

Shri Vaishnav institute of Architecture

Choice Based Credit System (CBCS) Scheme in the light of NEP-2020 by COA

B. ARCH (2021-26)

COURSE CONTENT

ARCG 919: ELECTIVE – VII

														, , , , , , , , , , , , , , , , , , ,			
			λe			TEAC	HING S	CHEME			EV	ALUATION SC	HEMAE			s	(HRS
COURSE	ORE	E AREA	VPOLO						THEORY					STUDIO	MARK	ATION	
	^o	COURS	COURSET			T	s	CREDII	2 -TERAA EXAM 20%	TA 20%-Ok 30%	ESUE 40%0 k 50%	TOTAL	TA 10% Ok 50%	EV 10% Ok 50%	TOTAL	TOTAL	EX AM DUR.
THEORY/STUDIO						INT	EX		INT	EX							
ARCG 919	SEC	su	THEORY /STUDIO	ELECTIVE- VIII (POOL III)/ GENERIC			3	3	20	30	50	100	50		50	150	3

L - THEORY; S- STUDIO, T -TUTORIAL; C - CREDIT; HRS. HOURS; MST - MIDTERM TEST, A MST - AVERAGE OF MIDTERM, ESUE - END SEMESTER UNIVERSITY EXAMINATION; IA - INTERNAL ASSESSMENT PROGRESSIVE, SS- FOLIO FINAL Sessional (INTERNAL), EV - EXTERNAL VIVA VOICE, RVW - INTERMEDIATE REVIEW

ARCG 919: ELECTIVE – VII

Syllabus: 15 weeks (2 hours/week) Total Teaching hours: 30 Hrs.

ELECTIVE VII

9 sem

ENERGY-CONSCIOUS BUILT ENVIRONMENT

COURSE OBJECTIVE: overall nurturing of the student with issues in practice and field outside

COURSE OUTCOME:

EXPECTED SKILLS / KNOWLEDGE TRANSFERRED: better grooming than just books and theories.

9191

COURSE OVERVIEW:

The following is a representative list of what may constitute Institute projects: Seminars, Tutorials/ additional classes for any course, Guest Lectures, putting up Exhibitions, Workshops, participating in Architectural Competitions or conducting Site Visits or Study Tours.

- Provides knowledge to support students being sensitive to design;
- a paper presentation and a summer case study

COURSE CONTENTS: SR. NO. SYLLABUS: TOPIC SUBTOPIC

TEACHING G HOURS:

5 hrs @

each

class

- The creative electives provide an opportunity to express talents that are different from architecture but related to imagination, visualization & creation. They offer hands-on experience of unique ingenuity & workmanship. The essence of a creative domain can be achieved by exploring different materials, techniques, and processes; developing creative products; finishing & presenting the product for the concepts that evolved. The outcome will be through portfolio & presentations.
- As Per Pool Electives Choices Stage IV Odd semester pool

ENERGY-CONSCIOUS BUILT ENVIRONMENT

COURSE OBJECTIVES:

to change the way you think about energy and how this is spent within a building. to develop the knowledge, skills and competence in the field of energy-efficient and environmental buildings for different climates.

COURSE OUTCOME :

At the end of the course, students will be able to

- overall nurturing of the student with issues in practice and field outside better grooming than just books and theories.
- the student shall demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information

Chairperson	Chairperson	Controller of Examination	Joint Registrar
Board of Studies	Faculty of Studies	Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth
Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth	Vishwavidyalaya Indore	Vishwavidyalaya Indore
Vishwavidyalaya,Indore	Vishwavidyalaya Indore		



Shri Vaishnav institute of Architecture

Choice Based Credit System (CBCS) Scheme in the light of NEP-2020 by COA

B. ARCH (2021-26)

COURSE CONTENT

H ARCG 919: ELECTIVE - VII																		
	COURSE			GΥ			TEAC	HINGS	CHEME	EVALUATION SCHEME							s	I (HRS]
		ORE	E AREA	VPOLO						THEORY STUDIO						MARK	ATION	
		5	COURS	COURSET	NAME OF THE COURSE	L	. т	r s	CREDIT	2 -TERAA Exam 20%	TA 20%-Ok 30%	ES UE 40%/0 k 50%	TOTAL	TA 10%:Ok 50%	EV 10%-0 k 50%	TOTAL	TOTAL	EXAMDUR
	THEORY/STUDIO							INT	EX		INT	EX						
	ARCG 919	SEC	su	THEORY /STUDIO	ELECTIVE- VIII (POOL III)/ GENERIC			3	3	20	30	50	100	50		50	150	3

L - THEORY; S- STUDIO, T -TUTORIAL; C - CREDIT; HRS. HOURS; MST - MIDTERM TEST, A MST - AVERAGE OF MIDTERM, ESUE - END SEMESTER UNIVERSITY EXAMINATION; IA - INTERNAL ASSESSMENT PROGRESSIVE, SS-FOLIO FINAL Sessional (INTERNAL), EV - EXTERNAL VIVA VOICE, RVW - INTERMEDIATE REVIEW

 demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work
 EXPECTED SKILLS / KNOWLEDGE TRANSFERRED:

All you need is an interest in energy-efficient construction.

Sustainable designs and related theory.

designing buildings whilst having energy efficiency in mind is gradually gaining ground over the last few decades. As the future is approaching and the energy production mix is radically changing towards more sustainable sources, it is apparent that **energy efficiency will be a driving factor in the construction industry**.

COURSE OVERVIEW:

instil an interest and an "energy efficiency" mentality in the student.

the student shall - demonstrate knowledge and understanding of the main field of study, including both broad knowledges of the field. COURSE CONTENTS:

SR. NO.	SYLLABUS: TOPIC	SUBTOPIC	TEACHING HOURS:
		 The course addresses energy use in buildings and the environmental impact considering three essential dimensions. Human comfort and health, Strategies and systems, Whole building design (building type and scale) and process. to promote the integration of strategies and systems with building design, taking into consideration all human comfort parameters (thermal, olfactory, visual and acoustic) at all scales of intervention from materials components-systems to small-scale buildings (houses) or large buildings (e.g. office buildings, libraries, shopping malls). 	
		Climate & shelter	
		Overview of the different Passive Solar Techniques &Climate responsive design features adopted in the traditional/vernacular architecture of various places in different climate zones – Control of Micro-climate around the building by settlement pattern, built form – open space relationship & façade articulation & appropriate use of building materials in historic buildings.	
		Energy efficiency basics	
		A few words about energy efficiency	
		Types of energy sources	
		Actual energy costs	
		Energy uses in a household	
		Energy efficiency basics.	
		Energy Use and Thermal Comfort in Buildings	
		Moisture Safety Design	
		Introduction to the building onvolope	
		Airtightness laver	
		Wind & weather tightness laver	
		wind a weather lightness layer	

ChairpersonChairpersonController of ExaminationJoint RegistrarBoard of StudiesFaculty of StudiesShri Vaishnav VidyapeethShri Vaishnav VidyapeethShri Vaishnav VidyapeethShri Vaishnav Vidyalaya, IndoreVishwavidyalaya IndoreVishwavidyalaya IndoreShri Vaishnav Vidyapeeth



Shri Vaishnav institute of Architecture

Choice Based Credit System (CBCS) Scheme in the light of NEP-2020 by COA

B. ARCH (2021-26)

COURSE CONTENT

ARCG 919: ELECTIVE - VII

COURSE	CORE		×9			TEAC	HINGS	CHEAAE			EV	ALUATION SC	HEAAE			<i>s</i>	Jupo
		E AREA	VPOLO						THEORY					STUDIO		MARK	NOL
		COURS	COURSET	NAME OF THE COURSE	L	T	\$	CREDIT	2 -TERM EXAM 20%	TA 20%08 30%	ES UE 40%/0 k 50%	TOTAL	TA 10% Ok 50%	EV 10%: O k 50%	TOTAL	TOTALI	EXAMDUR
THEORY,	/STUDI	0							INT	EX		INT	EX	7			
ARCG 919	SEC	su	THEORY /STUDIO	ELECTIVE- VIII (POOL III)/ GENERIC			3	3	20	30	50	100	50		50	150	

L - THEORY; S- STUDIO, T -TUTORIAL; C - CREDIT; HRS. HOURS; MST - MIDTERM TEST, A MST - AVERAGE OF MIDTERM, ESUE - END SEMESTER UNIVERSITY EXAMINATION; IA - INTERNAL ASSESSMENT PROGRESSIVE, SS-FOLIO FINAL Sessional (INTERNAL), EV - EXTERNAL VIVA VOICE, RVW - INTERMEDIATE REVIEW

Recap, openings & thermal bridges

The building envelope	
Passive House - Integrating Thermal and Moisture Issues	
Ventilation	
Ventilation and Indoor Air Quality	
Daylighting and Lighting of Buildings	
Energy-Efficient Office Building – Integrating Daylight and	
Ventilation	
Mechanical ventilation with heat recovery	
Hot water systems	
Hot water	
Heating & cooling	
Heating	
Cooling	
Country DASSIVE SOLAD LEATING Constraints Direct agin	
PASSIVE SOLAR HEATING General principles - Direct gain	
systems - Glazed Walls, Bay Windows, Attached Sulispaces etc.	
Transwell, Deef pend, Deef rediction tran. Solarium eta, keletad	
apin systems - Natural convective loop ate Case studies on	
buildings designed with passive heating techniques	
PASSIVE COOLING CONCEPTS Conoral principles Evaporative	
cooling Nocturnal radiation cooling Passive Designant cooling	
induced ventilation earth sheltering Berming Wind Towers earth	
- Air tunnels Curved Roofs & Air Vents Insulation Vary Thermal	
walls atc. Case studies on buildings designed with passive cooling	
techniques	
Light - Perception uses & sources	
Introduction to light	
Basic uses of light	
Davlight in the built environment	
Light sources	
Lighting requirements for different activities	
Light - Perception, uses & sources	
Energy consumed by appliances	
A few words about the Passive House Institute	
Alternative energy sources	
Building Integrated Solar Energy Systems	
Life-Cycle Perspective and Environmental Impact of Buildings	
Public Building – Integrating Solar Energy, Costs and	
Environmental Issues	
Degree project in Energy-Efficient and Environmental Buildings	
SOLAR ENERGY & BUILDING Solar geometry and built form -	8hrs
Various techniques of shading to reduce heat gain in a tropical	
climate -Various methods of Maximizing exposure to solar	
radiation in cold & temperature climates. Heating & cooling loads	
- Energy estimates - Energy conservation - Efficient daylighting -	

ChairpersonChairpersonController of ExaminationJoint RegistrarBoard of StudiesFaculty of StudiesShri Vaishnav VidyapeethShri Vaishnav VidyapeethShri Vaishnav VidyapeethShri Vaishnav Vidyalaya,IndoreVishwavidyalaya IndoreVishwavidyalaya IndoreVishwavidyalaya Indore



Shri Vaishnav institute of Architecture

Choice Based Credit System (CBCS) Scheme in the light of NEP-2020 by COA

B. ARCH (2021-26)

COURSE CONTENT

ARCG 919: ELECTIVE - VII

COURSE			β			TEAC	HING	SCHEME			EV	ALUATION SC	HEMAE			s	(HRS]
	JRE	E AREA	VPOLO		ι				THEORY				STUDIO			MARK	ATION
	ŏ	COURS	COURSET	NAME OF THE COURSE		T	\$	CREDI	2 -TERAA EXAM 20%	TA 20%,0k 30%	ESUE 40%-0 k 50%	TOTAL	TA 10% Ok 50%	EV 10%: O k 50%	TOTAL	TOTAL	EX AM DUR
THEORY/STUDIO							INT	EX		INT	EX						
ARCG 919	SEC	SU	THEORY /STUDIO	ELECTIVE- VIII (POOL III)/ GENERIC			3	3	20	30	50	100	50		50	150	3

L - THEORY; S- STUDIO, T -TUTORIAL; C - CREDIT; HRS. HOURS; MST - MIDTERM TEST, A MST - AVERAGE OF MIDTERM, ESUE - END SEMESTER UNIVERSITY EXAMINATION; IA - INTERNAL ASSESSMENT PROGRESSIVE, SS-FOLIO FINAL Sessional (INTERNAL), EV - EXTERNAL VIVA VOICE, RVW - INTERMEDIATE REVIEW

Solar Water heating system. Exercises in heating and cooling load

calculations in buildings.

OVERALL DESIGN CONCEPTS Landform & orientation -8hrs

Vegetation & Pattern - Water Bodies - Open Space & Built from -

Plan form & Elements - Roof form - Fenestration pattern

& Configuration - Building envelope & finishes.

NOTE:-Emphasis should be laid on understating the Principle that continuous evaluation shall be made of students' work based on various models, assignments and sketching

SUGGESTED READINGS:

A general description of the calculation tools for Cost-Benefit Analysis and Life Cycle Assessment of very low-energy houses. IVL, 2010. **Abel E, Elmroth A:** Buildings and Energy - a systematic approach, T6:2007. FORMAS, 2007, **Åke Biomsterberg:** Barriers to implementation of very low energy residential buildings and how to overcome them. Lund University, 2011.

American Institute of Architects (AIA): AIA Guide to Building Life Cycle Assessment in Practice. 2010. Arvind Krishnan & Others – Climate Responsive Architecture, Tata Mcgraw –Hill New Delhi 2001.

Bill Baker - How to beat the Energy Crisis and Still Live in Style - G.P. Putnam's Sons, Newyork 1979. Economic and environmental impact assessment of very low-energy house concepts in the North European countries. IVL, 2011.

George Basid& Others – Energy Performance of Bldg – CRC Press, Florida 1984. Hagentoft C-E: Introduction to Building Physics. Studentlitteratur, 2005, Identification of tools for cost-benefit and LCC analysis and success factors for very low-energy housing. 2010. IVL, 2010.

IEA Task 41: Solar Energy Systems in Architecture Integration Criteria and guidelines. International Energy Agency (IEA), 2012. The report can be downloaded at http://archive.iea-shc.org/publications/downloads/T41A2-Solar_Energy_Systems_in_Architecture-19sept2012.pdf

IVL: Economic and environmental impact assessment of very low-energy house concepts in the North European countries. 2011. J.K Nayak&Others, Energy Systems Energy Group,- Isa Annal Of Passive Solar Architecture.

James D. Ritchie – Successful Alternate Energy Methods – Structures Publishing Co. Michigan 1980. Lars Andrén: Solar installations, Practical applications for the built environment. James & James Science Publishers, 2003,

Lechner, Norbert: Heating, Cooling, Lighting, Sustainable Design Methods for Architects. Wiley, 2014 MiliMajunder, Teri – Energy – Efficient Bldg in India – Thomson Press, New Delhi – 2001

Mohamad Monkiz Khasreen, Phillip F.G. Banfill and Gillian F. Menzies: Life-Cycle Assessment and the Environmental Impact of Buildings: A Review.

Ralph M . Lebens – Passive Solar Architecture in Europe – 2, Architecture Press, London 1983. Sartori, I.& Hestnes, A.: Energy use in the life cycle of conventional and low-energy buildings: A review article. Elsevier, 2007.

T. Agami Reddy, Jan F. Kreider, Peter S. Curtiss, Ari Rabl: Heating and Cooling of Buildings: Principles and Practice of Energy Efficient Design, Third Edition.

CRC Press, 2016

The Commitch group, editor Nilsson PE: Achieving the desired indoor climate. Studentlitteratur, 2003, Yuanhui Zhang: Indoor Air Quality Engineering. CRC Press, 2004, ISBN: 9781566706742. Reference book

Chairperson

Board of Studies Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Chairperson Faculty of Studies Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

Controller of Examination

Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore

Joint Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore