SAVITRIBAI PHULE PUNE UNIVERSITY

(FORMERLY UNIVERSITY OF PUNE)

SYLLABUS FOR

MASTERS IN ARCHITECTURE

M.ARCH. (ENVIRONMENTAL ARCHITECTURE)

(To be implemented w.e.f. A.Y. 2019-20)

BOARD OF STUDIES IN ARCHITECTURE

FACULTY OF SCIENCE AND TECHNOLOGY

Semester III

SUBJECT TITLE: **ENVIRONMENTAL DESIGN STUDIO–III**				
Subject Code **: 2019EA301**				
Teaching Scheme		**Examination Scheme**	**Marks**	**Duration**
Theory Periods per week	2	Sessional	300	NA
Studio Periods per week	8	Viva/Oral	100	NA
Total Contact Periods (60 min period) per week	**10**	In-semester Examination	Nil	NA
		End-semester Examination	Nil	NA
Total Credits	**10**	**Total Marks**	**400**	**NA**

OBJECTIVE:

1. The purpose of this Studio is to understand sustainable development in urban / environmental planning projects where they will be able to apply the theoretical knowledge of environmental & sustainability planning to a specific project.
2. The Studio will look at sustainable development and address environmental issues arising in urban, rural or rur-urban areas and search for solutions under environmental planning.

COURSE CONTENTS:

Unit I: Environmental Assessments, Environmental Status Reporting and identification of environmental issues in urban, rural or rur-urban context.

Unit II: Conceptual master planning / structure plan for Sustainable Development.

Unit III: Detailed Micro planning for specific projects under the theme of Environmental Planning, which may include River front development, ecological restoration projects, sustainable urban design, Heritage conservation for sustainability, Sustainable City Development Strategies, resilience, climate sensitivity, etc.

SESSIONAL/TERM WORK

Identification of area of intervention, Concept presentations for the same, technical drawing portfolio and report to elaborate the sustainable design scheme.

OUTCOME:

At the end of the semester the students will be able to:

1. Identify environmental issues at a larger scale and provide appropriate planning solutions
2. Understand the process of environmental planning and its implementation

Recommended Readings

1. As recommended by faculty based on the exercise
2. Kevin Lynch, *Image of the City*

SUBJECT TITLE: **RESEARCH–II**				
Subject Code **: 2019EA302**				
Teaching Scheme		**Examination Scheme**	**Marks**	**Duration**
Theory Periods per week	2	Sessional - SS	100	NA
Studio Periods per week	1	Viva/Oral - SV	Nil	NA
Total Contact Periods (60 min period) per week	**3**	In-semester Examination	Nil	NA
		End-semester Examination	Nil	NA
Total Credits	**3**	**Total Marks**	**100**	**NA**

OBJECTIVE

1. To explore and study central issues related to environmental architecture from past, to the present day and future.
2. To enable the student to undertake a methodical research on a topic in environmental architecture and to communicate it through technical writing

COURSE CONTENTS

Unit I: The subject deals with selecting an appropriate topic from the field of environmental architecture or allied disciplines, for the theoretical exploration related and supportive to the selected dissertation topic.

The topic of the research paper could be selected in a such way that it could help to develop an appropriate methodology and research approach (but not restricted to) related to the Environmental Architecture Project taken up in semester-IV.

SESSIONAL/TERM WORK:

Research paper shall be prepared by each student based upon the topic approved by the institute in around 5000 words, in the format specified by the university. The paper has to adhere to the plagiarism norms as given by UGC and a plagiarism report will be attached as a part of the submission. A research seminar to be conducted internally at the end of the term which shall be mandatory for internal evaluation.

OUTCOME:

Students at the end of the semester should be able to undertake independent research in the field of environmental architecture and present it in the appropriate technical formats as required.

Recommended Readings

All books/ Journals/ Magazines/ unpublished thesis related to the topic selected by the individual student.

SUBJECT TITLE: **PRACTICAL TRAINING**				
Subject Code **: 2019EA303**				
Teaching Scheme		**Examination Scheme**	**Marks**	**Duration**
Theory Periods per week	2	Sessional (course sessional – 50, training portfolio – 100)	150	NA
Studio Periods per week	2	Viva/Oral	50	NA
Total Contact Periods (60 min period) per week	**4**	In-semester Examination	Nil	NA
		End-semester Examination	Nil	NA
Total Credits	**4**	**Total Marks**	**200**	**NA**

OBJECTIVE

To give an opportunity for learning and for development of skills related to practical aspects of the discipline of Environmental Architecture, by working in a professional firm.

COURSE CONTENTS

Unit I: Introduction to Professional practice – Ethics, code of conduct and liabilities as environmental architects, contracts and tenders. Professional fees, Role of various bodies and organizations like COA, IGBC etc., professional procedures, office management, project development,

Unit II: Approval processes, planning mechanisms and working structure associated with governmental organizations (MOEF, Municipal Corporations, CPCB etc.)

The Professional Training (40 full working days) is to be undertaken during intermediate time between II & III Semester. The Oral Assessment of the same will be held at the end of Semester III. The subject is included as core subject and will have both sessional and viva assessment. It involves working in a firm engaged in environmental architecture or planning related work in India or abroad. The Oral Assessment of the same will be held at the end of Semester III.

SESSIONAL/TERM WORK

Final submission will include compilation of the work done during the training in the form of A3 report and in the form of notes/journals/assignments done during the studio in Semester III. All hard copies need to be submitted with the signature of the head and the stamp of the firm, at the time of appearing for the viva-voce.

OUTCOME:

At the end of the semester the students will be able to understand practical aspects of the discipline of Environmental Architecture.

RECOMMENDED READINGS

1. Websites of various professional organization associated with the profession of Environmental Architecture

2. COA Handbook

SUBJECT TITLE: **SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT**				
Subject Code **: 2019EA304**				
Teaching Scheme		**Examination Scheme**	**Marks**	**Duration**
Theory Periods per week	2	Sessional	Nil	NA
Studio Periods per week	1	Viva/Oral	Nil	NA
Total Contact Periods (60 min period) per week	**3**	In-semester Examination	30	NA
		End-semester Examination	70	150 mins
Total Credits	**3**	**Total Marks**	**100**	**NA**

OBJECTIVE

1. To introduce the students with various scales and types of planning and develop an understanding of climate change mitigation measures.
2. To develop understanding of issues at neighbourhood scales and expose to the steps involved in sustainable urban design projects.
3. To introduce the concept of environmental planning and expose to the emerging concepts in sustainable planning like, smart city concept, eco-city concept, etc.
4. To introduce the students to the principles, need and methodologies of Environmental Impact Assessments.
5.To introduce students to Environmental Management Plan

COURSE CONTENTS

Unit I:

i) Introduction to planning and various planning standards like UDPFI etc.
ii) Theory and principles of sustainable planning

Unit II:

i) Issues and tools of Environmental policies and initiatives, sustainable urban design
ii) Introduction to the Theory of transportation planning, social planning, and principles of community participation in planning process along with social infrastructure planning (Chandigarh, Gandhinagar, Naya Raipur, Navi Mumbai, etc.)
iii) Introduction to services planning, planning for risk and disaster management etc.

Unit III:

i) Introduction to EIA and its legislative requirements
ii) Planning and Management of EIA with introduction to the process, impact prediction and assessment and reporting EIA studies.

Unit IV:

i) Introduction to Environmental Management Plan
ii) Implementation of environmental management systems

SESSIONAL/TERM WORK/ CONTINUOUS ASSESSMENT

Studies taken up by students individually and/or in groups will be presented and submitted along with compilation of study material in the form of reports/ notes/ assignments.

OUTCOME:
Students at the end of the semester should have learnt / understood:
1. The sustainable development and planning issues and its relevance in the current environmental practice
2. To understand EIA and EMP and its application in the context of design and planning

Recommended Readings

1. Stephen Wheeler; *Planning for Sustainability*,
2. Simon Presner, *Principles for Sustainability*
3. Cecilia Tacoli; *Urban Linkages*
4. Monto & Ganesh; *Sustainability by human settlements*
5. Sampson; *The WTO and sustainable development*
6. *Achieving sustainable cities in SE Asia region*
7. Antonio Layards; *Planning for Sustainable future*
8. D Farr; *Sustainable Urbanism*
9. Tifiin J; *Transport communications*
10. Brain; *Transport in Cities*
11. K.Lynch; *The Image of the City*, MIT Press
12. Edington John; *Ecology and Environmental Planning*
13. Alexander Christopher; *A pattern Language The Environment ,Public Health and Human Ecology consideration for Economic Development.*
14. Talwar; *Environmental management*,
15. Ramachandra; *Environmental management*
16. Petts Judith; *Handbook on Environmental Impact Assessment*
17. Y.Abbi & S.Jain; *Handbook on energy audit and environmental management*
18. Larry Canter, *Environmental Impact Assessment*
19. Recommended EIA Reports from MoEF website
20. MoEF, *Guidelines for EIA of Construction Projects*

SUBJECT TITLE: **BUILDING ENERGY MANAGEMENT–II**				
Subject Code **: 2019EA305**				
Teaching Scheme		**Examination Scheme**	**Marks**	**Duration**
Theory Periods per week	2	Sessional	Nil	NA
Studio Periods per week	1	Viva/Oral	Nil	NA
Total Contact Periods (60 min period) per week	**3**	In-semester Examination	30	NA
		End-semester Examination	70	150 mins
Total Credits	**3**	**Total Marks**	**100**	**NA**

OBJECTIVE

1. To introduce the supply side of energy and its integration with planning and design of buildings.
2. The purpose of this subject is to introduce the students, global energy scenario and various alternatives in renewable sources.
3. To introduce students to options of renewable resources and appropriate technologies for harnessing them for our benefit.

COURSE CONTENTS

Unit I: Energy Scenario – conventional and non conventional

Current global scenario, Global Energy related meets, Types of Energy sources used globally and in India, Identification of resources at country and state level.
Limitations, Environment related issues

Unit II: Renewable Energy Sources:

Types, Advantages, Potential of various renewable energy sources in Country, Uses at various levels: Country, City and building level

Unit III: Solar Energy

Potential, Technology, Limitations
Applications on generic level
Building integration applications

Unit IV: Wind Energy

Potential, Technology, Limitations
Applications on generic level
Building integration applications

Unit V: Bio Mass, Biofuels and Other resources

Potential, Technology, Limitations
Applications on generic level
Geothermal, Tidal, Mechanical Nuclear Energy, Cogeneration etc.
Alternative Fuels, CNG & LPG

SESSIONAL/TERM WORK/ CONTINUOUS ASSESSMENT

In-semester examination or continuous assessment for individual student and studies taken up by students individually and/or in groups will be presented in the form of reports/ notes/ assignments covering all the topics mentioned above with suitable examples, sketches and supportive material and submitted along with compilation of study material.

OUTCOME:

At the end of the semester the students will be able to:

1. Understand supply side of energy management
2. Integrate renewable energy technologies with planning and design of buildings.

Recommended Readings

1. R.K. Narang; *Cleaner is cheaper,* TERI
2. VV Kishore *;Renewable energy, engineering and technology,*TERI
3. Sophia and Stefen Behling; *Solar Power*
4. Martin Kalstchmitt; *Renewable Energy*
5. Ursula Eicher; *Solar technology and buildings*
6. Falk Antony; *Photovoltaic for Professionals*
7. Paul Gipe; *Wind Power*
8. *Renewable energy and Environment,* CEE Publication
9. Renewable energy technology development and implications, TERI
10. Sustainable building Manual, Vol 1 and 2, TERI
11. Energy its use and the environment-Biomass

Journals/Periodicals

12. Renewable energy
13. Solar Online
14.Down to Earth

SUBJECT TITLE: **ADVANCE TECHNOLOGY AND DESIGN LAB**				
Subject Code**: 2019EA306**				
Teaching Scheme		**Examination Scheme**	**Marks**	**Duration**
Theory Periods per week	1	Sessional	100	NA
Studio Periods per week	1	Viva/Oral	Nil	NA
Total Contact Periods (60 min period) per week	**2**	In-semester Examination	Nil	NA
		End-semester Examination	Nil	NA
Total Credits	**2**	**Total Marks**	**100**	**NA**

OBJECTIVE:

The objective is to provide hands-on training of advance design software and analysis tools. Emphasis will be to provide exposure to software of urban level monitoring and building level parametric design tools. These tools will assist students study urban microclimate analysis, parametric analysis at building level thermal and lighting analysis amongst others.

COURSE CONTENTS:

Unit 1: Urban Level Modelling Software – Urban level studies to understand microclimate, urban and environmental planning needs to be supported with urban level modelling programs and software. These tools will allow students to explore scenarios and environmental planning principles in details and project future urban scenarios for development.

Unit 2: Building Level Software- Apart from whole building simulation tools required for whole building performance analysis there are possibilities of individually exploring parametric environmental design tools which support design decisions. Students will be exposed to available tools in this domain which will provide a ground for analysis of designs projects.

SESSIONAL/TERM WORK:
Studies taken up by students individually and/or in groups will be presented and submitted along with compilation of study material in the form of reports and assignments. Lab studies are required to be done as part of the project assessment.

OUTCOME:
At the end of the semester the students will be able to:
Understand and use urban level and building level modeling software for performance analysis

Recommended Readings

1. Help Manuals
2. Video Tutorials

Semester IV

SUBJECT TITLE: **ENVIRONMENTAL ARCHITECTURE PROJECT (MAJOR)**				
Subject Code **: 2019EA401**				
Teaching Scheme		**Examination Scheme**	**Marks**	**Duration**
Theory Periods per week	4	Sessional	600	NA
Studio Periods per week	16	Viva/Oral	200	NA
Total Contact Periods (60 min period) per week	**20**	In-semester Examination	Nil	NA
		End-semester Examination	Nil	NA
Total Credits	**20**	**Total Marks**	**800**	**NA**

OBJECTIVE

To explore a practical or conceptual project related to environmental planning or design and to develop / conceptualise/ prepare a policy and/ or design level proposal for the same.

COURSE CONTENTS

The student has a choice to focus on the planning and policy aspect, or the project could culminate in the design of a sustainable built form.

1. To identify a project for independent study based on individual area of interest with reference to a topic in Environmental Architecture, in consultation with the faculty members.
2. To define and develop the project along with its significance, scope and limitations
3. Programming research related to the project and evolving the project brief
4. To conceptualise and prepare a project proposal and present it in graphical and textual format along with the documentation of the process.

SESSIONAL/TERM WORK

Final submission will be in the form of a document including report, computer simulation results and technical drawings if required. The work will be in the form of necessary drawings to explain the project and its details. A comprehensive report of the project and the related study, will be submitted which will include the above drawings.

RECOMMENDED READINGS

All books/ Journals/ Magazines/ unpublished/published research/websites related to the topic selected by the individual student.

OUTCOME:

Students at the end of the semester should be able to provide policy and/or design level output to projects related to environmental planning or design.

SUBJECT TITLE: **ELECTIVE III**				
Subject Code **: 2019EA402**				
Teaching Scheme		**Examination Scheme**	**Marks**	**Duration**
Theory Periods per week	1	Sessional	200	NA
Studio Periods per week	4	Viva/Oral	Nil	NA
Total Contact Periods (60 min period) per week	**5**	In-semester Examination	Nil	NA
		End-semester Examination	Nil	NA
Total Credits	**5**	**Total Marks**	**200**	**NA**

OBJECTIVE:

To expose the students in interdisciplinary area of their interest and impart them with theoretical knowledge and practical understanding of the subject offered in the elective.

COURSE CONTENTS:

Individual college may offer the students one or more topics, depending upon the availability of experts and resource material. The colleges will have the opportunity and choice to focus on one or more of the topics. Being an open interdisciplinary elective the topics offered for the elective shall be outside the core knowledge domain of architecture. The open elective would be offered by departments/schools other than architecture.

In case the topics offered cannot be conducted the students can take any one of the topics offered in either elective I or elective II but not opted for by the students earlier.

Detailed syllabus for the topics will be finalized by individual college in consultation with expert faculty, considering the time and marks allotted to the subject.

SESSIONAL/TERM WORK:

The mode of teaching learning shall be decided by the experts and the department where the elective is offered. The final outcome and submission shall be in form of report / journal/ model/ or any other form suitable for the topic studied.

OUTCOME:
Students at the end of the semester should have learnt / understood the broad idea and concept inherent in the subject as well as its application and importance in the field of environment.

RECOMMENDED READINGS:
As per the topic offered.