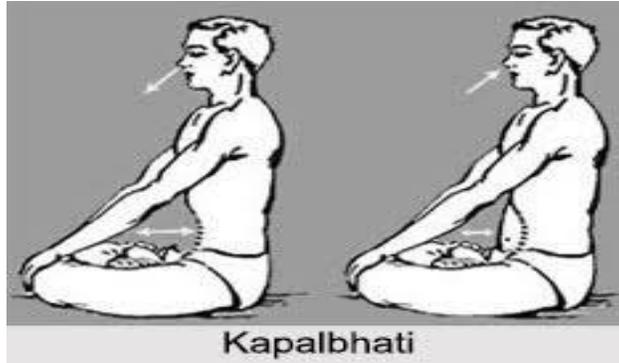
भस्त्रिका म्हणजे भट्टीचा भाता. लोहाराच्या भात्याप्रमाणे हवा फुफ्फुसामध्ये घेतली आणि बाहेर फेकली जाते.

भस्त्रिका कृती :-

1. सुखासनात किंवा पद्मासनामध्ये बसा.
2. हात गुडध्यावर ठेवा.
3. जोरात श्वास आत घ्या.
4. त्याच गतीने जोरात श्वास बाहेर काढा.
5. एक पुरक व एक रेचक याने भस्त्रिका प्राणायामाचे एक आवर्तन पूर्ण होईल.

अशा पध्दतीने किमान 20 वेळा सलग आवर्तन घेवून यांना विश्रांती नंतर दुसरे आवर्तन करू शकता. (हा प्राणायाम तज्ञ व्यक्तीच्या मार्गदर्शना खालीच करावा.)

4. कपालभाती :-



Kapalabhati

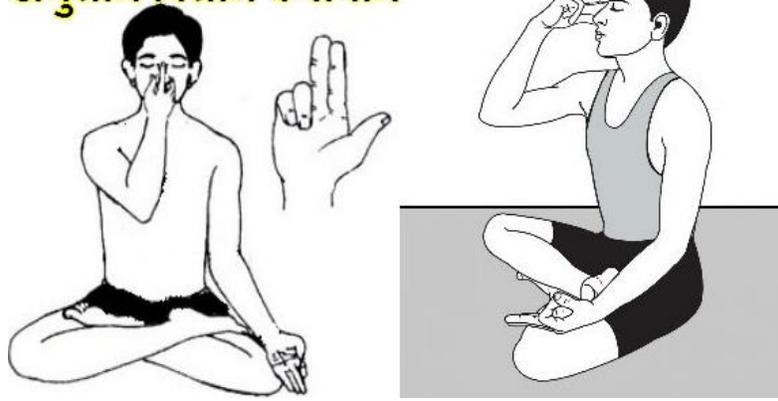
ही एक शुधी क्रिया आहे. याने मोठा मेंदु लहानमेंदु मज्जासंस्था यांचेवरील अनुकूल परिणाम होतो. साथनस शुध्द झाल्याने कपाळाला तेज येते म्हणून याला कपाल भाती म्हणतात.

कृती :-

1. सुखासन किंवा पद्मासनामध्ये बसा.
2. मंदश्वास घेवून श्वास पटल आणि पोटाचे स्नायु यांना आतल्या दिशेने धक्का देवून श्वास नाकाव्दारे बाहेर काढा. (पोटातून धक्कादेवून रेघक)
3. पोटाचे स्नायु ढिले सोडल्यानंतर नैसर्गिक श्वास घेतला जातो.(पूरक)
4. या प्रकारे हळुहळु आवर्तन करीत रहा.
5. नवीन विद्यार्थ्यांनी एका मिनिटांस 60 आवर्तने या प्रकारे आवर्तने तज्ञांच्या मार्गदर्शना खाली करावीत.

5. अनुलोम विलोम :-

### अनुलोम विलोम प्रणायाम



कृती :-

1. सुखासन किंवा पद्मासनामध्ये बसा.
2. उजव्या हाताने उजवी नाकापुडी बंद करा.
3. डाव्या नाकपुडीने श्वास आत घ्या.
4. अनानिकेते डावी नाकपुडी बंद करा व उजव्या नाकपुडीने श्वास बाहेर सोडा.
5. अनानिकेते डावी नाकपुडी बंद करा व उजव्या नाकपुडी ने श्वास घ्या.
6. उजवी नाकपुडी अंगडयाने बंद करा आणि डाव्या नाकपुडीने श्वास सोडा.
7. या प्रकारे मध्याम गतीने आवर्तन करा.
8. 20 ते 30 आवर्तने करून थांबा. (हा प्राणायाम तज्ञांच्या मार्गदर्शना खाली करावा.)

योगसाठी शाकाहार हाच आधार योग्य आहे. यांचे स्पष्टीकरण खालील प्रकारे देण्यात येईल.

शरीर रचना	मांसाहारी प्राणी उदा : वाघ, सिंह इ.	शाकाहारी प्राणी उदा : गाय, बैल इ.	मानव प्राणी
दाताची रचना	टोकदार सुळे लचके तोडणारे	पटाशीचे दात	जाड व पसरट
जबडयाचा सांधा	फक्त वर खाली बिजागरी सारखा	पुढे मागे व बाजूला हलणारा	पुढे मागे व बाजूला हलणारा
नखांची रचना	टोकदार	पसरट व रूंद	पसरट व रूंद
पाणी पिण्याची पध्दत	जिभेने पाणी पितात	ओठानी ओढून पाणी पितात	ओठानी ओढून पाणी पितात
रक्ताची रासायनिक स्थिती	आम्लतेकडे झुकणारी	अल्कलीकडे झुकणारी	अल्कलीकडे झुकणारी
घाम	घाम येत नाही.	घाम येतो.	घाम येतो.
आतडयाची लांबी	सहा फूट	तीस फूट	30 फूट

वरील तुलनात्मक बाबी वरून असे दिसून येते की, शाकाहारी प्राणी व मानव यांची शरीर रचना समान असलेने मानवाने शाकाहार घेणेच योग्य आहे.

4. अत्यंत तिखट, आंबट, खारट, गरम, शुष्क, दाहकारक असतो. असा आहार दुःख शोक आणि व्याधि निर्माण करतो. उदा : कट मिसळ, बटाटे वडा, पाव भाजी, चिवडा, फरसाण, चहा, कॉफी इ. अशा आहाराने पित्ताचे विकार, मुळ व्याध होण्याची शक्यता असते.

1. चौरस आहार :-

अन्न ही जीवनाचा महत्वाची गरज आहे. आपल्या शरीर पोषणाच्या दृष्टीने निरनिराहया नैसर्गिक अन्न पदार्थांचे त्यांच्या पोषण मुल्याच्या दृष्टीने सामावेश केलेल्या आहारास समतोल आहार किंवा चौरस आहार म्हणावा. चौरस आहारात खालील घटकांचा समावेश असावा.

2. 1.पिष्टमय पदार्थ, 2. स्निग्ध पदार्थ, 3. प्रथिने, 4. जीवनसत्त्वे, 5. क्षार, 6. पाणी.

3. म्हणजे आपल्या रोजच्या जेवनामध्ये चपाती, फुलके, भाकरी, एक वाटी कोशिंबीर, मॅलड, मोड आलेली धान्ये, एक वाटी पालेभाजी, भात, वरण, तूप, लिंबू यांचा दैनंदिन सामावेश असणे गरजेचे आहे.

आहाराच्या वेळा :-

दिवसाचा आहार सकाळी 10 ते 1 या कालावधीमध्ये घ्यावा. रोजची जेवनाची वेळ निश्चित असावी. त्यात रोज रोज बदल करू नयेत. सायंकाळचा आहार झोपण्यापूर्वी 3 तासापूर्वी घ्यावा. आहाराचे जठरामधील पचनास तीन तासाचा कालावधी लागतो. रात्री सात नंतर जेवल्यास झोपण्यापूर्वी अन्नाचे पचन होत नाही. त्यामुळे रात्री झोप व्यवस्थित लागत नाही. सकाळी मलविसर्जन योग्य वेळी होत नाही. त्यातूनच मलावरोधाचा विकार जडतो. अन्न योग्य रितीने न पचल्याने त्याचे चरबीमध्ये रूपांतर होते. त्यानं स्थूलता वाढते.

अर्ध पोट भरेल इतकच अन्नग्रहण करावे. जठराचा तिसरा भाग भरेल इतका द्रव आहार पाणी प्यावे. जठराचा चौथा भाग हवेकरिता मोकळा असावा. याचा अर्थ पोट गच्च भरून कधीच जेऊ नये.

नियमित मिष्टान्नाचे जेवन टाळावे :-

संध्या वारंवार साजरे होणारे समारंभा,पाटर्या,पाहुनचार,हॉटेल मधील जेवन, जेवना बरोबर आइस्क्रीम यामुळे आहारामध्ये श्रीखंड, बासुंदी, बर्फी, अशा मिठाईचे प्रमाण वाढत निघाले आहे. मिष्टान्नाचे जेवन घेणे हे श्रीमंतीचे लक्षण माणले जाते. परंतु अशी मिष्टान्ने वारंवार खाण्याचे पचन संस्थेवरती ताण येतो. त्यामुळे पचन संस्थेची कार्यक्षमता अकालीच कमी होते. त्यातूनच अपचनाचे विकार वाढीस लागतात.

अन्न पदार्थाचे तापमान :-

अन्न पदार्थ सेवन करतेवेळी ते कोमट (शरीराच्या तापमानाचे) असावेत फार गरम अथवा फार थंड पदार्थ सेवन करू नयेत. तसेच एकदा शिजविलेले अन्न परत गरम करू नये. त्यामुळे अन्न पदार्थांमधील जीवनसत्वे नाहिशी होतात

म्हणून योगाभ्यासाबरोबर “ युक्त आहार ” ची जोड दिली तर आपले जीवन खरोखरच सुखी व समृद्ध होईल.