NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR

PROPOSED NEW SCHEME OF EXAMINATION FOR

TEN SEMESTER INTEGRATED COURSE OF B. ARCH.(APPLICABLE FROM 2010-11)

FOURTH SEMESTER

S.No.	Subject Code	Subject	Periods per week			Scheme of Examination			Total Marks	Credit [L+{(T+P)/2}]
			L	**T**	**P**	**ESE**	**FE/ SE**	**TA**		
1	1411	Architectural Design IV	2	0	0	0	50	100	150	2
2	1412	Building Construction and Technology IV	2	0	0	70	30	75	175	2
3	1413	Structural Design and Systems IV	3	2	0	70	30	20	120	4
4	1414	Surveying and Levelling	2	1	3	70	30	20	120	4
5	1415	Human Settlements and Vernacular Architecture	3	0	0	70	30	30	130	3
6	1416	History of Architecture, Art and Culture II	2	1	0	70	30	50	150	3
7	1421	Architectural Design IV Studio	0	0	6	50	0	0	50	3
8	1422	Building Construction and Technology IV Studio	0	0	3	25	0	0	25	2
9	1427	Energy Efficient Architecture	0	0	2	30	0	0	30	1
10	1428	Measure Drawing & Study Tour	0	0	1	0	0	30	30	1
11	1429	Discipline						20	20	1
TOTAL			**14**	**4**	**15**	**455**	**200**	**345**	**1000**	**26**

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Subject Code	Subject	Periods per week			Scheme of Examination			Total Marks	Credit [L+{(T+P)/2}]
		L	T	P	ESE	FE / SE	TA		
1411	**Architectural Design-IV**	2	0	0	0	50	100	150	2

This subject aims at developing in students the skill to design building and small settlements with consideration to natural and manmade parameters. The assignments shall be Design of independent bungalows, farmhouses, combined units, duplex type and their cluster or grouping etc. along with relevant Building codes.

The design shall be handled with study of natural environmental factors, their impact and consideration by human settlements of a town or a part of a city, especially housing along with the study of Open spaces, activities in them. Emphasis on aspects like – climatic considerations and relationship with life style, consideration of design detailing in kitchens, toilets etc.

Two time problems (as class tests) are to be conducted in class other than regular design problems.

Note:

Sessional will be in the form of drawings and models along with project report for the design dealt. The evaluation shall be done in intermediate reviews consisting of internal and external experts. There should be regular site visits / case studies of buildings, so as to document them with the help of photographs, slides, etc.

References:

1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Professional 2001.
2. Julius Panero, Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design, 1975
3. Joseph De Chiara, Julius Panero, Martin Zelnik, Time Saver Standards for Interior Design and Space Planning, McGraw Hill 2001.
4. Ernst Neuferts Architects Data, Blackwell 2002
5. Ramsey et al, Architectural Graphic Standards, Wiley 2000
6. Richard P. Dober, Campus Planning
7. Kanvinde, Campus Planning in India
8. Kevin Lynch, Site planning, MIT Press, Cambridge, 1967
9. Sam F. Miller, Design Process: A Primer for Architectural and Interior Design, Van Nostrand Reinhold, 1995

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Subject Code	Subject	Periods per week			Scheme of Examination			Total Marks	Credit [L+{(T+P)/2}]
		L	T	P	ESE	FE / SE	TA		
1412	**Building Construction and Technology IV**	2	0	0	70	30	75	175	2

UNIT 1	**Shoring:** • Raking. • Flying. • Dead.
UNIT 2	**Special flooring and roofing:** • Industrial steel floor. • Fire proof roofing / flooring. • R.C.C. roof with timber flooring. • Stone slab roofing. • Stone floor on girder support.
UNIT 3	**Built in furniture:** • Wardrobe • Cupboard • Kitchen cabinet • Shelf, • Showcases • Bookshelf , racks, almirahs, etc.
UNIT 4	**Balconies and Stairs:** • Balconies in R.C.C. • Steel balconies. • Stairs (steel and timber).
UNIT 5	**Canopies:** • Designing of Porch, Canopies in R.C.C. and steel (including tubular). • Designing of Covered ways in steel & R.C.C. • Fixing details of lighting fixtures, rain water drainage systems, etc. in canopy.

Note:

1. There shall be regular site visits to buildings, under construction or Constructed, to explain the above topics. Use of audio-visuals should be stressed.
2. Sessional work shall be done as scaled drawings on drawing sheets and freehand drawings along with occasional visits to construction sites.
3. In theory examination there will be a separate question from each unit with choice within the unit/question. All units/questions will be compulsory.

References:

1. Don A. Watson, “Construction Materials and Processes”, McGraw Hill, 1972.
2. W.B. McKay, “Building Construction” Vol, 1 to 4, Longmans, UK, 1981.
3. S.C Rangwala “Building Construction” Charotar Publishing House, India, 2000
4. S.K.Sharma, “A Text book of Building Construction”, S.Chand & Co Ltd., New Delhi, 1998
5. American Institute of Timber Construction (AITC), Timber Construction Manual, Wiley Publishers, 2004
6. Francis D.K Ching Building Construction illustrated, John Willey & Sons, 2000
7. Wills H Wagner, Howard Bud, Modern Carpentry, Good Heart – Wilcox publishers, Portland, 2003
8. Barry, Construction of Buildings, Volume 1to 5, Blackwell Publishing Ltd., Oxford, 2005

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		L	T	P	ESE	FE / SE	TA		
1413	**Structural Design and Systems - IV**	3	2	0	70	30	20	120	4

R.C.C. STRUCTURE DESIGN – I (L.S.M)

UNIT 1	Analysis and design of singly and doubly reinforced beam.
UNIT 2	Design of flanged beam.
UNIT 3	Design of slab (one way & two way)
UNIT 4	Design of axially loaded column and column footing (Isolated)
UNIT 5	Design of stair cases (Dog legged and open well)

Note:
1. I.S. code 456 is permitted in examination.
2. Sessionals work shall include assignments/tests on the above topics.
3. In theory examination there will be a separate question from each unit with choice within the unit/question. All units/questions will be compulsory.

References:

1. S.N. Sinha, Reinforced Concrete Design – Tata McGraw Hill Publishing Co. Ltd.,New Delhi, 1998.
2. Shah, Reinforced Concrete, Vol. 1 and 2 – Charotar Publishing House, Anand, 1998.
3. P.Dayaratnam, Design of Reinforced Concrete Structures, Oxford and IBH Publishing Co., 1983.
4. C. Sinha and S.K. Roy, Fundamentals of Reinforced Concrete, S.Chand & Co., New Delhi, 1983.
5. Dr. B.C. Punmia, Reinforced Concrete Structures, Vol, 1 & 2 Laxmi publication, Delhi, 1994.
6. IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
7. S. Unnikrishnan Pillai and Devados Menon, Reinforced Concrete Design – Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1999.

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Subject Code	Subject	Periods per week			Scheme of Examination			Total Marks	Credit [L+{(T+P)/2}]
		L	T	P	ESE	FE / SE	TA		
1414	**Surveying and Leveling**	2	1	3	70	30	20	120	4

UNIT 1	**Introduction of surveying:** • Aspects of surveying for the Architect. • Formulae used in measurement of land with geometrical and abstract configurations to work out Areas, volumes and other quantities.
UNIT 2	**Chain survey:** • Instrument used. • Selection of survey station. • Chain line, Offset, oblique offset, tie line, check lines, ranging. • Field book plotting.
UNIT 3	**Levelling:** • Various parts of dumpy level. • Temporary adjustment. • Interrelationship of bubble tube axis. • Line of collimation and vertical axis. • Levelling staff, technical term used in levelling. • Fly levelling (study of reciprocal levelling). • Introduction of contouring.
UNIT 4	**Plain table surveying:** • Introduction. • Equipment required. • Working with plain table. • Errors in plain table. • Advantage and disadvantage.
UNIT 5	**Construction surveying:** • Introduction. • Equipment for setting out. • Horizontal and vertical control. • Setting out a pipe line. • Setting out a building and structure (complete layout). • Staking out a highway.

Note:

1. Class work and fieldwork of the above subject should be oriented towards the layout of buildings and preparation of measured drawings. Students should also be taken to site visits for explaining the practical aspects of surveying.
2. Sessional work should include reports, drawings, and experiments etc. in assignment seminar form.
3. In theory examination there will be a separate question from each unit with choice within the unit/question. All units/questions will be compulsory.

References:

1. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1967.
2. B.C.Punmia - Surveying Vol.I - Standard Book House, New Delhi - 1983.
3. Edward. T. Q. Site Analysis – Architectural Media, 1983.
4. P.B.Shahani - Text of surveying Vol.I, Oxford and IBH Publishing Co – 1980
5. Joseph De.Chiarra and Lee Coppleman - Planning Design Criteria - Van Nostrand Reinhold Co.,
6. Storm Steven, Site engineering for landscape Architects, John wiley & Sons Ine, 2004.
7. Development Control Rules – CMDA.

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		L	T	P	ESE	FE / SE	TA		
1415	**Human Settlements and Vernacular Architecture**	3	0	0	70	30	30	130	3

UNIT 1	**Human Settlements-I** • Early human settlements — Causal factors and pattern of development. • Human settlements of River valleys civilization (e.g. Indus-valley civilization, Egyptian civilization, etc.) • Early Vedic civilization patterns. • Canonical patterns as per various Indian texts.
UNIT 2	**Human Settlements-II** • Human settlements during ancient Greek period. • Human settlements during ancient Roman period. • Human settlements during Medieval period (Western and Indian). • Human settlements in India during Islamic period.
UNIT 3	**Human Settlements-III** • Human settlements during Renaissance period. • Effects of Industrial Revolution on planning of cities (history and present scenario). • Human Settlements in India during colonial period.
UNIT 4	**Modern Human Settlements** • Modern planning concepts.— oriental and occidental. (For example, Garden city, Satellite townships, neighbourhood planning, Utopian concepts, various philosophies, etc.) • Study of new towns and towns developed after industrial revolution.
UNIT 5	**Vernacular Architecture** • Introduction and characteristics of vernacular architecture. • Materials and techniques of construction in vernacular architecture. • Study of vernacular architecture for various regions in India.

Note:
1. Sessional shall be in the form of reports, seminars and notes on above mentioned topics.
2. In theory examination there will be a separate question from each unit with choice within the unit/question. All units/questions will be compulsory.

References:

1. Dutt B.B (1925) Town Planning in Ancient India, Thacker Spink & Co., Calcutta.
2. Mumford L (1961) The city in History, har court, Brace, and World, New York
3. Combaire J (1959) How cities Grew, The Florham Press, Madison, N.J.
4. Kosambi D.D. (1920) , The Culture and Civilisation of ancient Indian historical outline, Vikas publishing Home Pvt. Ltd. Delhi.
5. Sjoberg G (1960) The Preindustrial city, the Force Press, new York.
6. Combaire J (1959) How cities Grew, The Florham Press, Madison, N.J.
7. TAylor G (1949) Urban Geography, methucn, London
8. Pirenne H (1925) Medieval cities, Princeton Press
9. Dickinson R.E. (1961) The West European City, Routledge and Kegan Paul ltd., London
10. R W Brunskill: Handbook on Vernacular Architecture

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Subject Code	Subject	Periods per week			Scheme of Examination			Total Marks	Credit [L+{(T+P)/2}]
		L	T	P	ESE	FE / SE	TA		
1416	**History of Architecture, Art and Culture- II**	2	1	0	70	30	50	150	3

UNIT 1	**History of Arts and Culture -II:** • Development of Arts after Medieval Period—Oriental (Renaissance, Gothic, Rococo, Baroque and modern) • Development of Arts After Medieval — Occidental (Early Islamic, Mughal, Colonial, modern)
UNIT 2	**Western Classical Architecture** —Greek and Roman (with examples from temples, public buildings, palaces etc.) • Orders • Visual Corrections • Construction techniques
UNIT 3	**Brahmanical and Jain Architecture**: (with examples from temples, public buildings, palaces etc.) • North Indian • South Indian
UNIT 4	**Christian Architecture (Churches)** • Early Christian • Byzantine
UNIT 5	**Romanesque and Gothic (Churches)** • Study of various European styles with construction techniques, aesthetical principles, architectural philosophy.

Note:
1. Course would be run through lectures, Audiovisuals and site visits to various buildings.
2. Sessional shall be in the form of small reports, seminars, Sketches on above-mentioned topics.
3. The discussions should be based on selected examples highlighting the aesthetical values, architectural features, construction techniques, materials used and philosophy of construction.
4. In theory examination there will be a separate question from each unit with choice within the unit/question. All units/questions will be compulsory.

References:

1. Sir Banister Fletcher, A History of Architecture, University of London, The Antholone Press, 1996.
2. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press, London, 1985.
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
4. Percy Brown, Indian Architecture (Buddhist and Hindu Period), Taraporevala and Sons, Bombay, 1983.
5. Satish Grover, The Architecture of India (Buddhist and Hindu Period), Vikas Publishing Housing Pvt. Ltd., New Delhi, 2003.
6. Christoper Tadgell, The History of Architecture in India from the Dawn of civilization to the End of the Raj, Longmon Group U.K.Ltd., London, 1990.

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		L	T	P	ESE	FE / SE	TA		
1421	**Architectural Design-IV Studio**	0	0	6	50	0	0	50	3

The subject is a lab (studio) oriented subject and hence, the syllabus as specified in Architectural Design-IV (1411) will be the same. The works done as sessionals will be evaluated by internal and external examiners at the end semester examination. For conduction of the practical (viva-voce) examination one external and one internal examiner may be appointed for a group of 15-20 students.

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		L	T	P	ESE	FE / SE	TA		
1422	**Building Construction and Technology-IV Studio**	0	0	3	25	0	0	25	2

The subject is a lab (studio) oriented subject and hence, the syllabus as specified in Building Construction and Technology-IV **(**1412**)** will be the same. The works done as sessionals will be evaluated by internal and external examiners at the end semester examination. For conduction of the practical (viva-voce) examination one external and one internal examiner may be appointed for a group of 15-20 students.

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		L	T	P	ESE	FE / SE	TA		
1427	**Energy Efficient Architecture**	0	0	2	30	0	0	30	1

1. Types, availability and reserves of conventional and non-conventional energy sources.

2. Assessment of energy consumption in a building and methods of energy conservation: -

   (a) Through minimizing wastages.
   (b) Through appropriate use of climatology
   (c) Through appropriate design and planning of buildings.

3. Introduction to solar energy efficient architecture, Study of solar radiation on earth surface. Measurement, angles, estimation and analysis, Orientation of building, with reference to solar radiation. Special design and planning detailing. Active solar architecture. Passive solar architecture.

4. Introduction to wind oriented architecture, study and analysis of micro level wind. Design and planning of building considering winds.

5. Study of energy efficient building material and construction techniques. Case study national and international examples. Studio problem.

Note:
Sessional work should include reports, drawings, and experiments etc. in assignment seminar form.

References:

1. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi - 1999
2. Arvind Krishnan & Others, Climate Responsive Architecture, A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001
3. Fuller Moore, Environmental Control Systems, McGraw Hill INC, New Delhi - 1993
4. Sophia and Stefan Behling, Solpower, the Evolution of Solar Architecture, Prestel, New York, 1996
5. Givoni .B, Passive and Low Energy Cooling of Buildings, Van Nostrand Reinhold, New York, 1994

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		L	T	P	ESE	FE / SE	TA		
1428	**Measure Drawing and Study Tour**	0	0	1	0	0	30	30	1

Educational tours to the places of architectural interest shall be organized as per the programme approved by the department. The documentation shall be done in the form of photographs / slides and sketches presented in form of a seminar and written report immediately after the tour.

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		L	T	P	ESE	FE / SE	TA		
1429	**Discipline**	–	–	–	–	–	20	20	1

The marks of this subject are based on the yearly performance, behaviour, conduct, active participation, discipline and attendance of the students.