10 YEARS OF UNIVERSITY RECOGNITION
20 YEARS OF ACADEMIC EXCELLENCE

REVA UNIVERSITY
Bengaluru, India

SCHOOL OF ARCHITECTURE

B.ARCH. HANDBOOK

2018 - 2023 BATCH

RUKMINI EDUCATIONAL
Charitable Trust

www.reva.edu.in

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Chancellor's Message

"Education is the most powerful weapon which you can use to change the world."

- Nelson Mandela.

There was a time when survival depended on just the realization of physiological needs. We are indeed privileged to exist in a time when 'intellectual gratification' has become indispensable. Information is easily attainable for the soul that is curious enoughto go look for it. Technological boons enable information availability anywhere anytime. The difference, however, lies between those who look for information and those who look for knowledge.

It is deemed virtuous to serve seekers of knowledge and as educators it is in the ethos at REVA University to empower every learner who chooses to enter our portals. Driven by our foundingphilosophy of 'Knowledge is power', we believe in building a community of perpetual learners by enabling them to look beyond their abilities and achieve what they assumed impossible.

India has always been beheld as a brewing pot of unbelievable talent, acute intellect and immense potential. All it takes to turn those qualities into power is a spark of opportunity. Being at a University is an exciting and rewarding experience with opportunities to nurture abilities, challenge cognizance and gain competence.

For any University, the structure of excellence lies in the transitional abilities of its faculty and its facility. I'm always in awe of the efforts that our academic board puts in to develop the team of subject matter experts at REVA. My faculty colleagues understand our core vision of empowering our future generation to be ethically, morally and intellectually elite. They practice the art of teaching with a student-centered and transformational approach. The excellent infrastructure at the University, both educational and extra-curricular, magnificently demonstrates the importance of ambience in facilitating focused learning for our students.

A famous British politician and author from the 19th century - Benjamin Disraeli, once said 'A University should be a place of light, of liberty and of learning'. Centuries later this dictum still inspires me and I believe, it takes team-work to build successful institutions. I welcome you to REVA University to join hands in laying the foundation of your future with values, wisdom and knowledge.

Dr. P. Shyama Raju
The Founder and Hon'ble Chancellor, REVA University

Vice-Chancellor's Message

The last two decades have seen a remarkable growth in higher education in India and across the globe. The move towards inter-disciplinary studies and interactive learning have opened up several options as well as created multiple challenges. India is at a juncture where ahuge population of young crowd is opting for higher education. With the tremendous growth of privatization of education in India, the major focus is on creating a platform for quality in knowledge enhancement and bridging the gap between academia and industry.

A strong believer and practitioner of the dictum "Knowledge is Power", REVA University has been on the path of delivering quality education by developing the young human resources on the foundation of ethical and moral values, while boosting their leadership qualities, research culture and innovative skills. Built on a sprawling 45 acres of green campus, this 'temple of learning' has excellent and state-of-the-art infrastructure facilities conducive to higher teaching-learning environment and research. The main objective of the University is to provide higher education of global standards and hence, all the programs are designed to meet international standards. Highly experienced and qualified faculty members, continuously engaged in the maintenance and enhancement of student-centric learning environment through innovative pedagogy, form the backbone of the University.

All the programs offered by REVA University follow the Choice Based Credit System (CBCS) with Outcome Based Approach. The flexibility in the curriculum has been designed with industry-specific goals in mind and the educator enjoys complete freedom to appropriate the syllabus by incorporating the latest knowledge and stimulating the creative minds of the students. Bench marked with the course of studies of various institutions of repute, our curriculum is extremely contemporary and is a culmination of efforts of great think-tanks - a large number of faculty members, experts from industries and research level organizations. The evaluation mechanism employs continuous assessment with grade point averages. We believe sincerely that it will meet the aspirations of all stakeholders – students, parents and the employers of the graduates and postgraduates of Reva University.

At REVA University, research, consultancy and innovation are regarded as our pillars of success. Most of the faculty members of the University are involved in research by attracting funded projects from various research level organizations like DST, VGST, DBT, DRDO, AICTE and industries. The outcome of the research is passed on to students through live projects from industries. The entrepreneurial zeal of the students is encouraged and nurtured through EDPs and EACs.

REVA University has entered into collaboration with many prominent industries to bridge the gap between industry and University. Regular visits to industries and mandatory internship with industries have helped our students. REVA University has entered into collaboration with many prominent industries to bridge the gap between industry and University. Regular visits to industries and mandatory internship with industries have helped our students become skilled with relevant to industry requirements. Structured training programs on soft-skills and preparatory training for competitive exams are offered here to make students more employable. 100% placement of eligible students speaks the effectiveness of these programs. The entrepreneurship development activities and establishment of

"Technology Incubation Centers" in the University extend full support to the budding entrepreneurs to nurture their ideas and establish an enterprise.

With firm faith in the saying, "Intelligence plus character –that is the goal of education" (Martin Luther King, Jr.), I strongly believe REVA University is marching ahead in the right direction, providing a holistic education to the future generation and playing a positive role in nation building. We reiterate our endeavor to provide premium quality education accessible to all and an environment for the growth of over-all personality development leading to generating "GLOBAL PROFESSIONALS".

Welcome to the portals of REVA University!

Dr. S. Y. Kulkarni

Vice-Chancellor, REVA University

PREFACE

"*A great building must begin with the immeasurable, must go through measurable means when it is being designed, and in the end must be unmeasured". – Louis Kahn*

"Architecture is bound to situation. In a strange way, architecture is really an unfinished thing, because even though the building is finished, it takes on a new life. It becomes part of a new dynamic: how people will occupy it, use it, think about it." - Daniel Libeskind.

Above two quotes call for greater ability to analyze, synthesize and evaluate building design factors in order to produce efficient and effective architectural design solutions which satisfy performance, production and procurement criteria.

Architecture can be described as the design of the human environment, mostly buildings, groups of buildings and often the spaces between the buildings. The design, the documentation of designs, the inspection of the construction of buildings, their urban context, their gardens, their interiors and sometimes their furniture - all form part of the activities of the architect. Architectural design projects range in size and complexity from small alterations for a single house to large, multi-level commercial, industrial or public buildings and building complexes or even parts of cities.

Architects are expected to develop and practice a wide variety of skills. Apart from design and planning skills, architects should have technical, problem-solving, managerial, communication, co-ordination and entrepreneurial abilities too. Since not every person would possess all these skills, architects will have to work in groups bringing together experts with different skills and thereby the project undertaken gains greater success as each one would concentrate on those aspects in which he/ she is best. However, this requires team spirit, coordination and cooperative work culture.

Persons in the architectural profession serve clients, who might need buildings for themselves, or who could represent users, e.g. hospitals, schools, community centers or private corporations. They assist clients in drawing up a brief plan for their needs with the assistance of quality surveyors, engineers and project managers. They then prepare design schemes and models, cost projections, project documentation, submit sanction plans for approval by the authorities, acquire tenders and then administer the building contract. Besides time spent in office, the architects do site visits and are in constant contact with clients and coordinate with many disciplines active in the building process.

The B. Arch program in REVA University is designed keeping in view the current situation highlighted above and possible future developments, both at national and global levels. The Scheme of Instruction and Curriculum is prepared by the Board of Studies consisting of notable architects, designers and

scholars in the field and allied fields. Greater emphasis is laid on studio practice, field study and tutorials.

The B Arch program of the university intends to teach students apart from other things, the conceptualization of designs, test assumptions, evaluation of results and refinement of craft. Students will have access to electives drawn from across disciplines in art, digital design, sustainability and urban design. This flexibility is supported by a rigorous core program of core units in studios, history and theory, communications, technology and design workshops. Students will be given an exposure to the areas of building materials, photography, painting, sculpture, public art and more. The program aims to improve student's aesthetic judgments and facilitate with exposure to a wide range of techniques and media.

The program is to be under CBCS and CAGP system where students will have opportunity to choose the subjects of their interest from wide era of subjects as soft core study and open elective.

The personal and professional interests in architecture are matched by our faculty discipline-leading research, providing manifestation of contemporary issues throughout the degree. Our well qualified, experienced and committed faculty will guide you, monitor your progress, mould you and make your study interesting and fruitful. Exciting opportunities will be available for students to expand studio experience, participate in design and build projects and leverage the knowledge and skills of proficient teachers. The facilities for curricular and co-curricular activities in REVA with dedicated supportive staff provide you conducive ambiance for learning.

As architects must also be aware of the social context in which their designs are created, interpreted and understood, teaching to students will not be limited to architectural practice, instead induces to be responsive and adaptive thinkers who can produce designs that meet clients' needs as well as cater to larger environmental concerns.

The university fully understands that engagement with these professionally relevant aspects of the architectural profession is what will make our graduates highly sought-after and our alumni, industry leaders.

Dr. Vimala Swamy
Director
School of Architecture

RUKMINI EDUCATIONAL CHARITABLE TRUST

It was the dream of late Smt. Rukmini Shyama Raju to impart education to millions of underprivileged children as she knew the importance of education in the contemporary society. The dream of Smt. Rukmini Shyama Raju came true with the establishment of Rukmini Educational Charitable Trust (RECT), in the year 2002. **Rukmini Educational Charitable Trust** (RECT) is a Public Charitable Trust, set up in 2002 with the objective of promoting, establishing and conducting academic activities in the fields of Arts, Architecture, Commerce, Education, Engineering, Environmental Science, Legal Studies, Management and Science & Technology, among others. In furtherance of these objectives, the Trust has set up the REVA Group of Educational Institutions comprising of REVA Institute of Technology & Management (RITM), REVA Institute of Science and Management (RISM), REVA Institute of Management Studies (RIMS), REVA Institute of Education (RIE), REVA First Grade College (RFGC), REVA Independent PU College at Kattigenahalli, Ganganagar and Sanjaynagar and now REVA University. Through these institutions, the Trust seeks to fulfill its vision of providing world class education and create abundant opportunities for the youth of this nation to excel in the areas of Arts, Architecture, Commerce, Education, Engineering, Environmental Science, Legal Studies, Management and Science & Technology.

Every great human enterprise is powered by the vision of one or more extraordinary individuals and is sustained by the people who derive their motivation from the founders. The Chairman of the Trust is Dr. P. Shyama Raju, a developer and builder of repute, a captain of the industry in his own right and the Chairman and Managing Director of the DivyaSree Group of companies. The idea of creating these top notched educational institutions was born of the philanthropic instincts of Dr. P. Shyama Raju to do public good, quite in keeping with his support to other socially relevant charities such as maintaining the Richmond road park, building and donating a police station, gifting assets to organizations providing accident and trauma care, to name a few.

The Rukmini Educational Charitable Trust drives with the main aim to help students who are in pursuit of quality education for life. REVA is today a family of ten institutions providing education from PU to Post Graduation and Research leading to PhD degrees. REVA has well qualified experienced teaching faculty of whom majority are doctorates. The faculty is supported by committed administrative and technical staff. Over 11,000 students study various courses across REVA's three campuses equipped with exemplary state-of-the-art infrastructure and conducive environment for the knowledge driven community.

ABOUT REVA UNIVERSITY

REVA University has been established under the REVA University Act, 2012 of Government of Karnataka and notified in Karnataka State Gazette No. 80 dated 27thFebruary, 2013. The University is empowered by UGC to award degrees any branch of knowledge under Sec.22 of the UGC Act. The University is a Member of Association of Indian Universities, New Delhi. The main objective of the University is to prepare students with knowledge, wisdom and patriotism to face the global challenges and become the top leaders of the country and the globe in different fields.

REVA University located in between Kempegowda International Airport and Bangalore city, has a sprawling green campus spread over 45 acres of land and equipped with state-of-the-art infrastructure that provide conducive environment for higher learning and research. The REVA campus has well equipped laboratories, custom-built teaching facilities, fully air-conditioned library and central computer centre, the well planned sports facility with cricket ground, running track & variety of indoor and outdoor sports activities, facilities for cultural programs. The unique feature of REVA campus is the largest residential facility for students, faculty members and supportive staff.

The University is presently offering 23 Post Graduate Degree programs, 20 Degree and PG Degree programs in various branches of studies and has 12000+ students studying in various branches of knowledge at graduate and post graduate level and 302 Scholars pursuing research leading to PhD in 18 disciplines. It has 800+ well qualified, experienced and committed faculty members of whom majority are doctorates in their respective areas and most of them are guiding students pursuing research leading to PhD.

The programs being offered by the REVA University are well planned and designed after detailed study with emphasis with knowledge assimilation, applications, global job market and their social relevance. Highly qualified, experienced faculty and scholars from reputed universities / institutions, experts from industries and business sectors have contributed in preparing the scheme of instruction and detailed curricula for this program. Greater emphasis on practice in respective areas and skill development to suit to respective job environment has been given while designing the curricula. The Choice Based Credit System and Continuous Assessment Graded Pattern (CBCS – CAGP) of education has been introduced in all programs to facilitate students to opt for subjects of their choice in addition to the core subjects of the study and prepare them with needed skills. The system also allows students to move forward under the fast track for those who have the capabilities to surpass others. These programs are taught by well experienced qualified faculty supported by the experts from industries, business sectors and such other organizations. REVA University has also initiated many supportive measures such as bridge courses, special coaching, remedial classes, etc., for slow learners so as to give them the needed

input and build in them confidence and courage to move forward and accomplish success in their career. The University has also entered into MOUs with many industries, business firms and other institutions seeking their help in imparting quality education through practice, internship and also assisting students' placements.

REVA University recognizing the fact that research, development and innovation are the important functions of any university has established an independent Research and Innovation division headed by a senior professor as Dean of Research and Innovation. This division facilitates all faculty members and research scholars to undertake innovative research projects in engineering, science & technology and other areas of study. The interdisciplinary-multidisciplinary research is given the top most priority. The division continuously liaisons between various funding agencies, R&D Institutions, Industries and faculty members of REVA University to facilitate undertaking innovative projects. It encourages student research projects by forming different research groups under the guidance of senior faculty members. Some of the core areas of research wherein our young faculty members are working include Data Mining, Cloud Computing, Image Processing, Network Security, VLSI and Embedded Systems, Wireless Censor Networks, Computer Networks, IOT, MEMS, Nano- Electronics, Wireless Communications, Bio-fuels, Nano-technology for coatings, Composites, Vibration Energies, Electric Vehicles, Multilevel Inverter Application, Battery Management System, LED Lightings, Renewable Energy Sources and Active Filter, Innovative Concrete Reinforcement, Electro Chemical Synthesis, Energy Conversion Devices, Nano-structural Materials, Photo-electrochemical Hydrogen generation, Pesticide Residue Analysis, Nano materials, Photonics, Nana Tribology, Fuel Mechanics, Operation Research, Graph theory, Strategic Leadership and Innovative Entrepreneurship, Functional Development Management, Resource Management and Sustainable Development, Cyber Security, General Studies, Feminism, Computer Assisted Language Teaching, Culture Studies etc.

The REVA University has also given utmost importance to develop the much required skills through variety of training programs, industrial practice, case studies and such other activities that induce the said skills among all students. A full-fledged Career Development and Placement (CDC) department with world class infrastructure, headed by a dynamic experienced Professor & Dean, and supported by well experienced Trainers, Counselors and Placement Officers.

The University also has University-Industry Interaction and Skill Development Centre headed by a Senior Professor & Director facilitating skill related training to REVA students and other unemployed students. The University has been recognised as a Centre of Skill Development and Training by NSDC (National Skill Development Corporation) under Pradhan Mantri Kaushal Vikas Yojana. The Centre conducts several add-on courses in challenging areas of development. It is always active in facilitating student's variety of Skill Development Training programs.

The University has collaborations with Industries, universities abroad, research institutions, corporate training organizations, and Government agencies such as Florida International University, Okalahoma State University, Western Connecticut University, University of Alabama, Huntsville, Oracle India Ltd, Texas Instruments, Nokia University Relations, EMC^2, VMware, SAP, Apollo etc, to facilitate student exchange and teacher–scholar exchange programs and conduct training programs. These collaborations with foreign universities also facilitates students to study some of the programs partly in REVA University and partly in foreign university, viz, M.S in Computer Science one year in REVA University and the next year in the University of Alabama, Huntsville, USA.

The University has also given greater importance to quality in education, research, administration and all activities of the university. Therefore, it has established an independent Internal Quality division headed by a senior professor as Dean of Internal Quality. The division works on planning, designing and developing different quality tools, implementing them and monitoring the implementation of these quality tools. It concentrates on training entire faculty to adopt the new tools and implement their use. The division further works on introducing various examination and administrative reforms.

To motivate the youth and transform them to become innovative entrepreneurs, successful leaders of tomorrow and committed citizens of the country, REVA organizes interaction between students and successful industrialists, entrepreneurs, scientists and such others from time to time. As a part of this exercise great personalities such as Bharat Ratna Prof. C. N. R. Rao, a renowned Scientist, Dr. N R Narayana Murthy, Founder and Chairman and Mentor of Infosys, Dr. K Kasturirangan, Former Chairman ISRO, Member of Planning Commission, Government of India, Dr. Balaram, Former Director IISc., and noted Scientist, Dr. V S Ramamurthy, Former Secretary, DST, Government of India, Dr. V K Aatre, noted Scientist and former head of the DRDO and Scientific Advisor to the Ministry of Defence Dr. Sathish Reddy, Scientific Advisor, Ministry of Defence, New Delhi and many others have accepted our invitation and blessed our students and faculty members by their inspiring addresses and interaction.

As a part of our effort in motivating and inspiring youth of today, REVA University also has instituted awards and prizes to recognize the services of teachers, researchers, scientists, entrepreneurs, social workers and such others who have contributed richly for the development of the society and progress of the country. One of such award instituted by REVA University is ‘Life Time Achievement Award’ to be awarded to successful personalities who have made mark in their field of work. This award is presented on occasion of the “Founders’ Day Celebration” of REVA University in presence of dignitaries, faculty members and students gathering and the first “REVA Life Time Achievement Award” for the year 2015 has been awarded to Shri. Kiran Kumar, Chairman ISRO on the occasion of

Founder's Day Celebration, 6th January, 2016 and the second "REVA Life Time Achievement Award" for the year 2016 has been awarded to Shri. Shekhar Gupta, Renowned Journalist on the occasion of Founder's Day Celebration, 6th January, 2017.

REVA organises various cultural programs to promote culture, tradition, ethical and moral values to our students. During such cultural events the students are given opportunities to unfold their hidden talents and motivate them to contribute innovative ideas for the progress of the society. One of such cultural events is REVAMP conducted every year. The event not only gives opportunities to students of REVA but also students of other Universities and Colleges. During three days of this mega event students participate in debates, Quizzes, Group discussion, Seminars, exhibitions and variety of cultural events. Another important event is Shubha Vidaaya, - Graduation Day for the final year students of all the programs, wherein, the outgoing students are felicitated and are addressed by eminent personalities to take their future career in a right spirit, to be the good citizens and dedicate themselvesto serve the society and make a mark in their respective spheres of activities. During this occasion, thestudents who have achieved top ranks and won medals and prizes in academic, cultural and sports activities are also recognised by distributing awards and prizes. The founders have also instituted medals and prizes for sports achievers every year. The physical education department conducts regularyoga classes everyday to students, faculty members, administrative staff and their family members andorganises yoga camps for villagers around.

Recognizing the fast growth of the university and its quality in imparting higher education, the BERG (Business Excellence and Research Group), Singapore has awarded BERG Education Award 2015 to REVA University under Private Universities category. The University has also been honoured with many more such honors and recognitions

ABOUT SCHOOL OF ARCHITECTURE

The School of Architecture has highly experienced faculty members specialized in Architecture and allied fields and supported by well experienced architects as visiting faculty members. The school has the state-of-the-art class rooms and well equipped laboratories, drawing and seminar halls, museum space and construction yard. Supported by DivyaSree a noted Infrastructure Development Group, there are lot of opportunities for students to visit, to study, to share and experience on site teaching - learning. The school offers B Arch program. The curriculum of graduate degree program has been designed to bridge the gap between industry – academia and hence it is practical oriented. The B. Arch program aims to prepare human resources to play a leading role in the competitive architecture and construction field and excel in their endeavors. The program also focuses on research and design in the core and allied fields like Interior design, architectural design, climatology, etc., to create a sustainable world and to enhance the global quality of life by adopting enhanced techniques of design and application. This is reflected in various core subjects offered in the program.

Vision

"The School aspires to become innovative architectural school by preparing creative, committed, explorative architects with leadership qualities and research culture"

Mission

To create a team of competent young Architects of high caliber committed to their profession with ethics who can contribute to Architecture and allied fields in optimizing the usage of resources globally making the world more eco-friendly to live in.

ACADEMIC OBJECTIVES

- To groom ARCHITECTURE graduates to excel in their professional career and contribute with commitment and dedication to the progress of the society and the nation;
- To prepare graduate with a solid foundation in basics of architectural design and technical skills needed to analyze and design competitive structures;
- To engage in holistic learning, understanding, and practicing new evolving concepts and technologies in modern infrastructure field, to keep them tuned with the emerging techniques;
- To distinguish the professional careers of our graduates and post graduates with a high degree of moral, ethical, legal and professional obligations to protect human health, human welfare, and the environment;
- To prepare architecture graduates and post graduates to successfully address open-ended problems applying critical thinking and to become team leaders;
- To encourage students to gain professional visibility through publications, presentations, patents and thereby to become architects of distinction; and
- To provide a creative and energizing environment where in students will proactively take part in inter-disciplinary, team-oriented activities which will develop their team spirit and also prepare them for future endeavors in whichever field they choose.

ADVISORY BOARD

S. No.	Name	Designation
1	Ar. Dinesh Verma	Managing Director, Ace Group Architects Pvt. Limited, Bangalore
2	Ar. Itty. Zachariah	Managing Director, Zacharia Consultants, Bangalore
3	Ar. Jaisim Krishna rao	Managing Director, Fountainhead, Former Chairman, Indian Institute of Architects
4	Ar. H.C.Thimmaiah	Managing Director, Thimmaiah Associates, Ex-President Indian Institute of Architects, Bangalore
5	Ar. H.S. Anantharaman	Managing Director, Anantharam Associates, Visiting Faculty, MSRIT, Bangalore
6	Ar. Bindumadhav	Former Dean, School of Architecture, Mysore University, Mysore
7	Ar. Vidyadhar Wodeyar	Managing Director, Arch Plan, Former Chairman, Indian Institute of Architects, Bangalore

Summary of REVA University Regulations for Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) for B Arch Degree Programs.

1. **Teaching and Learning Process:**

The teaching & learning process under CBCS – CAGP of education in each course of study will have four components, namely**:**

(i) L= Lecture (ii) T= Tutorial (iii) P=Practice,; where:

L stands for **Lecture** session consisting of classroom instruction.

T stands for **Tutorial** session consisting participatory discussion / self study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture classes.

P stands for **Practice** session and it consists of Hands on Experience / Laboratory Experiments / Field Studies / Case Studies that equip students to acquire the much required skill component.

2. **Courses of Study and Credits**

a. The study of various subjects in B Arch degree program are grouped under various courses. Each of these course carries credits which are based on the number of hours of teaching and learning.

b. In terms of credits, every **one hour session of L amounts to 1 credit per Semester.** In terms of credits, every **one hour session of L amounts to 1 credit per Semester** and a minimum of **two hour session of T or P amounts to 1 credit per Semester or a three hour session of T / P amounts to 2 credits** over a period of one Semester of 16 weeks for teaching-learning process.

c. The total duration of a semester is 20 weeks inclusive of semester-end examination.

d. **A course shall have either or all the four components.** That means a course may have only lecture component, or only practical component or combination of any two or all the three components.

e. The total credits earned by a student at the end of the semester upon successfully completing the course are L + P + D. **The credit pattern of the course is indicated as L: P: D.**

3. **Courses of Study periods of Study and Courses of Examination Under Choice Based Credit System For the B.Arch degree Program**

1.0 Under the choice based credit system, which is a student centric/learner centric system, the courses of study in the B.Arch degree program shall be as under: Different Courses of studyare labeled and defined as follows:

a. Core course:

A course which should compulsorily be studied by a candidate as a core-requirement is termed as a **Core course.** The CORE courses of Study are of FOUR types, viz – (i) Professional Core Course (PC), (ii) Basic Sciences & Applied Engineering (BS & AE) (iii)Electives Courses –professional Elective (PE), and (Open Elective (OE), (iv) Professional Ability Enhancement Courses(PAECC) and Skill Enhancement Courses (SEC).

- **Professional Core (PC) Course:** A Course, which should compulsorily be studies by a candidate as a core requirement is termed as a core course.
- **Basic Sciences and Applied Engineering (BS & AE) Course:** A Course which informs the professional core and should compulsorily be studied.
- **Elective Course:** Generally a course which can be chosen from a pool of courses and are of two types:

(i) **Professional Elective (PE):** Which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope.

(ii) **Open Elective (OE):** Which enables an exposure to some other discipline/subject/domain or natures the candidate's proficiency/skill.

- **Employability Enhancement Courses (EECC):** which may be of two kinds: Employability Enhancement Compulsory Courses (EECC) and skill Enhancement Courses (SEC).

b. Project Work / Dissertation:

Project work / Dissertation is a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A project work carrying **FOUR or SIX** credits is called **Minor Project** work / **Dissertation.** A project work of **EIGHT, TEN, TWELVE or SIXTEEN** credits is called **Major Project** work / **Dissertation**. **A Minor Project work may be a hard core or a Soft Core as decided by the BoS / concerned. But the Major Project / Dissertation shall be Hard Core.**

4. Scheme, Duration and Medium of Instructions:

a. B Arch degree program is of 10 semesters - 5 years duration. A candidate can avail a maximum of 20 semesters - 10 years as per double duration norm, in one stretch to complete B Arch degree, including blank semesters, if any. Whenever a candidate opts for blank semester, he/she has to study the prevailing courses offered by the School when he/she resumes his/her studies.

b. The medium of instruction shall be English

5. Minimum Credits to be Earned

5.1 A candidate has to earn minimum of 260 credits for successful completion of B Arch degree with the distribution of credits for different courses as prescribed by the university. A candidate can enroll for a maximum of 32 credits and a minimum of 20 credits per

Semester. However he / she may not successfully earn a maximum of 32 credits per semester. This maximum of 32 credits does not include the credits of courses carried forward by a candidate.

5.2 Only such full time candidates who register for a minimum prescribed number of credits in each semester from I semester to X semester and complete successfully 240 credits in 10 successive semesters shall be considered for declaration of Ranks, Medals, Prizes and are eligible to apply for Student Fellowship, Scholarship, Free ships, and such other rewards / advantages which could be applicable for all full time students and for hostel facilities.

5.3 Add- on Proficiency Certification:

To acquire **Add on Proficiency Certification** a candidate can opt to complete a minimum of 4 extra credits either in the same discipline /subject or in different discipline / subject in excess to 240 credits for the B Arch Degree program.

5.3.1 Add on Proficiency Diploma:

To acquire **Add on Proficiency Diploma,** a candidate can opt to complete a minimum of 18 extra credits either in the same discipline /subject or in different discipline / subject in excess to 240 credits for the B Arch Degree program.

5.3.2 The A**dd on Proficiency Certification / Diploma** so issued to the candidate contains the courses studied and grades earned.

6. Scheme of Assessment & Evaluation for Three year Degree Programs

6. 1. The Scheme of Assessment and Evaluation will have two parts, namely;

i. Internal Assessment (IA); and
ii. Semester End Examination (SEE)

6.2. Assessment and Evaluation of each Course shall be for 100 marks. The Internal Assessment (IA) and Semester End Examination (SEE) of UG non engineering programs and PG programs shall carry 50 marks each (i.e., 50 marks internal assessment; 50 marks semester end examination).

6.3. The 50 marks of Internal Assessment (IA) shall comprise of:

Internal Test	= 30 marks
Assignments	= 10 marks
Seminars	= 10 marks

6.4. There shall be **three internal tests** conducted as per the schedule given below. T**he students have to attend all the three tests compulsorily.**

- 1st test for 15 marks at the end of 5th week of the beginning of the Semester;
- 2nd test for 15 marks at the end of the 10th week of the beginning of the Semester; and
- 3rd test for 15 marks at the end of the 15th week of the beginning of the Semester.

6.5. The coverage of syllabus for the said three tests shall be as under:

- For the 1st test syllabus shall be 1st unit and 1st half of Second Unit of the Course;
- For the 2nd test it shall be 2nd half of Second Unit and Third Unit of the Course;
- For the 3rd test the syllabus will be 4th Unit of the Course.

6.6. Out of 3 tests, the average shall be considered while assessing the performance of the students.

6.7. There shall be two Assignments and two Seminars each carrying 5 marks. Hence two assignments carry 10 marks (5+5 marks) and two seminars carry 10 marks (5+5 marks) as stated at Sl.No. 3 above.

6.8. The Semester End Examination for 50 marks shall be held during 19th and 20th week of the beginning of the semester and **the syllabus for the semester end examination shall be entire 4 units**.

6.9. The **duration of the internal test shall be 90 minutes and for semester end examination the duration shall be 3 hours.**

7. Evaluation of Practical / Studio Courses

7.1 A practical examination shall be assessed on the basis of:

a) Knowledge of relevant processes;

b) Skills and operations involved;

c) Results / products including calculation and reporting.

7.2 In case a course is fully of P type (L=0: T=0: P=4), the performance of a candidate shall be assessed for a **maximum of 100 marks** as explained below:

a. Continuous assessment (IA) = 50 marks
b. Semester end examination (SEE) practical = 50 marks

7.3. The **50 marks meant for continuous assessment** (IA) shall further be allocated as under:

i	Conduction of regular practical/ drawing throughout the semester	25 marks
ii	Maintenance of drawings / records	10 marks
iii	Performance of mid-term review / test	15 marks
	Total	**50 marks**

7.4. **The 50 marks meant for Semester End Examination (SEE)**, practical shall be allocated as under:

i	Evaluation of the work - Concepts	10 marks
ii	Drawings, Models Presentation	30 marks
iii	Verbal Presentation	10 marks
	Total	**50 marks**

The Semester end review examination for Practical / drawing / Studio courses work will be conducted jointly by internal examiner and external jury.

7.5 In case a course is partly P type i.e., (L=3): (T=0) (P=1), then the examination for SEE components (theory + practical) will be as decided by the BOS concerned.

7.6. The duration for semester-end practical examination shall also be decided by the concerned School Board.

8. Evaluation of Minor Project / Major Project / Dissertation:

Right from the initial stage of defining the problem, the candidate has to submit the progress reports periodically and also present his/her progress in the form of seminars in addition to the regular discussion with the supervisor. At the end of the semester, the candidate has to submit final report of the project / dissertation, as the case may be, for final evaluation. The components of evaluation are as follows:

Component – I	Periodic Progress and Progress Reports (25%)
Component – II	Results of Work and Draft Report (25%)
Component– III	Final Evaluation and Viva-Voce (50%). Evaluation of the report is for 30% and the Viva-Voce examination is for 20%.

9. The details of continuous assessment are summarized in the following table:

Summary of Continuous Assessment and Evaluation Schedule

Type of Assessment	Period	Syllabus	Marks	Activity
Allocation of Topics for Assignments / Seminars	Beginning of 5th Week	First Unit and Second Unit		Instructional process and Continuous Assessment
First Internal Test	Second Part of 6th Week	First Unit and 1st half of Second Unit	15	Consolidation of First Unit and 1st half of Second Unit

Submission of Assignments	8th Week	First Unit and Second Unit	5	Instructional process and Continuous Assessment
Seminars	9th Week	First Unit and Second Unit	5	Instructional process and Continuous Assessment
Second Internal Test	2nd Part of 13th Week	2nd half of Second Unit and Third Unit	15	Consolidation of 2nd half of Second Unit and Third Unit
Allocation of Topic for 2nd Assignment / Seminars	11th Week	Third Unit and Fourth Unit		Instructional process and Continuous Assessment
Submission of Assignments	13th Week	Third Unit and Fourth Unit	5	Instructional process and Continuous Assessment
Seminars	14th Week	Third Unit and Fourth Unit	5	Instructional process and Continuous Assessment
Third Internal Test	2nd Part of 16th Week	Fourth Unit	15	Consolidation of entire Fourth Unit
Semester End Practical Examination	17th& 18th Week	Entire syllabus	50	Conduct of Semester - end Practical Exams
Preparation for Semester–End Exam	17th& 18th Week	Entire Syllabus		Revision and preparation for semester–end exam
Semester End Theory Examination	19th and 20th Week	Entire Syllabus	50	Evaluation and Tabulation
	End of 21st Week			Notification of Final Grades

Note: 1. *With respect tostudio-based courses involving model making, designs and drawing etc, the School will decide about the Marks and the Number of Model Designs, drawings and the schedule of allocation and presentation of model design(s) / drawings. Based on the number model designs/ drawings the marks are allocated. For Example: In case there are two model designs, eachmodel design carries5 marks; andin case of one model design / drawing, it shall carry 10 marks. However, the decision of the School shall be announced in the beginning of the Semester for students to avoid ambiguity and confusion.*

2. Examination and Evaluation shall take place concurrently and Final Grades shall beannounced latest by 5 day after completion of the examination.

3. Viva/Term work wherever applicable shall be conducted after 3rd test and before semester end examination. The calendar of practical examination shall be decided by the respective School Boards and communicated well in advance to the Registrar (Evaluation) who will notify the same immediately.

10. Provision for Appeal

If a candidate is not satisfied with the evaluation IA components (Internal tests, assignments, seminars) he/she can approach the Grievance Cell with the written submission together with all facts, the assignments, seminar papers, test papers etc, which were evaluated. He/she can do so before the commencement of semester-end examination. The Grievance Cell is empowered to revise the marks if the case is genuine and is also empowered to levy penalty as prescribed by the university on the candidate if his/her submission is found to be baseless and unduly motivated. This Cell may recommend taking disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the grievance cell is final.

For every program there will be one Grievance Cell. The composition of the grievance cell is as follows:-

- The Registrar (Evaluation) - Ex-officio Chairman / Convener
- One Senior Faculty Member (other than those concerned with the evaluation of the course concerned) drawn from the school / department/discipline and/or from the sister schools / departments/sister disciplines – Member.
- One Senior Faculty Members / Subject Experts drawn from outside the University school / department – Member.

11. Eligibility to Appear SEE (Semester-end) Examination

Only those students who fulfill a minimum of 75% attendance in aggregate of all the courses including practical courses / field visits etc, as part of the course and 50% of internal marks in each course shall be eligible to appear for SEE examination.

12. Requirements to Pass the Semester and to Carry Forward the Failed Subjects / Courses:

12.1 Requirements to Pass a Course

A candidate's performance from all IA and SEE components will be in terms of scores, and the sum of IA and SEE scores will be for a maximum of 100 marks (IA=50 + SEE=50) and have to secure a minimum of 45% to declare pass in the course. However, a candidate has to secure a minimum of 30% (15 marks) in SEE which is compulsory.

12.2 Provision to Carry Forward the Failed Subjects / Courses:

The total number of "F" Grades that can be carried forward by a student at the end of any even semester **shall not be more than four courses**.

12.3 Re-Registration and Re-Admission:

a) In case a candidate's class attendance in aggregate of all courses in a semester is less than

75% or as stipulated by the University, such a candidate is considered as dropped the semester and is not allowed to appear for end semester examination (SEE) and he / she shall have to seek re-admission to that semester during subsequent semester / year within a stipulated period.

b) In such case where in a candidate drops all the courses in a semester due to personal reasons, it is considered that the candidate has dropped the semester and he / she shall seek re-admission to such dropped semester.

13. Attendance Requirement:

13.1. All students must attend every lecture, tutorial and practical classes.

13.2 In case a student is on approved leave of absence (e g:- representing the university in sports, games or athletics, placement activities, NCC, NSS activities and such others) and / or any other such contingencies like medical emergencies, the attendance requirement shall be minimum of 75% of the classes taught.

13.3. Any student with less than 75% of attendance in aggregate of all the courses including practical courses / field visits etc, during a semester shall not be permitted to appear to the send semester (SEE) examination and such student shall seek re-admission as provided in 7.4.

13.4. Teachers offering the courses will place the above details in the School Board meeting during the last week of the semester, before the commencement of SEE, and subsequently a notification pertaining to the above will be brought out by the Director of the School before the commencement of SEE examination. A copy of this notification shall also be sent to the office of the Registrar & Registrar (Evaluation).

14. Absence during Internal Test:

In case a student has been absent from Internal Test due to the illness or other contingencies he / she may give a request along with necessary supporting documents and certification from the concerned class teacher / authorized personnel to the concerned Head of the School, for conducting a separate Internal Test. The Head of the School may consider such request depending on the merit of the case and after consultation with course instructor and class teacher, and arrange to conduct a separate test to such candidate(s) well in advance before the SEE examinations of that respective semester. Under no circumstances Internal Tests shall be held / assignments are accepted after Semester End (SEE)examination.

15. Grade Card and Grade Point

15.1. Provisional Grade Card: The tentative / provisional grade card will be issued by the Registrar (Evaluation) at the end of every semester indicating the courses completed successfully. The provisional grade card provides **Semester Grade Point Average** (SGPA).

15.2. Final Grade Card: Upon successful completion of B Arch Degree, a Final Grade card consisting of Grades of all courses successfully completed by the candidate will be issued by the Registrar (Evaluation).

15.3. The Grade and the Grade Point: The Grade and the Grade Point earned by the candidate in the subject will be as given below.

Marks P	Grade G	Grade Point(GP=V x G)	Letter Grade
90-100	10	v*10	O
80-89	9	v*9	A+
70-79	8	v*8	A
60-69	7	v*7	B+
55-59	6	v*6	B
50-54	5.5	V*5.5	C+
45-49	5	v*5	C
0-44	0	v*0	F
ABSENT			AB

O – Outstanding, A+ - Excellent, A- Very good, B+ - Good, B – Above average, C+- Average, C – Satisfactory (Pass), F- Not Satisfactory (Fail)

Here, P is the percentage of marks (P = [(IA + SEE) secured by a candidate in a course which is **rounded to nearest integer**. V is the Credit Value of course. G is the Grade and GP is the Grade Point.

15.4. Semester Grade Point Average (SGPA)

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student in a given semester

15.4.1. Computation of SGPA

The Following is the procedure to compute the Semester Grade Point Average (SGPA):

SGPA (Si) = ∑(Ci x Gi) / ∑Ci

where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

Illustration for Computation of SGPA and CGPA
Illustration No. 1

Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade)
Course 1	**4**	**A+**	**9**	**4X9=36**
Course 2	**4**	**A**	**8**	**4X8=32**
Course 3	**3**	**B+**	**7**	**3X7=21**
Course 4	**3**	**O**	**10**	**3X10=30**
Course 5	**3**	**P**	**5**	**3X5=15**
Course 6	**3**	**B**	**6**	**3X6=18**
Course 7	**2**	**O**	**10**	**2X10=20**
Course 8	**2**	**A**	**8**	**2X8=16**
	24			**188**

Thus, **SGPA = 188 ÷ 24 = 7.83**

Illustration No. 2

Course	Credit	Grade letter	Grade Point	Credit Point (Credit x Grade point)
Course 1	**4**	**A**	**8**	**4X8=32**
Course 2	**4**	**B+**	**7**	**4X7=28**
Course 3	**3**	**A+**	**9**	**3X9=27**
Course 4	**3**	**B+**	**7**	**3X7=21**
Course 5	**3**	**B**	**6**	**3X6=18**
Course 6	**3**	**C**	**5**	**3X5=15**
Course 7	**2**	**B+**	**7**	**2X7=21**
Course 8	**2**	**O**	**10**	**2X10=20**
	24			**175**

Thus, **SGPA = 175 ÷ 24 = 7.29**

Illustration No.3

Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade point)
Course 1	4	O	10	4 x 10 = 40
Course 2	4	A+	9	4 x 9 = 36
Course 3	3	B+	7	3 x 7 = 21
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	B+	7	3 x 7 = 21
Course 7	2	A+	9	2 x 9 = 18
Course 8	2	A+	9	2 x 9 = 18
	24			199

Thus**, SGPA = 199 ÷ 24 = 8.29**

15.5. Cumulative Grade Point Average (CGPA):

15.5.1. Overall Cumulative Grade Point Average (CGPA) of a candidate after successful completion of the required number of credits (240) for B. Arch degree in Architecture is calculated taking into account all the courses undergone by a student over all the semesters of a program, i. e :

CGPA = ∑(Ci x Si) / ∑Ci

Where *Si* is the SGPA of the ith semester and *Ci* is the total number of credits in that semester.

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration:

CGPA after Final Semester

Semester (ith)	No. of Credits (Ci)	SGPA (Si)	Credits x SGPA (Ci X Si)
1	26	6.83	26 x 6.83 = 177.58
2	28	7.29	28x 7.29 = 204.12
3	26	8.11	26 x 8.11 = 210.86
4	26	7.40	26 x 7.40 = 192.4
5	26	8.29	26x 8.29 = 215.24
6	26	8.58	26x 8.58 = 223.08
7	26	9.12	26 x 9.12 = 237.12
8	26	9.25	26 x 9.25 =240.5
9	26	9.35	26x9.35 = 243.1
10	26	9.50	26x9.50 = 247.0
Cumulative	262		2191

Thus, **CGPA** = $\frac{26x6.83+28x7.29+26x8.11+26x7.40+26x8.29+26x8.58+26x9.12+26x9.25+26x9.35+26x9.50}{262} = 8.36$

CONVERSION OF GRADES INTO PERCENTAGE:

Conversion formula for the conversion of CGPA into Percentage is:

Percentage of marks scored = CGPA Earned x 10

Illustration: CGPA Earned 8.36 x 10 = 83.6

15.6. Classification of Results

The final grade point (FGP) to be awarded to the student is based on CGPA secured by the candidate and is given as follows.

CGPA	Grade (Numerical Index)	Letter Grade	Performance	FGP
	G			Qualitative Index
9 >= CGPA 10	10	O	Outstanding	Distinction
8 >= CGPA < 9	9	A+	Excellent	
7 >= CGPA < 8	8	A	Very Good	First Class

6 >= CGPA < 7	7	B+	Good	
5.5> = CGPA < 6	6	B	Above average	Second Class
> 5 CGPA < 5.5	5.5	C+	Average	
> 4.5 CGPA <5	5	C	Pass	Satisfactory

Overall Percentage=10*CGPA

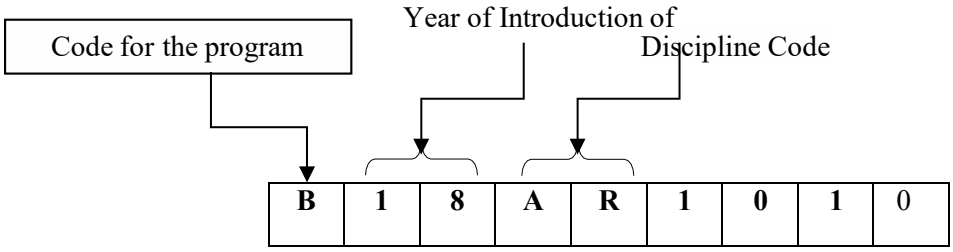
16. Challenge Valuation:

a. A student who desires to apply for challenge valuation shall obtain a photo copy of the answer script by paying the prescribed fee within 10 days after the announcement of the results. He / She can challenge the grade awarded to him/her by surrendering the grade card and by submitting an application along with the prescribed fee to the Registrar (Evaluation) within 10 days after the announcement of the results. This challenge valuation is only for SEE component.

b. The answer scripts for which challenge valuation is sought for shall be evaluated by the external examiner who has not involved in the first evaluation. The higher of two marks from first valuation and challenge valuation shall be the final.

17. With regard to any specific case of ambiguity and unsolved problem, the decision of the Vice-Chancellor shall be final.

COURSE NUMBERING SCHEME



List of Codes for Programs and Disciplines / Branch of Study

Program Code	Title of the Program	Discipline Code	Name of the Discipline / Branch of Study
BA	Bachelor of Arts	AE	Advanced Embedded Systems
BB	BBM (Bachelor of Business Management)	AI	Advanced Information Technology
BC	B.Com (Bachelor of Commerce)	AP	Advanced Power Electronics
BR	B. Arch (Bachelor of Architecture)	CA	Computer Aided Structural Engineering
BS	B Sc, BS (Bachelor of Science)	CE	Civil Engineering
BT	B.Tech (Bachelor of Technology)	CH	Chemistry
BP	Bachelor of Computer Applications	CO	Commerce
BL	LLB (Bachelor of Law)	CS	Computer Science and Engineering / Computer Science
MA	Master of Arts	DE	Data Engineering and Cloud Computing
MB	MBA (Master of Business Administration)	EC	Electronics and Communication Engineering
MC	M.Com (Master of Commerce)	EN	English
MS	M.Sc / MS (Master of Science)	MD	Machine Design and Dynamics
MT	M Tech (Master of Technology)	ME	Mechanical Engineering
MC	Master of Computer Applications	EE	Electrical & Electronics Engineering

BACHELOR OF ARCHITECTURE (B Arch) DEGREE PROGRAM

PROGRAM EDUCATION OBJECTIVES

The architectural graduates from REVA University after 5 years of completion of the program will:

1: Serve as a professional Architect with moral and ethical values.

2: Engage in Lifelong learning through RESEARCH

3: Serve as a leader through consultancy, extension activities and entrepreneurship.

PROGRAMME OUTCOMES

On successful completion of the Programme the student shall be able to:

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a. Apply perceptive, aesthetic and creative abilities to design innovative solutions in the global context.
b. Identify and formulate a design problem by applying analytical reasoning and critical thinking.
c. Apply multi-disciplinary knowledge of history, culture, technical and legal aspects to address environmental and social needs.
d. Demonstrate the ability to deliver a project using contemporary techniques and tools.
e. Demonstrate effective visual, written and verbal communication skills.
f. Perform all professional responsibilities independently and as a team member with leadership skills and ethical values.
g. Develop an aptitude towards research and critical evaluation.

Programme Specific outcomes (PSOs):

On successful completion of the program the student will be able to:

PSO1- Assimilate the knowledge of Socio cultural, technical, environmental and legal aspects relevant to the design of human habitat.

PSO2-Analyse and design sustainable solutions for the built and unbuilt environment.

PSO3- Demonstrate the ability to use contemporary tools and techniques to solve real life problems

Course	Code	Course Objectives	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO1	PSO2	PSO3
BASIC DESIGN AND VISUAL ARTS	B18AR1010	CO1	3	0	3	1	1	2	0	1	2	2	2
		CO2	0	0	0	0	2	2	1	0	1	0	3
		CO3	0	1	3	2	1	2	0	0	1	2	3
		CO4	0	1	2	1	1	2	1	0	1	1	0
SSBC I	B18AR1020	CO1	1	2	2	4	2	2	0	4	2	2	1
		CO2	0	2	2	3	2	3	0	3	4	3	2
		CO3	0	0	0	0	0	0	0	0	0	0	0
		CO4	0	0	0	0	0	0	0	0	0	0	0
Architectural Representation-1	B18AR1030	CO1	0	2	2	2	1	2	1	1	1	1	2
		CO2	0	2	2	2	1	2	0	1	1	1	2
		CO3	0	2	1	2	1	2	0	1	1	1	2
		CO4	0	3	1	2	1	2	0	1	1	1	2
History of Architecture I	B18AR1040	CO1	2	0	2	0	1	0	1	0	2	0	0
		CO2	2	0	3	1	2	0	2	0	3	1	0
		CO3	2	2	3	1	2	0	2	0	2	1	1
		CO4	1	1	2	0	2	0	1	0	1	1	0
Environmental studies	B18AR1050	CO1	2	0	2	0	0	2	0	2	3	0	3
		CO2	2	3	0	0	0	0	0	1	3	0	2
		CO3	1	0	2	1	0	2	0	1	3	3	2
		CO4	3	1	2	0	0	0	1	1	0	1	1
Technical English-i	B18AR1060	CO1	0	0	0	3	3	3	0	3	0	0	3
		CO2	1	3	3	3	3	0	0	3	0	0	3
		CO3	0	3	0	3	3	0	0	3	0	0	3
		CO4	3	0	0	0	0	3	0	3	3	0	0
Architectural Design I	B18AR2010	CO1	0	2	2	1	1	0	1	1	1	2	1
		CO2	0	3	2	1	1	0	1	1	1	2	1
		CO3	1	2	2	0	0	0	0	1	2	2	1
		CO4	3	2	2	0	1	0	2	0	3	2	1
SSBC-II	B18AR2020	CO1	2	3	2	2	1	2	1	1	2	3	1
		CO2	3	2	3	1	1	2	0	1	2	2	2
		CO3	1	0	3	1	1	1	0	1	1	2	2
		CO4	2	3	2	1	1	2	1	1	2	2	2
Architectural Representation-II	B18AR2030	CO1	0	2	1	2	1	2	0	1	1	1	2
		CO2	0	2	1	2	1	2	0	1	1	1	2
		CO3	1	2	1	2	1	2	0	1	1	1	2
		CO4	0	2	1	2	1	2	0	1	1	1	2
History of Architecture I	B18AR2040	CO1	2	0	2	0	1	0	1	0	2	0	0
		CO2	2	0	3	1	2	0	2	0	3	1	0
		CO3	2	2	3	1	2	0	2	0	2	1	1
		CO4	1	1	2	0	2	0	1	0	1	1	0
Architectural Model making	B18AR2050	CO1	2	3	1	2	1	2	0	1	2	2	2
		CO2	3	3	1	2	1	2	0	1	3	3	2
		CO3	1	3	1	2	1	2	0	1	1	2	2
		CO4	2	3	2	2	1	2	0	1	1	3	2
Constitution of India	B18AR2070	CO1	2	0	3	0	1	0	1	1	3	0	3
		CO2	3	0	3	0	0	0	0	3	0	0	3

		CO3	0	0	3	0	0	3	0	0	3	0	3
		CO4	3	0	3	0	0	0	0	3	0	0	3
Technical English -II	B18AR2060	CO1	0	0	0	3	3	0	0	3	0	0	3
		CO2	0	1	3	3	3	0	0	0	0	0	3
		CO3	0	0	0	3	3	0	0	0	0	0	3
		CO4	0	3	0	0	0	3	0	0	0	0	3
HOA 3		**CO1**	2	1	1	0	0	1	1	1	2	1	1
	B18AR3050	**CO2**	3	1	1	0	0	1	1	1	2	1	1
		CO3	3	1	1	1	0	1	1	1	3	0	1
		CO4	0	0	0	2	2	2	1	1	2	1	2
Architectural Design – II	B18AR3010	**CO1**	0	0	2	1	0	2	2	1	2	2	3
		CO2	2	2	1	1	1	2	1	0	2	3	2
		CO3	2	2	2	1	1	2	1	0	1	3	2
		CO4	1	3	1	2	1	1	2	1	2	2	3
Site survey & Planning	B18AR3060	**CO1**	2	3	3	1	2	2	1	1	1	3	2
		CO2	1	0	2	2	0	1	0	2	2	1	2
		CO3	0	1	3	2	0	1	1	2	2	2	3
		CO4	0	0	2	1	0	1	2	2	1	3	2
SSBC-III	B18AR3020	**CO1**	3	2	2	1	1	2	0	1	2	2	2
		CO2	2	3	2	1	1	2	1	1	2	2	2
		CO3	3	2	3	1	1	2	0	1	2	2	2
		CO4	3	2	3	1	1	2	1	1	2	2	2
Computer applications in Architectural Design	B18AR3070	**CO1**	1	2	0	2	1	1	0	2	2	1	3
		CO2	1	1	0	2	1	1	0	1	2	0	2
		CO3	1	2	0	2	1	1	0	1	2	1	3
		CO4	1	2	0	2	1	1	0	1	2	1	3
RULO	MPA17F3910/ 20/30	**CO1**	1	1	2	1	0	0	1	2	0	1	2
		CO2	1	2	2	0	1	0	0	1	1	1	3
		CO3	2	2	1	0	0	0	1	0	1	0	1
		CO4	1	1	1	3	3	1	1	1	2	2	1
Building Services-I	B18AR3040	**CO1**	3	2	2	2	2	2	1	2	3	3	3
		CO2	3	2	2	2	2	2	1	2	3	3	3
		CO3	3	1	1	1	2	2	1	2	3	3	3
		CO4	3	3	2	2	2	2	1	2	3	3	3
HOA 4	B18AR4060	CO1	2	1	1	0	0	1	1	1	2	1	1
		CO2	3	1	1	0	0	1	1	1	2	1	1
		CO3	3	1	1	1	0	1	1	1	3	0	1
		CO4	0	0	0	2	2	2	1	1	2	1	2
Climatology	B18AR4030	CO1	2	1	3	0	0	0	2	2	3	2	0
		CO2	2	1	3	2	2	2	2	2	3	3	3
		CO3	5	3	3	2	2	2	2	2	3	3	3
		CO4	5	3	3	2	2	2	2	2	3	3	0
Housing	B18AR4050	CO1	3	1	3	1	1	1	2	1	3	2	2
		CO2	2	0	3	2	1	1	2	1	3	2	2
		CO3	5	0	2	2	1	1	2	1	3	2	2
		CO4	2	2	2	2	1	1	2	1	3	2	3
Architectural Design – III	B18AR4010	CO1	3	0	3	2	1	1	2	1	3	2	3
		CO2	3	1	1	2	1	1	2	1	3	3	2
		CO3	1	2	1	1	1	1	1	1	2	2	2
		CO4	1	2	2	2	1	1	1	1	2	2	3
SSBC-IV	B18AR4020	CO1	3	2	3	1	1	2	1	1	2	3	2

		CO2	3	3	3	1	1	2	0	1	2	3	2
		CO3	2	1	2	1	1	2	0	1	2	2	2
		CO4	2	3	2	1	1	2	1	1	2	2	2
Computer applications in Architectural Design-II	B18AR4070	CO1	1	2	0	2	1	1	0	1	2	1	3
		CO2	1	2	0	2	1	1	0	1	2	0	3
		CO3	1	2	0	2	1	1	0	1	2	1	3
		CO4	1	2	0	2	1	1	0	1	2	1	3
BUILDING SERVICES -II	B18AR4040	CO1	3	3	3	2	1	2	1	2	3	3	3
		CO2	3	3	3	2	1	2	2	2	2	3	3
		CO3	3	2	3	2	1	1	1	2	3	3	3
		CO4	3	2	3	2	1	2	2	2	2	3	3
S.S.B.C V	B18AR5020	**CO1**	3	1	1	1	0	0	0	0	3	3	2
		CO2	1	1	1	2	0	1	2	0	1	1	2
		CO3	3	0	2	0	0	2	2	2	3	1	3
		CO4	2	3	3	3	0	1	3	0	2	3	3
		CO5	0	3	1	3	0	2	2	1	3	2	1
Contemporary period	B18AR5060	**CO1**	3	1	1	0	2	2	2	1	2	0	0
		CO2	3	3	2	0	0	2	0	1	3	2	0
		CO3	3	1	2	1	0	0	1	1	3	0	1
		CO4	2	3	2	1	1	2	1	0	3	1	1
Energy Efficiency in Buildings	B18AR5030	**CO1**	3	1	3	0	2	0	2	2	3	0	0
		CO2	3	3	3	2	2	2	2	2	3	3	3
		CO3	2	2	3	2	2	2	2	2	3	3	3
		CO4	2	3	3	2	2	2	2	2	3	3	3
ARCHITECTURAL DESIGN-IV	**B18AR5010**	**CO1**	3	1	3	1	1	1	1	1	3	1	2
		CO2	2	3	3	2	1	2	2	1	3	3	2
		CO3	3	3	2	2	1	2	2	1	3	3	3
		CO4	3	3	2	2	2	2	0	1	3	2	3
Theory of Architecture	B18AR5050	**CO1**	3	2	1	2	2	0	2	0	3	2	2
		CO2	1	3	2	1	1	0	2	0	1	3	3
		CO3	1	3	3	2	3	0	2	0	1	3	3
		CO4	1	1	2	3	3	0	3	0	1	2	3
BS III	B18AR5040	**CO1**	2	0	0	1	0	0	0	0	1	0	2
		CO2	1	1	3	0	2	2	0	0	0	0	1
		CO3	1	3	0	1	2	2	2	0	1	2	0
		CO4	0	1	3	0	2	2	0	0	1	2	1
S.S.B.C VI	B18AR6020	**CO1**	3	1	3	1	2	2	1	1	3	2	2
		CO2	3	1	3	2	2	2	2	1	3	3	3
		CO3	3	2	3	2	2	2	1	1	3	3	3
		CO4	3	2	1	1	2	2	1	1	3	2	2
Digital Architecture	B18AR6052	**CO1**	3	3	2	2	0	2	2	1	3	3	3
		CO2	1	3	3	1	0	2	0	1	3	0	2
		CO3	2	3	2	2	1	2	1	1	3	0	2
		CO4	1	3	3	2	0	2	0	1	3	1	2
Certfication course - advanced architectural tools	B18AR6070	**CO1**	1	1	0	2	1	1	0	1	2	1	2
		CO2	1	3	1	2	1	1	0	1	2	3	2
		CO3	3	3	3	2	1	1	1	2	3	3	3
		CO4	3	2	3	2	1	2	2	2	2	3	2
Working Drawing	B18AR6030	**CO1**	3	2	2	2	2	2	2	3	3	2	2
		CO2	2	2	2	2	2	2	2	2	2	2	3
		CO3	2	3	3	3	3	1	3	3	3	3	2
		CO4	2	3	3	2	3	2	2	2	3	3	2
ARCHITECTURAL DESIGN-V	B18AR6010	**CO1**	3	1	3	2	1	1	1	1	1	1	1
		CO2	3	3	3	2	1	2	2	1	3	3	3
		CO3	3	3	2	2	1	2	2	1	3	3	3

		CO4	2	3	2	2	2	2	0	1	2	1	3
Urban Planning	B18AR6060	**CO1**	5	3	3	2	2	2	2	2	3	3	3
		CO2	2	2	3	2	2	2	2	2	3	3	3
		CO3	5	2	3	2	2	2	2	2	3	3	3
		CO4	5	3	3	2	2	2	2	2	3	3	3
ARW	B18AR6051	**CO1**	1	0	3	3	0	0	3	0	3	3	3
		CO2	1	3	3	3	0	0	3	3	1	3	3
		CO3	2	1	3	3	3	3	3	0	1	3	3
		CO4	0	0	3	3	3	3	3	3	0	2	3
ARCHITECTURAL DESIGN-V	**B18AR6010**	**CO1**	3	1	3	2	1	1	1	1	1	1	1
		CO2	3	3	3	2	1	2	2	1	3	3	3
		CO3	3	3	2	2	1	2	2	1	3	3	3
		CO4	2	3	2	2	2	2	0	1	2	1	3
Building Services-IV	B18AR6040	CO1	1	0	3	1	2	2	2	1	2	1	2
		CO2	1	2	3	1	1	2	2	0	2	1	3
		CO3	1	2	3	2	1	2	2	1	2	2	3
		CO4	1	1	3	1	2	2	2	2	2	3	2
Architectural Design 7	B18AR701	**CO1**	2	1	2	0	1	1	1	1	2	2	2
		CO2	2	2	3	3	1	2	3	2	2	1	2
		CO3	3	2	1	1	0	1	1	1	3	1	1
		CO4	1	2	3	2	1	2	2	2	3	3	2
Vacation Assignment/Study Trip/Summer course	B18AR707	**CO1**	3	1	1	0	1	2	1	2	3	1	2
		CO2	0	3	2	1	1	3	2	2	2	1	1
		CO3	3	2	2	1	1	1	2	2	3	1	3
		CO4	3	2	2	1	1	2	1	1	1	2	2
Professional Practice, Values & Ethics	B18AR702	**CO1**	2	0	3	1	2	2	0	1	2	0	3
		CO2	3	0	3	1	0	2	0	3	3	0	1
		CO3	3	0	3	2	2	2	0	1	2	1	3
		CO4	3	1	3	1	3	2	0	8	1	0	2
Interior Design	B18AR704	**CO1**	2	2	2	2	2	3	2	2	2	2	2
		CO2	0	2	2	2	1	2	1	1	1	2	1
		CO3	2	2	3	2	2	2	3	3	2	3	2
		CO4	2	3	3	3	3	3	2	2	3	3	3
Urban Design	B18AR7052	**CO1**	3	0	2	2	2	2	2	2	3	1	2
		CO2	3	3	2	3	3	3	1	2	3	3	2
		CO3	3	3	3	3	3	3	3	2	3	3	3
		CO4	3	3	2	3	3	3	3	3	3	3	3
Urban Planning	B18AR7051	**CO1**	3	3	3	2	2	2	2	2	3	3	3
		CO2	2	2	3	2	2	2	2	2	3	3	3
		CO3	3	2	3	2	2	2	2	2	3	3	3
		CO4	3	3	3	2	2	2	2	2	3	3	3
OPEN ELECTIVE	B18AR7061	**CO1**	2	2	1	3	2	2	3	3	3	0	3
		CO2	3	3	2	3	1	3	3	3	3	3	1
		CO3	2	2	3	2	1	2	1	3	2	1	2
		CO4	2	1	0	2	2	3	0	3	3	0	3
Practical Training	B18AR8010	**CO1**	3	3	2	3	1	0	0	0	3	1	3
		CO2	0	3	3	3	1	0	3	1	0	3	3
		CO3	0	3	3	3	3	0	0	0	0	0	3
		CO4	1	0	2	2	3	3	3	2	2	3	3
Architectural Design Thesis	B18ARX010	**CO1**	2	2	3	2	1	2	2	2	3	2	2
		CO2	2	2	3	2	1	2	1	2	3	2	2
		CO3	2	3	1	1	2	1	1	1	2	2	1
		CO4	0	2	1	3	2	4	2	1	2	2	2

Architectural journalism	B18ARX021	CO1	0	0	3	2	0	2	0	2	1	0	3
		CO2	3	2	0	2	2	2	1	1	2	0	2
		CO3	0	0	3	2	2	2	1	1	2	2	2
		CO4	1	0	3	2	2	2	1	1	2	1	2
Disaster Mitigation and Management	B18ARX022	CO1	2	2	1	3	2	2	3	3	3	0	3
		CO2	3	3	2	3	1	3	3	3	3	3	1
		CO3	2	2	3	2	1	2	1	3	2	1	2
		CO4	2	1	0	2	2	3	0	3	3	0	3
Construction Management	B18ARX030	CO1	2	2	1	3	2	2	3	3	3	0	3
		CO2	3	3	2	3	1	3	3	3	3	3	1
		CO3	2	2	3	2	1	2	1	3	2	1	2
		CO4	2	1	0	2	2	3	0	3	3	0	3
B18ARX040	MOOC / SWAYAM	CO1	0	0	3	2	0	2	0	2	1	0	3
		CO2	3	2	0	2	2	2	1	1	2	0	2
		CO3	0	0	3	2	2	2	1	1	2	2	2
		CO4	1	0	3	2	2	2	1	1	2	1	2

PEO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
PEO 1	√	√	√	√	√	√	√	√	√	√
PEO 2	√	√	√	√	√	√	√	√	√	√
PEO 3	√	√	√	√	√	√	√	√	√	√

B ARCH DEGREE PROGRAM

SCHEME OF INSTRUCTION FOR 2018 BATCH
(2018 to 2023) STUDENTS

FIRST SEMESTER

FIRST SEMESTER							
No	**Course Code**	**Course Title**	**Type**	**L : P : D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR1010	Basic Design and Visual Art	PC	2:2:4	9	8	VV
2	B18AR1020	Structural Systems and Building Construction-I	BS	3:3:1	6	7	VV
3	B18AR1030	Architectural Representation-I	PC	1:3:1	4	5	TW
4	B18AR1040	History of Architecture - I	PC	3:0:0	3	3	SEE
5	B18AR1050	Environmental Studies	BS	2:0:0	2	2	SEE
6	B18AR1060	Technical English I	SE	0:4:0	2	4	SEE
Total Credits					**26**	**29**	
SECOND SEMESTER							
No	**Course Code**	**Course Title**	**Type**	**L : P : D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR2010	Architectural Design – I	PC	2:2:4	9	8	VV
2	B18AR2020	Structural Systems and Building Construction-II	BS	3:3:1	6	7	VV
3	B18AR2030	Architectural Representation-II	PC	1:3:1	4	5	TW
4	B18AR2040	History of Architecture – II	PC	3:0:0	3	3	SEE
5	B18AR2050	Model Making/art appreciation	PE	1:2:0	2	3	INT
6	B18AR2060	Technical English II	SE	0:4:0	2	4	SEE
7	B18AR2070	Constitution of India	PC	2:0:0	2	2	SEE
Total Credits					**28**	**32**	

THIRD SEMESTER							
No	**Course Code**	**Course Title**	**Type**	**L : P : D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR3010	Architectural Design - II	PC	2:2:4	9	8	VV
2	B18AR3020	Structural Systems and Building Construction-III	BS	4:3:1	7	7	VV
3	MPA17F3910/ 20/30	Music/Dance/ /Yoga	PE	2:0:0	2	2	SEE
4	B18AR3040	Building Services-I	BS	2:0:0	2	2	SEE
5	B18AR3050	History of Architecture- III -Hindu and Buddhist Architecture	PC	2:2:0	3	4	VV
6	B18AR3060	Site Survey and Planning	BS	2:1:0	2	3	SEE
7	B18AR3070	Computer Applications in Architectural design -I	SE	3:0:0	3	3	TW
Total Credits					**28**	**29**	
FOURTH SEMESTER							
No	**Course Code**	**Course Title**	**Type**	**L : P : D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR4010	Architectural Design - III	PC	2:2:4	9	8	VV
2	B18AR4020	Structural Systems and Building Construction-IV	BS	4:3:1	7	7	VV
3	B18AR4030	Climatology	BS	3:0:0	3	3	SEE
4	B18AR4040	Building Services -II	BS	2:0:0	2	2	SEE
5	B18AR4050	Housing	PC	3:0:0	3	3	SEE
6	B18AR4060	History of Architecture – IV Islamic Architecture	PC	2:2:0	3	4	VV
7	B18AR4070	Computer applications in Architectural design -II	SE	2:1:0	2	3	TW
Total Credits					**29**	**30**	

FIFTH SEMESTER							
No	**Course Code**	**Course Title**	**Type**	**L : P : D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR5010	Architectural Design - IV	PC	3:1:4	10	8	VV
2	B18AR5020	Structural systems and building construction-V	BS	4:2:2	8	8	VV
3	B18AR5030	Energy efficient Design	BS	1:2:0	2	3	TW
4	B18AR5040	Building services III	BS	2:0:0	2	2	SEE
5	B18AR5050	Theory of Architecture	PC	3:0:0	3	3	SEE
6	B18AR5060	History of Architecture V-Contemporary Period	PC	3:0:0	3	3	VV
		Total Credits			28	27	
SIXTH SEMESTER							
No	**Course Code**	**Course Title**	**Type**	**L : P : D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR6010	Architectural Design - V	PC	3:1:4	10	8	VV
2	B18AR6020	Structural Systems and Building Construction-VI	BS	3:1:1	5	5	VV
3	B18AR6030	Working Drawings	PC	2:1:0	3	3	TW
4	B18AR6040	Building Services-IV	BS	2:1:0	2	3	SEE
5	B18AR6051/52	Research in Architecture/Contemporary Process in Architecture	PE	3:0:0	3	3	VV
6	B18AR6060	Urban Planning	PC	3:0:0	3	3	SEE
Total Credits					**26**	**25**	

VII SEMESTER							
No	**Course Code**	**Course Title**	**Type**	**L : P : D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR7010	Architectural Design - VI	PC	3:0:6	12	9	VV
2	B18AR7020	Estimation & Costing	BS	3:0:0	3	3	SEE
3	B18AR7030	Professional Practice	PA	3:0:0	3	3	SEE
4	B18AR7041	Interior Design	PE	3:0:0	3	3	VV
	B18AR7042	Graphic Design					
	B18AR7043	Product Design					
5	B18AR7051	Vernacular Architecture	PE	3:0:0	3	3	SEE
6	B18AR7052	Barrier free Architecture					
7	B18AR7061	Introduction to Sustainability	OE	3:0:0	3	3	SEE
8	B18AR7062	Municipal Solid Waste Management in Developing Countries					
10	B18AR7070	Self-Direct Learning	PA	2:0:0	2	0	INT
Total Credits					**29**	**24**	

VIII SEMESTER							
No	**Course Code**	**Course Title**	**Type**	**L : P : D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR8010	Architectural Design - VII	PC	2:1:7	13	10	VV
2	B18AR8020	Pre-Thesis	PC	0:4:0	2	4	INT
3	B18AR8030	Landscape design	PC	2:2:0	3	4	SEE
4	B18AR8041	Urban Design	PE	3:0:0	3	3	SEE
	B18AR8042	Conservation studies					
5	B18AR8051	Advanced Building Materials	PE	3:0:0	3	3	SEE
	B18AR8052	Real Estate and Valuation					
6	B18AR8060	Certification Course in Advanced Software	PA	0:4:0	2	32 HOURS CERTIFICATION	INT
7	B18AR8070	Certification Course in Entrepreneurship	PA	2:0:0	2	0 (Online 4 to 6 weeks)	INT
Total Credits					**28**	**22**	

IX SEMESTER						
No	**Course Code**	**Course Title**	**Type**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18AR9010	Practical Training	PA	26	18 weeks	VV
Total Credits				**26**		

No	**Course Code**	**Course Title**	**Type**	**L-P-D**	**Total Credits**	**Contact Hours**	**Evaluation**
1	B18ARX010	Thesis	PC	6:0:8	18	14	VV
2	B18ARX021	Architectural Journalism	PE	3:0:0	3	2	SEE
3	B18ARX022	Disaster Mitigation and Management					
4	B18ARX030	Construction Management	PA	3:0:0	3	3	SEE
5	B18ARX040	SDL	PA	2:0:0	2	0 (online 4 to 6 weeks)	INT
Total Credits					**26**	**19**	
Total Credits from 1 to 10 Semesters					**274**		

i.L=lecture; P=Practice, Lab, Studio Exercise, Seminar; D=Design
ii.1 hour of L = 1 Credit; 1 hour of P-Lab/ Seminar/Practice=1/2 credit, 1 hour of D = 1.5 Credit
iii.SDL – Self Directed Learning

SEE = Semester end Theory Exam, VV=Viva voce, INT= Continuous Internal Evaluation
PC= Professional Core (140-51.5%), BS= Building Services and Allied Engineering (58-21%)
SE=Skill Enhancement Courses (11-4%), PA= Professional ability courses (34-12%)
PE= Professional elective (27-10%), Open Electives (4-1.5%)
Total credits – 274.

Semester wise Credits Distribution

Sl. No.	Semester	Credits	Contact Hours
1	Semester - 1	26	29
2	Semester - 2	28	32
3	Semester - 3	28	29
4	Semester - 4	29	30
5	Semester - 5	28	27
6	Semester - 6	26	25
7	Semester - 7	29	24
8	Semester - 8	28	28
9	Semester - 9	26	16 to 18 weeks
10	Semester - 10	26	19
	Total	274	237

DETAILED SYLLABUS FOR I SEMESTER

1. Basic Design and Visual Art

Course Code	Course Title	Type	Total Credits	Contact Hrs 10hrs		
				L	T	P
B18AR1010	BASIC DESIGN AND VISUAL ARTS	PC	9	4	2	4

COURSE OBJECTIVES:

1. Explain the meaning and purpose of design through visual compositions.
2. Train the students in visual composition, architectural perception and representation through 2D and 3D
3. Translate elements and principles of Basic Design as the building blocks of creative design.
4. To apply abstract principles of design and anthropometric studies into architectural solutions.

COURSE CONTENTS:

Course Content:

UNIT-1

Elements of design: properties, qualities and characteristics of point, line, plane, direction, shape, form, color and texture. Learning the importance of line types, characteristics and qualities of line types.

Introducing Principles of Design: Balance, proportion, scale, Unity, Variety, Emphasis, contrast, Pattern, Gradation, Dynamism, Positive and Negative. Work in small groups with variety in Materials and mediums choosing between 2D and 3D methods of presenting the idea. Theory component for Scale, proportions will go parallel with studio.

Visual Art techniques in representation: Introduction to different mediums like pencil, pen, color pencils, pastels, watercolors and acrylic to be explored in the Basic design exercises of Elements and Principles.

Exercises can be done in groups or individually.

UNIT-2

Introduction to Anthropometry and its importance as a tool in designing architectural spaces. Work with life size models and compare Indian adaptations and scale with Standards. Erecting a structure to

Human scale to understand volume and its relation to anthropometry. Ideating and executing the design in Groups.
Exercises to demonstrate the relationship between Form, Space and enclosures. Introduction to Principles of Spatial organization
Visual art Techniques to be applied to developing conceptual design drawings.
Emphasis on transformation of conceptual drawings to the 2D drawing; Basics of preparation of plans, elevations, sections and views with an exercise in Measure drawing. Single function space in the immediate environment like Hostel room, kitchen and toilet or bedroom at their residence.

UNIT-3
Design of an architectural space having form and volume or additions/extensions to a built space; representing the same through Plan, Section, Elevation and Models. Students should learn to develop more than one solution to the design and learn the process of selection /elimination.
UNIT-4
Thought to be given to materials. Importance to be given to understand basics in the representations: Plinth, levels, Entrance porch, sill, lintels, parapets etc. that is learnt in Building construction.
Visual art techniques mastered to be applied in the presentation and model.
Course Outcomes:
The students should be able to

1. Identify and Analyse the design elements by comparing, reasoning and understanding the design principles through visual compositions using 2D, 3D objects or tools with various techniques and improving observation skills to adapt the interesting things in the day today life objects and learning various examples from History and culture.Express the same through 2D and 3D compositions.
2. Express in the way of reports and presentation of understanding the importance and knowledge of 2D and 3D compostions considering the three important factos such as stability, aesthetics and functions.
3. Analyse and Apply the suitable anthropometry and principles of design for the given problem and provide suitable/practical solutions in the ways of drawings and sketches by solving the issues and problems for the assigned spaces.
4. Represent the finalized solutions after critical evaluation through drawings and models in an architectural space assigned for various typologies with specific dimensions and incorporating presentation skills.

Reference Books:

1. Archi-doodle- by Steve Browkett
2. Universal Principles of Design, William Lidwell, Kristina Holden, Jim Butler
3. Design Elements: A Graphic style Manual, Timothy Samara
4. Visual Grammar by Christian Leborg
5. Visual Thinking for Design, Colin Ware.
6. Design of everyday things, Donald Norman.

2. STRUCTURAL SYSTEMS & BUILDING CONSTRUCTIONS MATERIALS- I

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR1020	STRUCTURAL SYSTEMS & BUILDING CONSTRUCTIONS MATERIALS- I	BS	5	3	2	3

COURSE OBJECTIVES:

1. Enumerate the basic building elements, materials used in Load bearing construction
2. Describe the basic forces of Tension and Compression and the system of distribution of loads with respect to Arches and Lintels

- Discuss Earth as a material, its constituents and understanding its market ready forms, compressive quality and applications.
- Trace evolution of structures through History, the techniques used, the two basic systems Trabeated and Framed, describe a typical wall section with all its different components.

COURSE CONTENTS:

UNIT-I

Introduction to drafting and drafting Equipment: Lines, Hatches, Lettering, Scales and basics of sheets composition. Understanding Line weights through the use of manual drafting.
Introduction to Tension and Compression forces through examples
Introduction to Brick as a building unit :

- Constituents of Brick
- Physical and Chemical properties of Brick
- Brick Masonry (Full , Half Brick Wall in English bond)
- Mud, lime and Cement as mortar

Distribution of Compressive load in Brick Masonry
Introduction to Stone as a building unit :

- Constituents of Stone
- Physical and Chemical properties of Stone
- Stone Masonry (Random Rubble, Dressed Masonry, Methods of Pointing)

UNIT-II

Introduction to the concept of Catenary and Arch (Forces of Tension and Compression) : Distribution of Horizontal and Vertical compression forces in an Arch, and formation of line of Thrust, with live examples
Basic components of an Arch. Major types of Arches.

UNIT-III

Introduction to Earth as a building unit :

- Constituents of Earth
- Physical and Chemical properties of Earth
- Process of Stabilizing Earth
- Compressed Earth Block Masonry

Distribution of Compressive load in Compressed Earth Block Masonry. Live examples showing how CEB Masonry is weak in Tension and good in Compression.

UNIT-IV

Introduction to the following techniques :

- Rammed Earth
- Adobe Construction

Material Study: Sand, Fly ash, cement, lime, aggregate.
Visits to Brick industry, Stone quarry to study the manufacturing process and related activities.
2 to 4 plates from each unit, sketch book and material portfolio and models to be prepared.

COURSE OUTCOMES:

The students by the end of the course will be able to Acquire an exposure to the basic building materials like bricks, stone, earth, andcement, timber, steel and elaborate and compare brick and stone masonry

1. Identify and distinguish the nature of the basic forces of tension and compression and illustrate it through building systems like Arches and Lintels
2. Describe and comprehend earth as a building material, outline its constituents and identify its market forms and applications
3. Classify the two structural systems by understanding its evolution through History and explain the components of a simple Load bearing structure made of Masonry.

REFERENCES:

1. Building Construction Hand book, Roy Chudley and Roger Greeno, Routledge, London
2. Building Construction, Sushil Kumar, Standard Publishers Distributors, New Delhi
3. Building Construction, Punmia, Ashok K Jain, & Arun K Jain, Lakxmi Publications (P) Ltd, New Delhi
4. Building Construction Illustrated, Francis D K Ching, John Wiley & Sons, Inc, New York.

3. Architectural Representation-I

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	P	T
B18AR1030	Architectural Representation-1	PC	5	2	0	3

COURSE OBJECTIVES:

1. To enhance drawing, visualization and representation skills and familiarize with drawing equipment like scales, set squares, pencils & its application and proportioning through free hand sketches
2. Explain orthographic projections in relation to architectural drawings & details
3. Introduce the technique of drawing different types of view of built elements and built form
4. Introduce the basic techniques of shading and material textures using pen and ink

COURSE CONTENT

Unit-1

Introduction to visual representation and dimensioning systems:

The basic principles of drawing and line conventions, BIS Conventions and drawing sheets. Introduction to types of dimensioning systems- linear, continuous and angular dimensions.

Architectural lettering and concept of scale and its application:

Introduction to lettering used in architectural drawings, practicing various font styles. Introduction to concept of scale, types of scale and its application in drawing.

Introduction to Euclidian Geometry:

Exercises in lines and angles, construction of quadrilaterals and regular polygons and tangents.

Unit-2

Construction of Conic Sections:

Construction of plane curves, ellipse, parabola, hyperbola and cycloids.

Orthographic projection (first angle projection)

Principles of orthographic projection: projections of points, lines, and planes – explore all combinations.

Orthographic projection of solids

Cube, Prism, Pyramid, Cylinder and Cone.

Orthographic projection of architectural built elements

Drawing Orthographic projection for simple furniture and interior spaces like living and bedroom or part of a class room.

Unit-3

3D views

Introduction to Isometric view and axonometric views of solids and combination solids.

Exercise in Isometric views

Built elements and built forms. Example Furniture, Carpentry Joints, built environment.

Unit-4

Architectural Rendering -1

Introducing Basic rendering techniques with pen and ink- shading and material textures. Visual presentation of plants, trees, objects, furniture, human beings etc. Study of objects in light and shade, sketching techniques. Drawing free hand Isometric view of built forms and elements, shadingand texture with pencil and ink rendering.

Course Outcomes:

COURSE OUTCOMES

1. Explore the visual representation through drafting, lettering and use of concept of scale.
2. Demonstrate techniques of orthographic projection.
3. Represent two dimensional objects in three dimensional forms through studio drafting and free hand sketching
4. Employ graphical presentation skills for effective communication in design.

REFERENCES:

1. N.D. Bhat "Engineering Drawings"
2. I.H. Morris. "Geometrical Drawing for art students"
3. K.R. Gopalkrishna "Engineering Drawings (vol-1&2)"
4. "Architectural Graphics" by C. Leslie Martin
5. "Architectural Graphics" by Francis D K Ching

4. HISTORY OF ARCHITECTURE – I

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR1040	HISTORY OF ARCHITECTURE - I	PC	3	1	0	2

COURSE OBJECTIVES:

1. To familiarize the students with development of architecture in the Ancient times
2. To familiarize students with the cultural and contextual determinants that produced that architecture.
3. To describe architectural evolution as a product of cultural contexts including aspects of politics, society, religion and climate.
4. To explain the development of architectural form with reference to Technology, Style and Character in the prehistoric world and in Ancient Egypt, West Asia, Indus valley, Greece and Rome

COURSE CONTENTS:

UNIT- I

PREHISTORIC AGE & ANCIENT RIVER VALLEY CIVILIZATIONS: MESOPOTAMIA

Introducing concepts of culture and civilization – Paleolithic to Neolithic Culture – art forms and evolution of shelter – megaliths – agricultural revolution and its impact on culture and civilization.

Examples such as dwellings from Paleolithic and Neolithic age, Stonehenge etc.

West Asian Architecture – Sumerian, Babylonian, Assyrian and Persian culture – evolution of city-states and their character and architecture – evolution of the ziggurat and palaces.

Examples such as White temple at Warka, Ziggurat of Ur, Urnamu, Ishtar Gate, Palace of Sargon at Khorsabad, Palace at Persepolis

UNIT-II -

EGYPTIAN CIVILIZATION

Landscape and culture of Ancient Egypt – history – religious and funerary beliefs and practices –monumentality – tomb architecture: evolution of the pyramid, Mastaba, palaces, temple architecture: mortuary temples.

Examples such as Obelisk, sphinx, pylon, Mastaba-Aha at Sakkara, Step pyramid of Zoser, Bent pyramid, Great Pyramid of Cheops, Temple of Khons at Karnak, temple of Mentuhetep

INDUS VALLEY CIVILIZATION – Harappa, Mohenjo-Daro, Great bath, Granary & town planning

UNIT-III

CLASSICAL PERIOD: GREECE

Landscape and culture of Greece – Greek culture – Hellenic and Hellenistic cultures – Greek character – Greek city planning – architecture in classic periods ; Public Buildings- Greek temple: evolution and classification- Greek Orders in architecture: Doric, lonic, Corinthian .

Examples such as The Acropolis, Theatre Epidaurus, Agora, Stoa, The Parthenon, The Erechthion

UNIT-IV-

CLASSICAL PERIOD: ROME

Roman history: Republic and Empire – Roman religion and the Roman temple – Roman urban planning – art and architecture as imperial propaganda: forums and basilicas- structural forms,

materials and techniques of construction – Roman orders – Tuscan and Composite, Enclosure and manipulation of space- Public Structures
Examples such as Forum Romanum , Basilica of Trajan , The Pantheon, column of Trajan, Arch of Septemius Severus, Roman Colloseum, aqueduct, thermae

COURSE OUTCOMES:

The students shall be able to
1. Trace the evolution of architecture in the prehistoric, ancient river valley civilizations and Classical period.
2. Demonstrate an understanding of socio cultural context, climatic influences and technical advancement with reference to various styles of architecture
3. Illustrate construction techniques, architectural characteristics and structural forms of the period
4. Acquire skills and techniques to describe historical buildings through various media such as sketching, audio visual presentations, model making etc.

REFERENCES:

- Sir Banister Fletcher, "A History of Architecture", CBS Publications (Indian Edition),1999.
- Spiro Kostof, "A History of Architecture: Setting and Rituals, Oxford University Press, London, 1985.
- Leland M Roth; "Understanding Architecture: Its Elements, History and Meaning"; Craftsman House; 1994.
- Pier Luigi Nervi, General Editor, "History of World Architecture – Series", Harry N. Abrams, Inc. Pub., New York, 1972.
- Lloyd S. and Muller H.W., "History of World Architecture – Series", Faber and Faber Ltd., London, 1986.
- Gosta, E. Samdstrp, "Man the Builder", Mc.Graw Hill Book Company, New York, 1970.
- Webb and Schaeffer; "Western Civilisation", Volume I; VNR: NY: 1962.

1. ENVIRONMENTAL STUDIES

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR1050	**ENVIRONMENTAL STUDIES**	BS	2	2	0	0

COURSE OBJECTIVES

1. Emphasize the importance of environmental studies in the context of built & unbuilt environment shaped by architects.

2. Enlist the various components of the environment including the various types of energy and natural resources.

3Impart knowledge with respect to biodiversity, its threats and its conservation and appreciate the concept of ecosystem.

4.Familiarize students with threats to our environment & ways for protecting the environment.

COURSE CONTENTS:

UNIT I: Introduction
Basic definitions, Objectives and Guiding principles of Environmental Studies in relation to architecture, Components of Environment, Structures of atmosphere, Man-Environment relationship, Impact of Technology on the environment , Environmental Protection Acts and policies – Role of Government, Legal aspects, Initiatives by Non – Governmental Organizations (NGO), Community participation and awareness – through architectural examples

UNIT II: Energy & Natural Resources
Energy – Different types of energy- Conventional and Non-Conventional sources of energy, alternative source of Energy used through present day examples, conservation of natural resources.

UNIT III: Ecology & Ecosystems
Impact of human civilizations on the earth's major Ecosystem, Forests, Oceans & Atmosphere. Assessing the impacts and ways for its mitigation, Energy flow in eco-system, Land use matrix – Consumption, Carbon Footprint, Ecological Footprint, Bio-diversity

UNIT IV: Environmental Pollution

Environmental Degradation, Pollution, Sources of Pollution, Types of Environmental Pollution, Current Environmental Global issues, Global Warming & Green Houses, Effects, Understanding of environmental pollution and its impact through case-studies. Role of an individual in prevention of pollution. Disaster management: Floods, earthquake, cyclone and landslides.

Course Outcomes:
On completion of this course the students will be able to**:**
1. Comprehend the various components of the environments and its stakeholders
2. Enlist the Sources of energy with a focus towards innovative, renewable sources.
3. State the ecological imbalances and measures to protect it.
4. Assess the environmental conditions, causes of pollution and provide solutions towards its protection

REFERENCE BOOKS:

1. Raman Sivakumar, (2005), "Principles of Environmental Science and Engineering", Second Edition, Cengage learning, Singapore
2. Meenakshi P. (2006), "Elements of Environmental Science and Engineering", Prentice Hall of India Private Limited, New Delhi
3. Prakash S.M. (2007), "Environmental Studies", Elite Publishers, Mangalore
4. Erach Bharucha (2005), "Text Book of Environmental Studies", for UGC, University Press
5. Tyler Miller Jr. G. (2006), "Environmental Science – Working with the Earth", Eleventh Edition, Thomson Brooks/Cole
6. "Text Book of Environmental and Ecology" by Dr. Pratibha Sing, Dr. Anoop Singh and Dr. Piyush Malaviya.

2. Technical English I

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR1060	TECHNICAL ENGLISH	SE	2	0	0	2

Course Objectives:

1. To prioritize listening, writing and reading skills among learners.
2. To introduce required speaking and communication for a professional working Environment.
3. To simplify writing skills needed for academic as well as workplace context.
4. To ascertain if learners utilise the electronic media such as the internet and supplement the learning materials used in the classroom.

Unit 1

Functional English

Grammar: Prepositions; Modal Auxiliaries

Listening: Listening to audio (verbal & sounds)

Speaking: Debating Skills

Reading: Skimming a reading passage; Scanning for specific information

Writing: Email communication

Unit II

Interpersonal Skills

Grammar: Tenses; Wh-questions

Listening& Speaking: Listening and responding to video lectures / talks

Reading: Reading Comprehension; Critical Reading; Finding key information in a given text

Writing: Process descriptions (general/specific); Recommendations

Unit III

Multitasking Skills

Grammar: Conditional Sentences

Listening & Speaking: Listening to specific task; focused audio tracks and responding

Reading: Readingand interpreting visual material

Writing: Channel conversion (flowchart into process); Types of paragraph (cause and effect / compare andcontrast / narrative / analytical); Note Taking/ Note Making

Unit IV

Communication Skills Grammar:

Directand indirect speech

Listening & Speaking: Watching videos / documentaries and responding to questions basedon them; Role plays

Reading: Making inference from the reading passage; predicting the content of a readingpassage

Writing: Interpreting visual materials (line graphs, pie charts etc.); Different types of

EssayWriting

COURSE OUTCOMES:

1. Communicate effectively in technical English through reading, writing and speaking
2. Demonstrate writing skills with proper usage of English language grammar
3. Illustrate nuances of critical thinking and report writing required for professional education.
4. Imbibe a professional attitude among peers for collaborative working through all of the softskills

REFERENCES:

1 Taylor, Grant English Conversation Practice TMH
2 Mudambadithaya, G S Communicative English Made Easy Sapna
3 Thomson, A J & Martinet, A VA Practical English Grammar Oxford

SECOND SEMESTER

DETAILED SYLLABUS FOR II SEMESTER

1. Architectural Design – I

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR2010	ARCHITECTURAL DESIGN - I	PC	9	4	2	4

COURSE OBJECTIVES:

1. To explore relationship between form and function
2. To understand abstraction of form and generation of concept for an architectural design
3. To develop sensitivity towards site and surroundings.
4. To Translate behavioral needs into an architectural project

COURSE CONTENT:

INTRODUCTION TO FORM GENERATION- 3 to 4 weeks

Abstraction and Form Generation

Basics of form and function symbiosis. Studio exercises linked to form exploration in architecturaldesign applying model making techniques of working with Plaster of Paris, clay etc.

Introduction to Design of simple uni-functional spaces. Introduction to the problem, Requirementfinalization, concept development.

DESIGN OF HABITABLE SPACE- 7 to 8 weeks

Stage 1

Exercises relating personal experiences to behavioral needs and translating them into architecturalprogram requirements.

Introduction to design of a simple building within immediate observable environment.
Basicintroduction to the design of human habitat, its components and space standards.
Explore the relationship between human feelings and architectural form – observe aspects of design

like aesthetics, light, circulation, form guidelines for design;
Case studies, case study documentation and presentation,
Concept, Single line plan, translating between 2D and 3D to resolve the plan using study models.
Stage 2
Double line plans, 3D visualization through models, elevations, sections, site plan, application ofrendering and presentation technique to all drawings.
Student shall explore different materials for making models.

COURSE OUTCOMES:
The students are able to

1. Infer, understand and relate the relationship between space & Activities.
2. Develop & express design concepts towards solving design problems
3. Interpret the design problem and propose solutions with sensitivity towards site, context andspace efficiency.
4. Acquire skills in architectural representations to represent behavioral needs through 2D and 3Dmedia.

REFERENCES:

1. Wucius Wong "Principles of two-dimensional designs"
2. Francis D.K. Ching "Architecture-form space and order".
3. Robertson Howard "The principles of architecture composition"
4. Leon Baptista Alberti "The Ten Books of Architecture"
5. John Hanock "Time Saver Standards for Architectural Design Data"
6. Ramsay and Sleeper "Architectural Graphic Standards"

2. Structural systems and construction-II

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR2020	STRUCTURAL SYSTEMS & BUILDING CONSTRUCTION & MATERIALS - II	BS	5	2	0	5

COURSE OBJECTIVES:
1. Outline the basic structural loads, support systems and equilibrium of forces and describe theproperties of timber in carpentry and Joinery, its usage in Doors and window
2. Demonstrate the structural behavior of timber through concept of triangulation load transfer
3. Introduce Graphic vector analysis, Modulus of Elasticity, Stress strain relation
4. Illustrate through drawings the principles of staircase design and details of Timber staircases.

COURSE CONTENT:

UNIT-I

Evolution of Structures: Historical perspective and definition of structure as a device for channeling loads that result from the use or presence of the building in relation to ground. Built structure, components, forces, loads, types, different roofing system
Building system: Structural and enclosure system, Types of construction, Structural forces, Structuralequilibrium, Columns, beams
Structural Materials: Basic Mechanical properties of structural materials a)Timber b) Masonry c) Steel d)Concrete.
Experiment with Structures: Boiled egg, Paper structure to withstand load, Bridge using sticks, simpleexamples for structural understanding.

UNIT-II

Application of Timber as a Structural material: Study of structural system using timber posts andrafters, typical junction details

Loads on Structures: Dead load (DL), live load (LL).

Principle of transmissibility of forces: Understanding load flow by tributary load and load path (slab,beam, and girder) and vertical members (post, wall, and footing); load path. Force and stress **Equilibrium of Forces:** Force, Reaction, Moment and Principle of Support conditions and theirsignificance in resistance to forces and to maintain equilibrium.

UNIT-III

Basic principles of mechanics: Tension, compression
Stress/strain relations (Hooke's Law): Modulus of Elasticity, linear and non-linear materials, elastic,plastic, and elastic-plastic materials; Poisson's Ratio; Thermal stress and strain.
Graphic vector analysis: Resultant and equilibrant of coplanar, concurrent and non-concurrent forcesystems. Parallelogram, force polygon, resultant, equilibrant, components; numeric method **Application of Concrete as a Structural material:** Broad Overview of the different structural systems
in R.C.C, Basic Introduction to Concrete as a building material.

UNIT-IV
Truss: Truss concept of triangulation, common truss configurations.
Truss loads and reactions: For a given configuration of the trusses and center to center spacing, calculations of the dead weight of the truss and the dead weight of the roof cover and support reaction loads.

Timber Truss: Typical junction details

Site / field visit: Regular site visits to construction sites and buildings to understand the practicalimplication of classroom learning.
2 to 4 plate from each unit, sketch books and material portfolio to be prepared

COURSE OUTCOMES:

The students will be able to
1. Interpret the concept of loads, support systems and equilibrium of forces through problem solvingand apply knowledge of Joinery in design of Timber doors and windows.
2. Explore different types of roof trusses based on the spans in timber
3. Describe the different vector forces, Modulus of Elasticity, Stress strain relation graphically, andthrough problem solving.
4. Apply the knowledge in designing and detailing of timber staircases.

REFERENCES:

1. Building Construction Hand book, Roy Chudley and Roger Greeno, Routledge, London
2. Building Construction, Sushik Kumar, Standard Publishers Distributors, New Delhi
3. Building Construction, Punmia, Ashok K Jain, &Arun K Jain, Lakxmi Publications (P) Ltd, NewDelhi
4. Building Construction Illustrated, Francis D K Ching, John Wiley & Sons, Inc, New York.

3. Architectural Representation-II

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR2030	Architectural Representation-2	PC	5	2	0	3

COURSE OBJECTIVES:

1. Demonstrate skills in technical representation of geometric forms and development of lateral surfaces and sections of solids
2. Introduce the techniques of perspective drawings-one point perspective and 2point perspective
3. Introduce the techniques of perspective drawings of built environment
4. Explain the techniques of light and shadow in a built environment.

COURSE CONTENT:

Unit-1 Section of solids

Exercise -True shapes of sections for simple geometric forms (Prism, Pyramid, & cone).

Development of surfaces

Development of lateral surfaces of Solids - Polyhedral (Cube – Tetrahedron – Prisms, Pyramids cone and Cylinder), its application to build forms, Suggested examples: Domes.

Inter-penetration of geometric solids

Basic understanding of combination of different forms.

Unit-2

Perspective drawings

Introduction to perspective drawings and understanding of picture plane, station point, vanishing point, eye level, ground level, their variation and their resultant effects.

One-point perspective drawings

Generate multiple perspective drawings by altering the VP and PP, and by keeping SP fixed for the simple geometric objects. Perspective drawings of everyday objects like chair and table. Perspective drawings of simple built form -interior or exterior of building.

Unit-3

Point perspective drawings

Exercise-Perspective drawings of simple geometrical objects and their combinations. Perspective drawings of simple everyday objects. Sketching Perspective view of built forms-Interior or exterior of building.

Unit-4

Architectural Rendering-2

Introduction to Sociography: Learning about light, shade and shadow on built forms. Introducing to rendering techniques of plans, elevations, sections with ink and colour Basics of colour theory, free hand rendering of landscapes & built scapes including human Figures and street elements for the perspective view of buildings. Understanding the importance of colour schemes in design presentation as well as its application on built form.

Course Outcomes:

1. Explore the skills in technical representation of geometric forms
2. Draw perspective views of interior elements of a building
3. Draw perspective views of the exterior of a built environment
4. Explore the techniques of light and shadow using sciography

REFERENCES:

5. N.D. Bhat “Engineering Drawings”
6. I.H. Morris. “Geometrical Drawing for art students”
7. K.R. Gopalkrishna “Engineering Drawings (vol-1&2)”
8. “Architectural Graphics” by C. Leslie Martin
9. “Architectural Graphics” by Francis D K Ching.

4. History of Architecture – II

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR2040	HISTORY OF ARCHITECTURE - II	PC	3	3	0	0

COURSE OBJECTIVES:

1, To outline the evolution of architecture in the Western World from early Christian period till late renaissance.
2. To describe architectural evolution as a product of socio cultural contexts including aspects of politics, society, religion and climate.
3. To explain the development of architectural form with reference to Technology, Style and Character.
4. To familiarize the students with different stylistic variations as seen in architectural styles from early christian to late medieval period.

COURSE CONTENT:

UNIT-I
EARLY CHRISTIAN &BYZANTINE -
Architectural Character and various influences over Early Christian architecture in Italy
Church planning – Basilican concept: St. Peters Rome (old), St. Clemente
Tombs- tomb of Gala Placidia, Baptisteries – Baptistery of Constantine
Architectural Character and various influences over architecture in Byzantine
Centralized plan concept: S. Hagia Sophia, Constantinople; St. Marks, Venice

UNIT-II
EARLY MEDIEVAL PERIOD -
Introduction to Romanesque architecture, Architectural character, influences etc
Architectural Character & building techniques of Romanesque architecture of
Italian Romanesque churches, development of vaulting, building techniques, Pisa Group
French Romanesque architecture with examples such as Abbey aux Hommes
British Romanesque architecture with examples such as Peterborough cathedral

UNIT-III
LATE MEDIEVAL PERIOD -
Introduction to Gothic Architecture, influences and Architectural Character
Development of Gothic architecture Church plan, structural developments, building techniques with examples –
France – Gothic Character with examples such as Cathedral of Notre Dame
England - Gothic Character with examples such as Salisbury Cathedral
Italy - Gothic Character with examples such as Milan cathedral

UNIT-IV –
RENAISSANCE AND BAROQUE –
Introduction to Renaissance architecture, Renaissance architectural character and building technique
Italy –Contribution of Brunelleschi, Palladio and Michelangelo with examples; Palazzos; St.Peter's Rome
France –Renaissance architectural character with examples such as Soufflot's Pantheon Paris
England – Renaissance architectural character with examples such as Christopher Wren's St. Paul's Cathedral
Brief Introduction to Baroque & Rococo Architecture

Examples are indicative in nature and are subject to changes.

COURSE OUTCOMES:

On the successful completion of this course the students shall be able to

1. Trace the evolution of architecture in the west from the early Christian to late medieval period.
2. Demonstrate an understanding of socio cultural context, climatic influences and technical advancement with reference to various styles of architecture.
3. Illustrate construction techniques and architectural characteristics of the period
4. Acquire skills to describe historical buildings through various media such as sketching, audio visual presentations, model making etc.

REFERENCES:

1. Toman, Rolf , History of Architecture From Classic to Contemporary. Parragon
2. Sir Banister Fletcher, A History of Architecture, CBS Publishers
3. Ching, Franicis D K A Visual Dictionary of Architecture Van Nostrand Reinhold
4. Rodgers, Nigel The Rise & Fall of Ancient Rome Anness
5. Thomary Edith A History of Fine Arts in India and West Orient Longman
6. Yatin Pandya Elements of Space Making

5. Model Making

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR2050	ARCHITECTURAL MODEL MAKING	PC	2	0	0	2

COURSE OBJECTIVES:

1. Introduction to basic technique of surface development using lightweight materials
2. Train in basic skills and creative use of various materials for model making
3. Demonstrate techniques of making models to scale
4. Explain the usage of conventional model making materials such as mount board, paper, foam board, balsa wood for architectural models

COURSE CONTENT:

UNIT-I

Introduction to different materials, Surface development using paper, making basic shapes out of different materials to explore the nature & texture of the material, Choose from Plaster of Paris, cement, wire mesh etc.

UNIT-II

Geometrical shapes in varied materials. Choose from materials such as clay, Pottery and papier Mache etc.

UNIT-III

Exercises involving creating small study models for architectural projects, understanding of scale, material usage for various elements such as building components (walls/ openings /staircase/ roofing), furniture etc. Usage of conventional model making materials such as mount board, paper, foam board, balsa wood etc.

UNIT-IV

Exercises involving creating large scale study models for architectural projects including buildings, site detailing on model, landscape elements, street furniture etc. Color scheme and textures for large scale architectural models. Innovative use of various model making materials to achieve the desired texture and form.

COURSE OUTCOMES:
The students shall be able to
1. Make models of desired texture and form
2. Explore the different types of materials and its feasibility in model making.
3. Use suitable materials for Architectural models
4. Prepare scaled models using innovative techniques for the corresponding architecture studio design

REFERENCES:

1 Gill, Rober W Rendering with Pen + Ink Thames & Hudson
2 Ching, Franicis D K Architectural Graphics John Wiley
4 Ching, Franicis D K A Visual Dictionary of Architecture Van Nostrand Reinhold

5. Technical English II

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR2060	Technical English II	SE	2	0	0	2

Course Objectives:

1. To illustrate application of language skills effectively in real-life scenarios.
2. To develop the learners' competence to ensure employability.
3. To improve the habit of writing, leading to effective and efficient communication
4. To prioritize specially on the development of technical reading and speaking skills among the learners.

Unit I
Language Acquisition

Grammar: Active and passive voice

Listening & Speaking: Listening to informal conversations and interacting

Reading: Developing analytical skills; Deductive and inductive reasoning

Writing: Giving Instructions; Dialogue Writing

Unit II
Persuasive Skills
Grammar: Compound words; Phrasal verbs
Listening: Listening to situation based dialogues
Speaking: Group Discussions
Reading: Reading a short story or an article from newspaper; Critical reading
Writing: Formal letters (Accepting/ inviting/ declining); Personal letters (Inviting your friend to a function, congratulating someone for his / her success, thanking one's friends / relatives)
Unit III
Cognitive Skills
Grammar: Homonyms; homophones
Listening: Listening to conversations; Understanding the structure of conversations

Speaking: Presentation Skills
Reading: Extensive reading
Writing: Report Writing (Feasibility/ Project report - report format – recommendations/ suggestions - interpretation of data using charts, PPT); Precis Writing

Unit IV

Employability Skills

Grammar: Idioms; Single Word Substitutes

Listening: Listening to a telephone conversation; Viewing model interviews (face-to-face, telephonic and video conferencing)

Speaking: Interview Skills, Mock Interviews

Reading: Reading job advertisements and the profile of the company concerned

Writing: Applying for a job; Writing a cover letter with résumé / CV

Course Outcomes:

On completion of the course, learners will be able to:

1Organize their opinions clearly and meaningfully through analytical skills, deductive and inductive reasoning

2. Demonstrate the ability to speak appropriately in social and professional contexts through persuasive skills

3. Build inferences from the text and improve report writing through cognitive skills
4. Participate in interviews confidently and develop accurate writing skills for covering letter, using different components of academic writing.

REFERENCES:

1. Taylor, Grant English Conversation Practice TMH

2 Mudambadithaya, G S Communicative English Made Easy Sapna

3 Thomson, A J & Martinet, A V A Practical English Grammar Oxford

5. Constitution of India

6.

Course Code	Course Title	Type	Total Credits	Contact Hrs		
				L	T	P
B18AR2070	Constitution Of India	PC	2	2	0	0

COURSE OBJECTIVES

1. Discuss the constitution of India and evolution of constitutional law and citizenship
2. Enumerate the scope and extent of fundamental rights and duties and directive principles of state policy
3. Describe the roles and duties of the leaders of the country and the process of election
4. Define the term amendment and describe the various amendments, special provisions and emergency powers

COURSE CONTENT:

UNIT I

Preamble to Constitution of India – Evolution of Constitutional Law
Indian Tricolour Flag: its features and significance.
Scope and Extent of Fundamental Rights under Part III – Details of Exercises of Rights, Limitations and Important Cases

UNIT II

Relevance of Directive Principles of State Policy under Part IV
Significance of Fundamental Duties under part IV (a)

UNIT III

Union Executive President, Vice-President, Prime Minister, Council of Ministers, Parliament and Supreme Court of India
State Executive, Governor, Chief Minister, Council of Ministers, Legislature and High Courts
Electoral Process and special provisions: Electoral process in India.

UNIT IV

Amendment procedures: 42nd, 44th, 74th, 76th, 86th and 91st Amendments
Constitutional provisions for scheduled castes and tribes; special provisions for Women and Children and Backward Classes
Emergency Powers

COURSE OUTCOMES:

After completion of the course the student shall be able to:

1. Outline the constitution of India, constitutional law and the rules of citizenship
2. Cite the fundamental rights and duties and the pricnicple related to state policies
3 Outline the roles and duties of the leaders of the country and realize the process of election
4. Examine and interpret the amendments, special provions and emergency powers of the leaders

REFERENCES:

1 Basu, Durga Das Introduction to the Constitution of India V K Publishers
2 Pylee, M V Constitution of India Vikas Publication, New Delhi, 2007

THIRD SEMESTER

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3010	**Architectural Design – II**	PC	2	2	4	9	8

COURSE OBJECTIVES:

1. To identify relation between site, building and user requirements.
2. To interpret building construction knowledge and apply it to design.
3. To recognize the relevance of incorporating fenestrations in building design
4. o express through design the articulation of interior volumes, light and movement

Studio Theme- *Site and Context*

COURSE CONTENTS

Stage 1: 6 to 7 weeks

Design of a building for public activity spread over more than one level.

Introduction to the problem, Case studies, case study documentation and presentation, Requirement finalization, Site study, site analysis, concept development, bubble diagram, User Space matrix, Proximity matrix and Site zoning.

Single line development of floor plans based on function and concept.

Development of site plan, double line plans, basics of parking and standards, study models, roof plan, massing, elevations, sections, site plan.

Stage 2: 4 to 5 weeks

Detailed Design

Detailing of one component of the built- space within the whole design (Special study) with emphasis on openings, façade treatments, structural framework, materials etc

Development of the design with furniture layout, treatment of open spaces, detailed sections, perspectives and models. Students are encouraged to try software knowledge gained for some part of the presentations.

COURSE OUTCOMES:

The student shall be able to

1. Apply suitable design philosophy for public use spaces.
2. Extend the knowledge gained in Building construction and Structures to the Architectural design project
3. Demonstrate an ability to design a space using anthropometrics.
4. Explore the relation of built to unbuilt spaces.

REFERENCES:

1. Neufurt, Ernst architect's data. Crosby Lock Wood and Sons
2. Time Saver Standards for Architectural Design Data. McGraw Hill.
3. An Introduction to predesign. Naresh Shah, NIASA publication.

2. Structural systems and building construction-III

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3020	**STRUCTURAL SYSTEMS &BUILDING CONSTRUCTION& MATERIALS - III**	BS	**4**	**3**	**1**	**7**	**7**

COURSE OBJECTIVES

1. Acquire the knowledge of different types of Door and openings with UPVC and Aluminum
2. Outline the special opening in buildings and plastics in construction industry
3. Explain the RCC mechanics with respect to building components and introduce traditional roofing methods
4. Describe the different type of beams and design of slabs in RCC

CONTENTS:

UNIT I

- Introduction to staircase, terminology, types and detailing of timber staircase
- Doors: Introduction to doors, frames, parts of door, types of doors, detail study of panel doors with glass, flush doors, and louvered door.
- Materials: Timber, Aluminum, UPVC, frame sections and beading details.
- Sliding door, folding door, sliding and folding door, sliding window (wooden and aluminum)

UNIT 2

- Windows: Introduction to wooden windows – detail study of simple casement windows, wooden shutters, glazed wooden shutters, fanlights, top hung ventilators, fixed window, horizontal and vertical pivot windows, and louvered windows, double glazing, fixed and sash windows.
- Special openings: dormer windows, corner, bay window in timber.
- Skylights-Study and details of different types of skylights.
- Materials Study: Plastics as a building material, types, properties and uses of plastics such as polycarbonates, acrylics, PVC polymer films, and fiber reinforced plastic, glass reinforced plastics. Application and details.
- Market study- rolling shutters, collapsible gates

UNIT 3

Bending moment and shear force diagrams: concept of bending moment and shear force. BMD and SFD for different types of beams subjected to loads.

Deflection of beams: concept of deflection of different types of beams and different loading condition.

- Mechanics of Reinforced Concrete: Properties of Concrete, Compression and tension in Concrete and Structural behavior under load and the need for reinforcement.
- RCC Materials: Basic Characteristics of Concrete & Reinforcing Steel Materials including specifications and testing.
- Study of Roof / Floor: Brick jack arch, flag stone floors, Jack arch floor, madras terrace, ordinary flat brick floor.

UNIT 4:

- Detailing of singly reinforced beams and Doubly reinforced beams
- Structural principles and design of one way and Two-way Concrete slab system,

Principles of temporary works such as shuttering, centering and scaffolding, Form work, Centering and scaffolding materials used for these temporary structures - timber & steel.

Site / field visit: Regular site visits to construction sites and buildings in order to understand the practical implication of theoretical inputs.

<u>COURSE OUTCOME</u>:

Students will be able to:

- llustrate knowledge gained on Fenestrations with Aluminium and UPVC as a material
- Describe graphically windows, special openings and roof openings and gain material knowledge on plastics and other market varieties.
- Discuss and resolve the mechanical property and behaviour of RCC on elements of building and acquire knowledge on traditional roofing systems.

- Structural behavior and design of RCC slabs and beams

TEXTBOOKS:

- Building Construction, Sushil Kumar, Standard Publishers Distributos, New Delhi.
- Building Construction, B C Punmia 10th and 11th edition, Laxmi Publications (P) ltd, New Delhi.
- Building Construction Handbook, 10th and 11th edition Roy Chudley and Roger Greeno, Routledge, London**.**

REFERENCES:

- Strength of materials by Ramarutham, Dhanpat Rai publications
- Strength of materials by S S Bhavikatti, C CHAND publications
- Design of structural elements (RCC vol-1) by SS Bhavikatti New age international publication.
- Design of reinforced concrete structures III edition by Krishnaraju.

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3030 **(MPA17F3910)**	Creative elective **Contemporary Dance** **(MPA17F3910** (Music/Dance/Theatre)	PC	2	0	0	2	2

Course Objectives

1.To develop an understanding of Contemporary Dance and its universal application.

2.To be able to understand the fine nuances of Contemporary dance.

3. To understand the importance of health through Contemporary dance, strengthen the body capacity.

Unit 1

- Basic warm ups and cool down
- Across the floor exercises

Unit 2

- Body anatomy
- Floor work, Stretches and moves

Unit 3

- Aspects of contemporary dance
- Techniques of contemporary choreography

Unit 4

- Contemporary dance history
- Choreography and Improvisation

Course Outcomes

1.To be able to identify and appreciate Contemporary Dance.

2.To be able to execute basics steps with finesse.

3. To be able to perform for songs in Contemporary Dance style.

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3030 **(MPA17F3920)**	Creative elective **Indian Classical Music** (Music/Dance/Theatre)	PC	2	0	0	2	2

Course Objectives:

- To imbibe the music skills.
- To understand the importance of shruthi (Pitch/Scale), laya (Tempo), tala (Rhythm).
- To understand the basic exercises and the basic ragas taught in Hindustani music.

Course Outcomes:

On successful completion of this course, students should be able to:

- To be able to sing in Shruthi.
- To understand the Raga and Tala
- To be able to get more concentration in studies
- To identify some important ragas through the compositions taught.

UNIT – 1

- Alankars – Training for voice Culture
- Rendition of Alankars in three speeds

UNIT – 2

- Introduction to Raag Bhoopali
- Swarageeth, Lakshanageeth and Chota Khyal in Raag Bhoopali

UNIT – 3

- Introduction to RaagYaman
- Swarageeth, Lakshanageeth and ChotaKhyal in RaagYaman

UNIT – 4

- Bhajan/Bhaavageethe in RaagBhoopali and RaagYaman

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3030 (MPA17F3930)	Creative elective **DRAMATICS** (Music/Dance/Theatre)	PE	2	0	0	2	2

Course Objectives:

•To imbibe the acting skills.

•To understand the broader applications of theatre studies in allied arts forms.

•To be able to use body language for better communication.

• Students shall also be able to understand voice modulation and Navarasas.

Course Outcomes:

On successful completion of this course, students should be able to:

• Freely express improvisation in non-verbal communication.

•Shall hone good acting skills and be able to emote better.

• Be able to put up a theatre act and play a key role.

• Be able to differentiate good acting and understand the importance of good lyrics, stage crafting, music, dance, costume and lighting.

UNIT – 1

Working on Body:
Body and its analysis. Understanding physical abilities (Anga, Pratyanga and Upanga). Challenges ofthe body. Using body as metaphor and language. The class's bodies as a collective, an ensemble, a collaborative team.

UNIT – 2

Sound and Movement:

Awareness of creating sound patterns, voice modulations, rhythm in speech and diaologues. Understanding the rhythm and patterns of movements like walking, framing, shaping, primitive and animal movements.

UNIT – 3

Characterization and Improvisation:

Observation of people around. Getting into the role and living it. Developing a character from establishment (pace and rhythm).Improvisation techniques of body and mind.

UNIT – 4

Group work and Production:

Develop a theme, concept or a play and include all the theatre skills, stage craft, costuming and put up an act. Choosing theme and characters.

REFERENCE BOOKS:

1. *All about Theatre – Off stage – Chris Hogget.*
2. *Rangadalli Anataranga – K V Subbanna*
3. *The Indian Theatre – Hemendranath Das Gupta.*
4. *A Practical handbook for an Actor – MilisaBruder, eeMilchel Cohn, Madeleine Oliek et al, Zigler Publisher.*

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3040	**Building Services I**	BS	2	0	0	2	2

COURSE OBJECTIVES:

1. Trace the evolution of the water supply, health and sanitation systems through history to current day practices
2. Illustrate the process of water supply, from source to consumer and tabulate per capita water requirement
3. Describe the sanitary system, storm water management and solid waste management.
4. Demonstrate how all three systems: water supply, plumbing and sanitation are incorporated in a building design

COURSE CONTENTS:

UNIT I:

Introduction to Environment and Health Aspects:

History of Sanitation with respect to human civilization.
Importance of Health, Hygiene Cleanliness.
Water borne, Water related, Water based, Epidemic diseases.
Conservancy to water carriage system. Urban and Rural sanitation.

Water Supply:

Source of Water supply.
Quantity of water for different usages like Domestic, Commercial, Industrial Applications.
Rate of demand and Assessment of requirement for different users.
Quality of supply for different users as per national and international standards.
Treatment of water for different uses.

Storage and pumping – gravity system, hydro-pneumatic system.
Distribution of water to fixture and fittings, schematic diagrams.
Swimming pool, water bodies.
Efficient usage of water for firefighting.
Sump and OHT calculation design.

UNIT II:
Sewerage System:
Assessment of sewage generated.
Collection of sewage/ wastewater from all sources. Different systems of sewerage - schematic diagrams.
Conveyance of sewage, sewer appurtenances – gully trap, chamber, manhole, intercepting trap, grease traps, backflow preventer.
Materials of construction of sewerage network. Ventilation of sewers.
Objective of Sewage treatment, type of treatment, aerobic, anaerobic.
Storm water Management:
Assessment, quantification of rainfall, flood control measures.
Drainage system–piped drains, open drains.
Recharging of storm water, Harvesting of roof top water.
Drainage of basements, podium, paved areas.
Collection, Reuse of water with in the project, reduction of the load on municipal system.
Landscape drainages and Rainwater harvesting. Recharging ground water table.
Terrace plan with Rain water down take pipes.

UNIT III:
Plumbing:
Water supply piping–hot, cold and flushing water.
Piping in sunken areas and false ceiling areas.
Shaft sizes. Drainage – floor traps, drains, P-trap, bottle traps.
Systems of house drainage: One pipe system, two pipe system, single stack, two stack, cross venting, fixture venting.
Material of construction like GI, PPR, PB, CPVC, Composite pipes, Copper.
Flow control Valves – Gate valve, Globe valves, butterfly valves, Pressure Reducing valves.
Plumbing of small houses: Layout of Water supply and Sanitation with all fixtures in Kitchen, Bath and Utility for a small Residence with Plan and Section.
Special requirements: Central LPG Supply System, Central Waste Collection.

UNIT IV:
Sanitary Fixtures, Fittings & Wellness:
Soil appliances: Water closets, Bidet, urinals, Cisterns, Flush valve.
Waste appliances: Wash basin, sink, dishwasher, washing machine.
Hot water system: Geysers, boilers, heat pump, Solar Hot Water Generation.
Bath & water fixtures: Taps, mixers, single lever, quarter turn, bathtub, multi-jet bath, rain showers, health faucets.
Wellness products: Sauna bath, steam bath, Jacuzzi, single and double stack system.
Solid Waste Management:
Assessment of waste, Waste to wealth concept.
Types of waste: Municipal waste, garden waste, organic & inorganic, Commercial waste, Medical waste & Industrial waste,
Process: Collection, segregation, treatment, disposal,
Organic waste treatment processes– Bio-methanation, Vermi-composting, Organic waste converter.

Site Visits:
Water/ Sewage Treatment Plants. Small Residential Building: to observe water supply, sanitary system & plumbing. Organic waste treatment center.

COURSE OUTCOMES:

On successful completion of this course, students shall be able to:

1. Acquire knowledge on the evolution of the water supply, health and sanitation systems through history to current day practices. Trace the evolution of sanitary system with respect to human civilization.
1. Illustrate the process of water supply, from source to consumer and tabulate the water requirement per person per day.
2. Describe the sanitary system, storm water management and solid waste management.
3. Explore the sanitary system, storm water management and solid waste management.
4. Employ various plumbing systems in architectural design by drawing neat layouts.
3.

REFERENCES:

1	Rangwala	Water Supply & Sanitary Engineering	Charotar
2	McGhee, Terence	Water Supply & Sewerage	TMH
3	Husain, S K	Text book of Water Supply & Sanitary Engineering	Oxford
4	Deolalikar, S G	Plumbing Desing& Practice	TMH
5	Gahlot P S & Sharma, Sanjay	Building Repair and Maintenance Management	CBS
6	Mohan, C R &AnandVivek	Design and Practical hand Book on Plumbing	Standard Publishers
7	Kumara Swamy, N &Kameswara Rao, A	Building Planning & Drawing	Charotor
8	Bureau of Indian Standards	Special IS Code: SP- 35 – 1996	
9	Bureau of Indian Standards	Uniform Plumbing Code India 2012	
10	Karnataka Pollution Control Board	Pollution Control Board Norms	

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3050	History of Architecture-III-Buddhist and Hindu	PC	2	2	0	3	4

COURSE OBJECTIVES

1. To articulate a broad overview of the evolution of religious architecture (Buddhist and Hindu) in Indian Subcontinent
2. To describe the characteristics ,influences and distinguishing features of Buddhist and Hindu architecture
3. To facilitate an analytical approach towards study of historical buildings and styles.
4. To inculcate skills in describing historical buildings through various media such as drawing, model making, audio video documentation etc.

COURSE CONTENTS:

Detailed study & analysis of architectural styles in Buddhist and Hindu through significant examples; Socio-political background, Climatic & geographic influence; Construction technology & material; Design principles; Typology; Evolution; Spatial organization; Form & Detailing.

UNIT I

Ancient India: Vedic village architecture

Introduction to Buddhist architecture in India- Establishment of Buddhist school, its significance & contribution; Forms of worship, building typologies, symbolism; Stupas, Viharas, Chaitya halls, stambhas

Hindu forms of worship – evolution of temple form - meaning, symbolism, ritual and social importance of temple - categories of temple - elements of temple architecture –

Development of the Hindu temple form –

- Gupta Period- Udaygiri caves, temples at Deogarh & Bhittargaon;
- Early Chalukyan- Temple form at Aihole - e.g. Lad Khan & Durga temples
- Pallava Dynasty: Rock cut Architecture- mandapas, monolithic temples (Rathas); Pancharathas & Shore temple at Mamallapuram; Kailasanatha temple/ Vaikuntha Perumal Temple at Kanchipuram.

Characteristics and differences between Dravidian, Aryan/ Nagara and Vesara styles

UNIT II

Dravidian style –

- Chola Dynasty : Development of Chola style & capital, Influence from Chalukyan style; Brihadeshwara Temple at Tanjore
- Development under Pandya Dynasty- Development of Temple Citadel & Gopuram; e.g at Tiruvannamalai / Chidambaram.
- Temple Architecture under Madurai Dynasty: development of Prakaarams & spaces in Temple, example of Madurai Meenakshi Temple.
- Relation between Bhakti period and temple architecture - Temple towns of Kumbakonam/ Kanchipuram/ Srirangam/ Madurai / Rameshwaram.

Vesara style:

- Hoysala: Examples such as Chennakeshwara Temple at Belur/Hoysaleshwara Temple at Halebeedu/ Keshava temple at Somnathapur;

Vijaynagara dynasty: Vittala Temple / Virupaksha temple at Hampi, Settlement pattern of Hampi

UNIT III

Documentation/ Case study of any examples of Hindu / Buddhist architecture.

UNIT IV

Nagara style –

- Nagara Temples of Kalinga (Odisha) Dynasty: Types of Deulas - e.g. Lingraj/ Mukteswara/Jagannath Temples & Sun temple at Konark;
- Nagara Temples of Chandela Dynasty - Principles of shikhara & urushringa; Overview of Khajuraho group of temples; Kandariya Mahadev at Khajuraho
- Temple architecture of Gujarat- Sun temple at Modhera
- Jain Temple architecture-Planning aspects, Examples such as Dilwara temple at Mt. Abu/ Adinatha temple at Ranakpur

The examples to represent the historical styles are suggestive & students are encouraged to explore additional examples for a comprehensive understanding of the respective styles.

COURSE OUTCOME:

On the successful completion of this course the students shall be able to

1. Identify and understand the general characteristics of religious Architecture in the Indian subcontinent
2. Explore the evolution and development of architecture styles under various dynasties/regions
3. Demonstrate an understanding of sociocultural context, climatic influences and technical advancements and construction techniques with reference to various style of architecture
4. Acquire skills to describe historical buildings through various media such as sketching, audio visual presentations, model making etc.

REFERENCES:

1	Ram, Vikramajit	Elephant Kingdom Soulpture form Indian Arch	Mapin
2	Ching, Franicis D K	A Visual Dictionary of Architecture	Van Nostrand Reinhold
3	George Michel	Temple Towns of Tamilnadu	Marg
4	Sir Banister Fletcher	History of Architecture	
5	Brown Percy	Indian Architecture – Buddhist & Hindu	
6	Grover Satish	Architecture of India – Buddhist & Hindu	
7	Thomory Edith	A History of fine arts in India & the West	Orient Longman

Site survey and planning

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3060	SITE SURVEY AND PLANNING	PC	2	1	0	2	3

Objectives:

1. To understand the concept of site survey, landscape and its importance
2. To impart knowledge and skills related to surveying and levelling principles
3. To familiarize students with survey plans and their integration in the design process
4. To familiarize the students with the process of site analysis and various steps for site planning.

Stage 1: 2 to 3 weeks

Introduction of Landscape

Introduction of Landscape basic terminology. Various Landscape elements. Various types of vegetation and their impact on land. Water body as a landscape element. Land and types of Lanform.

Stage 2: 2 to 3 weeks

Site Survey / Site Analysis

Importance of surveying to Architects. Types and classification of survey. Principles of surveying character of work, shrunk scale. Definition of maps and understanding topographical maps of survey of India. Shrunk scale problems.

Chain Survey: Instruments used, Types of chain, Instruments for ranging, Setting out angles, erecting perpendiculars.

Plane table survey: Accessories, Advantages and disadvantages of plane table survey, basic definitions, principles of plane tabling, setting up and orientation, methods of plane tabling: radiation and intersection, plane table traversing.

Stage 3: 2 to 3 weeks

Leveling

Basic definitions, classification of leveling methods, types of levels- dumpy level, temporary adjustments of dumpy level, reduction of levels, plane of collimation method, problems, profile leveling- methods and application, fly leveling

Contouring: Characteristics of contours, direct and indirect methods of contouring, interpolation, and uses of contours.

Stage 4: 2 to 3 weeks

Site Planning

Site Planning: Things to consider and three phases for site planning process. Steps involved in site planning from Site analysis of identifying the landform and landscape features to commence site planning in accordance with the site and requirement

Course Outcomes:

1. Define and describe basic elements of landscape and landform.
2. Acquire skills for guiding and carrying out surveys for medium complexity sites.
3. Acquire knowledge and skills in levelling methods and site contours

4. Apply knowledge gained to conduct site analysis for design projects.

References:

1. Colise Brenda, Land and Landscape.
2. Punmia, B C, Jain, Ashok K & Jain, Arun K, Surveying Vol I
3. Punmia, B C, Jain, Ashok K & Jain, Arun K, Surveying Vol II
4. Roy, S K, Fundamentals of Surveying, PHI Learning Pvt. Ltd.
5. Bhavikatti S S, Surveying Thoery& Practice, I K International
6. Lynch, Kevin, Site Planning, IT Press, Massachusetts, 1962.
7. Trivedi, P. Pratibha, Beautiful Shrubs. Indian Council of Agricultural Research, Delhi, 1990.

Computer applications in Architectural Design–I

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR3070	CAAD–I	PC	3	0	0	3	3

Course Objectives:

The object of this course are,

1. To familiarize students with the digital interface in architectural representation
2. To introduce the students to digital media as a tool for architectural representation
3. To equip students with skills to explain and showcase their design through digital media.
4. Familiarize students with a range of digital tools and techniques in drafting and 3D modelling.

Unit-1

INTRODUCTION TO CAD

Introduction to CAD:2D commands, viewports, dimensions, annotations. Time problem introduction; Classroom exercises such as measured drawing of studio (windows, doors and staircases included), architecture department (windows, doors and staircases included) etc.

Understanding layers, paper space Vs model space, line weights, print set up and Modelling of Wall, Doors, Windows, Stairs etc. Single line plan of building.

Unit-2

INTRODUCTION TO 2D PRESENTATION

2D drafting: Presentation of time problem; plan, sections, elevations of a building, of single storied building, of previous semester architectural design studio project.

2D drafting: Presentation of time problem; floor plan with furniture layout, enlarged construction details.

Unit-3

ISOMETRIC VIEWS

Presentation of time problem; drawing quickly with basic shapes, isometric view, Adding detail to view in 3D space, use of cameras, material applications. Presenting models - to jury or clients.

Preparation of drawings and details drafted in Building construction studio in to Auto cad.

Unit-4

INTRODUCTION TO 3D MODELLING

Google Sketch Up or relevant 3D modelling software–Introduction to 3Dmodelling software interface, demonstration of 3D modelling commands required to convert 2D project into 3D.

3D massing of built forms studied in History of Architecture and Theory of Architecture

Course Outcomes:

1. Acquire necessary skills and knowledge to use the computer and digital media as a tool
2. Gain familiarity with the use of digital media for architectural representation
3. Draft and present architectural ideas through 2D CAD drawings.
4. Acquire skills to employ digital tools and techniques in three dimensional representation

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References:

1. Auto CAD 2016 tutorials SDC Publications.
2. Auto CAD for Engineers and designers by Tickoo Bhaat.
3. CAD in Civil Engineering

Fourth Semester

Architectural Design – III

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR4010	ARCHITECTURAL DESIGN - III	PC	2	2	4	9	8

COURSE OBJECTIVES:

1. To introduce the techniques and methods of a documentation study
2. To understand the urban context and its implication on a design for commercial use.
3. To explain how architectural design can foster better interaction and activity in the public realm.
4. To develop a design considering the structural factors and incorporating building services

COURSE CONTENTS

Rural Documentation: 6 to 8 weeks

Documentation study of rural architecture; Visit to site, socio-economic survey, Measured drawing, socio cultural study, activity mapping and study of street elevations, land use, infrastructure, vegetation etc. Formulation of Design proposals based on documentation study

Urban Context:4 to 5 weeks

Stage 1

Design of a building for commercial/retail use, Introduction to urban regulatory controls and barrier free design, Case studies, case study documentation and presentation, arriving at Design requirements, Site study, site analysis, concept development, zoning.

Stage 2

Design development, relating the system of horizontal and vertical circulation, concept of a service core, Resolution of structural grid, open spaces and parking design.

Stage 3

Double line plans, 3D visualization, Roof plan, roofing, massing, elevations, sections, site plan, application of rendering and presentation technique using manual/ software.

COURSE OUTCOMES:

On completion of the course the students will be able to:

1. Relate architecture to built form, climate, materials, culture and occupation in a rural or urban setting.
2. Design a space for retail/ commercial considering structural factors.
3. Apply urban regulations in project planning.
4 Use the knowledge of building services while designing a commercial or retail space.

REFERENCES:

1. Neufert, Ernst architect's data. Crosby Lock Wood and Sons
2. Time Saver Standards for Architectural Design Data. McGraw Hill.
3. Rural Documentation studio, NIAS publication.

Structural systems and building construction-IV

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR4020	STRUCTURAL SYSTEMS & BUILDING CONSTRUCTION & MATERIALS - IV	BS	4	3	1	7	7

COURSE OBJECTIVES

1. Acquaint students with alternative methods of slab for column free construction
2. Appraise the students with methods of steel construction for spanning small to medium spans and introduce RCC columns
3. Extend knowledge on various types of Foundations in RCC and their applications
4. Describe various types of RCC staircases, Plastering, waterproofing and waterproofing compounds.

CONTENTS:

UNIT I:

- Mechanical properties of Steel
- Steel trusses: Introduction to steel sections, welding and riveting. Buildings with small, medium span trusses, placing of trusses in key plan, typical sectional elevation of truss (tube and angle), details at ridge, eave, purlin fixing etc. Roof covering with GI sheets and other materials.
- Material study: Metals and Alloys: Properties, sustainable design character Architectural usage or application in construction industry. Galvanizing and Chromium plating process.
- Structural behavior of Large Span Steel trusses, lattice girder, tubular trusses and north light glazing.
- Pre Engineered Buildings, Assembling process of Pre Engineered Structures, Advantages & disadvantages of PEB's, Castellated beams. Different types its applications, advantages & disadvantages.

UNIT II :

- RCC foundation: shallow foundations– Definition, purpose, site exploration, preliminary investigation, methods, trial pits, bore holes, Bearing capacity of soil, plate load method, penetration test method, SBC based on IS code, methods to improve SBC
- Types of shallow foundations – Isolated foundation, Grillage foundation, Combined and Trapezoidal foundations , Raft foundation and types of Raft foundations, foundation for black cotton soil, pier foundation, foundation on sloping ground, , timbering of trenches, excavation for water logged sites, concrete used for foundation
- Deep foundation- Types of deep foundations, pile foundations, type of pile foundations including R.C.C and Pre cast piles, pile driving, structural implications, Caissons, types, Shoring, types of shoring, underpinning and scaffolding, types of scaffoldings, retaining walls

UNIT III

- General framing arrangement and Structural design of beams, columns, slabs and foundations for a single storey building using SP 16: Design Aids for Reinforced Concrete to IS 456:1978.
- Two way Concrete Floor and Roof Systems: Two-way Slab-Beam, and design of short columns
- Design Review: Review of design of Column, Beam and Slab, total concrete volume, calculation of reinforcement tonnage

UNIT IV

- Filler slab, various materials used in filler slab. Detailing of filler slab with various materials for a particular span. Applications of filler slabs, advantages and disadvantages of filler slabs.
- Waffle slabs- Detailing of waffle slab, applications, advantages and disadvantages.
- Structural principle behind staircase, Types of RCC staircases, reinforcements and details.

COURSE OUTCOMES:

Students will be able to

1. Acquire the knowledge of alternative slabs systems for medium to large Flat spans
2. Infer the principles and behavior of Steel structures for roofing, illustrate types of medium span trusses and attain the ability to design a single storied building in R.C.C
3. Identify different of types of Foundations and techniques of constrcution with typical details
4. Explore different types of staircase design in RCC and waterproofing materials

REFERENCES:

- STRUCTURES - Martin Bechthold, Daniel L Schodek, PHI Learning Private limited
- Building Construction Hand book, Roy Chudley and Roger Greeno, Routledge, London
- Building Construction, Sushik Kumar, Standard Publishers Distributors, New Delhi.

Climatology

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR4030	Climatology	BS	3	0	0	3	3

COURSE OBJECTIVES:

1. To discuss the impact of climate on architecture and vice versa.
2. To enumerate the different climatic zones and their influence on building materials and construction techniques.
3. To explain the concept of human thermal comfort.
4. To illustrate the design process for designing in response to climate.

COURSE CONTENTS:

UNIT I:

Introduction to Climate:

Effect of climate on man, shelter and environment.
Elements of climate, measurement and representation of climatic data.
Classification and Characteristics of tropical climates, major climatic zones of India.

Thermal Comfort:

Thermal balance of the human body. Effect of climatic elements on the thermal comfort of the environment. Psychrometric chart & Bioclimatic chart.

UNIT II:

Design process for climate response 1:

Site level: Effect of landscape elements on site/ micro climate. Landform, vegetation, water bodies, streets, open and built spaces, ground character.
Building level: Orientation with respect to sun path, plan form, solid void ratio, roof form.

UNIT III:

Design process for climate response 2:

Fenestration (Natural Ventilation, Day Lighting & Shading Devices): pattern, configuration, orientation and controls/ shading devices with emphasis on design of shading devices with respect to sun path, using solar charts.
Material finishes: Roof materials, wall materials, external colors & textures, external finishes.

UNIT IV:

Climatic Design considerations:

Design considerations for buildings in tropical climates with special reference to hot-dry, warm humid and composite climates

Literature study of relevant traditional and contemporary building examples.

COURSE OUTCOMES:

On successful completion of this course, students shall be able to:

1. Interpret the influence of climate and architecture on each other.
2. Describe thermal comfort and explain the effect of climate and architecture on human comfort.
3. Outline the design process for climatic response at various levels.
4. Analyze through case studies the design considerations for different climatic zones.

REFERENCES:

1 Koenigsberger, O H & others,

Manual of Tropical Housing & Building Climatic Design, University press

2 Shah, M G, Kal , C M & Patki, S Y

Building Drawing with an Integrated Approach to Built Environment

3 Arvind Kishan, Nick Baker, Simos Yannas & Steve Szokolay

Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings

4 Johan Van Lengen,

Barefoot Architect, A handbook for Green Building

5 Mark Dekay & G.Z. Brown,

Sun, Wind & Light: Architectural Design Strategies

6 Richard Hyde,

Climatic Responsive Design: A study of buildings in moderate & hot humid climates

Building Services –II

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR4040	BUILDING SERVICES –II (ELECTRICITY, ILLUMINATION & FIRESAFETY.	PC	2	0	0	2	2

Course objectives:

- Achieve proficiency in application of electrical services in design & construction.
- Study the current and prospective materials used in electrical services for buildings.
- Impart practical knowledge of electricity and illumination applications used in current architectural practice.
- Train the students to comprehensively plan and design the electrical and illumination requirements in building design.

Course contents:

UNIT – I

Electricity

Introduction to electrical services. Transmission and Distribution of electricity to different categories of buildings, various devices and processes involved in it. Different types of service connections. Protection systems against electrical threats to buildings.

Different types of distribution systems in buildings. Various materials involved in it. Power requirement for different categories of buildings. Preparation of electrical drawing using correct graphical

representation for a residence plan.

UNIT – II
Illumination
Quality and quantity of light; Factors influencing quality of light. Methods of lighting – Ambient, task and accent lighting. Lighting aspects for various categories like street lighting,factory lighting.
Systems of luminaries, direct, indirect, etc.
Various types of electrical lamps for different usages – incandescent, fluorescent/CFL, HID's, neon, LED lamps and their lighting characteristics, application criteria's; Design considerations for different types of occupancies and tasks and calculation of lighting requirement

UNIT – III
Safety Measures against Fire
Role of architect in providing fire safety to buildings, Fire resisting materials. Passive fire protection in different categories of buildings. Fire hazards, Fire loads. Fire precaution, Fire prevention. Provision of smoke detectors, fire alarms. Difference between **Firefighting** and **Fire prevention**

UNIT IV
Active fire protection-Extinguishers, Sprinklers, firefighting lobby etc; Systems adopted in various buildings against fire.
Case studies: Case studies of some Fire disasters and their reasons: Fire Norms by NBC, Calculation of Occupant load and min doorway width Calculation of Fire exits, Concept of Pressurization, Fire liftsand Fire Staircases regulations etc as per bye-law.

Course Outcomes:
1. Acquire knowledge on Planning and design of electrical services for simple spaces and Illustrate graphically the electrical layout plan for a simple residential building
2. Compute required illumination levels and type of lights for different tasks
3. Elaborate on Fire safety measures,methods adopted and to apply NBC norms
4. Describe various components involved in planning the Fire fighting and protection system

References:

1) H Cotton, Electrical Technology
2) L. Uppal, Electrical wiring, Estimating & Costing
3) Anwari., ElectricalEngg.
4) M.S.N. Swamy, Lighting, MSN Marketing, Bangalore.
5) Torquil Barker,Concepts in Practice lighting, 1997, B.T. Batsford Ltd, 583,fullham Road, London.
6) Dr. FrithAbnwos and others. Electrical Engineering handbook.

Housing

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR4050	**HOUSING**	PC	3	0	0	3	3

Objectives of the Course:
1. To articulate a broad overview of housing and important concepts related to description, categorization and appraisal of housing.
2. To facilitate an understanding of the concept and approach of social housing and related policies in India.
3. To facilitate an analytical approach towards study of various housing typologies, layouts for cluster planning and other guidelines towards design of housing communities.
4. To expose the students to various innovative solutions proposed by architects of national and international repute in the field of housing to tackle various issues such as social housing, disaster rehabilitation, climate sensitive housing, participatory housing etc.

Course Contents:

Unit – I

Basic concepts in housing- density, dwelling units size, household size, housing quality Importance of housing, Stakeholders in housing- users, housing agencies, policy makers Brief review of the historical development of housing in various contexts.
Housing standards for rural and urban areas
Housing stock, Housing need and Demand, housing shortage

Unit – II

Evolution of Housing policy and perspective at the national level from 1950s to present.
Brief introduction to the problem of slums in urban areas and strategies for slum up gradation
Concepts of Social housing, housing affordability, inclusiveness
Case studies of social housing from India and abroad

Unit – III

Housing design-Traditional pattern of housing design Row Housing, Cluster Housing layout of concepts, low rise verses high rise housing with examples

Relevance of Residents' Satisfaction in housing, Factors that affect residents' satisfaction in housing, psychosocial considerations, preparation of questionnaire and mock survey in different housing typologies

Unit – IV

Case studies of innovative housing projects from around the world covering concepts such as flexible/modular housing, Disaster resilient housing, innovative usage of materials, Climate sensitive housing, participatory housing etc.

Course Outcomes:

1. Demonstrate a firm grasp of housing related concepts for description and characterization of housing
2. Acquire familiarization with housing policies and the significance of social housing
3. Employ concepts learnt to arrive at design solutions in Housing
4. Acquire knowledge of modern concepts and innovative ideas to address housing issues.

Reference books:

1. Chattopadhyay Subrata, New Essays on Inclusive housing, Macmillan Publications.
2. Chiara, De Joseph, and Others. Timesavers standard for Housing and Residential development, 2" ed. McGraw Hill, Inc, New York.
3. Desai, A.R. and Pillai, Devadas. Slums and Urbanization. Popular Pra kashan Pvt. Ltd.
4. HUDCO. Housing for the Low Income. HUDCO.
5. Poulose, K. Thomas. Reading Material on Housing. Institute of Town Planners. New Delhi.

History of Architecture –IV [Islamic Architecture]

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR4060	History of Architecture-IV-Islamic Period	PC	2	2	0	3	4

COURSE OBJECTIVES

1. To articulate a broad overview of the evolution of religious architecture (Islamic) and colonial style in the Indian
2. To describe the characteristics, influences and distinguishing features of Islamic and colonial architecture
3. To facilitate an analytical approach towards study of historical buildings and styles.
4. To inculcate skills in describing historical buildings through various media such as drawing, model making, audio video documentation etc.

COURSE CONTENTS:

Detailed study & analysis of architectural styles in Islamic and colonial through significant examples; Socio-political background, Climatic & geographic influence; Construction technology & material; Design principles; Typology; Evolution; Spatial organization; Form & Detailing.

UNIT I-

- Islamic Architecture in India: Overview; Development of various building typologies & incorporation of indigenous elements, development of construction systems & elements;

- Various dynasties & their influence: Slave, Khilji, Tughlaq, Sayyid & Lodi; Significant examples for each dynasty.

UNIT II-

- Provincial Islamic Style: Development of provinces & evolution of regional architecture; Geographic, social, cultural, political influences; Significant examples for - Bengal, Gujarat, Jaunpur, Deccan (Gulbarga/Bidar/Golconda/Bijapur)
- Mughal Architecture: Development of Mughal Architecture -Geographic, social, cultural, political influences; Incorporation of local styles, skills, materials & elements; Development of Settlements, Building typologies & Gardens; Study of significant examples at Delhi, Agra, Fatehpur Sikri

UNIT III-

Documentation/ Case study of any examples of Islamic/ Colonial architecture

UNIT IV-

Colonial Architecture- British: Overview, Evolution of Indo-Saracenic style of Architecture, fusion of Indian regional architecture with European styles; Development of various typologies likeForts, Bungalows, Cantonments, Public buildings, Institution, Industries & Commercial buildings; Architectural examples from prime British settlements of Calcutta, Madras, Bombay & New Delhi.
The examples to represent the historical styles are suggestive & students are encouraged to explore additional examples for a comprehensive understanding of the respective styles

COURSE OUTCOME:

On the successful completion of this course the students shall be able to

1. Identify the general characteristics of Islamic and colonial Architecture in the Indian subcontinent
2. Explore the evolution and development of architecture styles under various dynasties/regions
3. Demonstrate an understanding of sociocultural context, climatic influences and technical advancements and construction techniques with reference to various style of architecture

4Acquire skills to describe historical buildings through various media such as sketching, audio visual presentations, model making etc.

REFERENCES:

1	Bhalla, A S	Royal Tombs of India 13th to 18th Century	Mapin
2	Sir Banister Fletcher	History of Architecture	
3	Brown Percy	Indian Architecture – Islamic period	
4	Grover Satish	Islamic Architecture in India	
5	Thomory Edith	A History of fine arts in India & the West	Orient Longman

Computer applications in Architectural Design –II

Course Code	Course Title	Course Type	L	P	D	C	Hrs/Week
B18AR4070	CAD –II	PC	2	1	0	2	3

Course Objectives:

1. To deliver the working knowledge of advanced software
2. To demonstrate building of 3D models and conceptual architectural masses
3. To Illustrate rendering of photo-realistic images
4. To develop their skills in editing and rendering of architectural drawings

Unit-1

Introduction ADVANCED TOOLS

• Follow-Me tool
• Offset
• Axis
• 3D Text
• Sandbox Tool
• Solid Tools

Unit-2

INTRODUCTION TO V-RAY

SKETCHUP & V-RAY
•Render Options
•Materials
•Texture Mapping
•Lights
•Environment Lighting
•Light and Shadow
•Reflections
•Refraction
•Transparency
•Displacement
•Caustics
•Physical Camera
•Sun and Sky
•V-Ray Sky
•Render

Unit-3

INTRODUCTION TO LUMION

- Introduction to Lumion software
- Loading of environments and importing sketch up model
- Application of materials and editing the materials
- Introduction to landscape elements and foliage
- Image rendering

  Movie rendering

UNIT-4

INTODUCTION TO PHOTOSHOP

- Tool palette and exploring options
- Importing images and editing

Composing the images

Course Outcomes:

On the successful completion of this course, the student shall be able to:

1. Explore any advanced software as a 3D modeling tool
2. Acquire skills to Convert 2D drawings into 3D drawings using advanced software.
3. Visualize the Materials & Lighting aspects of Design & create realistic renderings.
4. Explore Photoshop as a rendering tool and Acquire skills to Develop good design presentations & Compositions with the help of advanced software.

References:

1. www.sketchup.com/learn/videos

Fifth Semester – 2018 Batch

Architecture Design-IV

Course Code	Course Title	Type/Evaluation	L	P	D	C	Contact Hrs
B18AR5010	Architecture Design-IV	PC Viva	4	0	4	10	8

Studio Theme: Community living -Students shall get an understanding of increasing complexities from single dwelling to multiple dwelling units and relate to social issues in an Urban context with respect to Housing.

COURSE OBJECTIVES

1. To describe agglomerations of multiple building units in residential setting through literature and case studies for the intended context through Global and local examples.
2. Introduce and develop different Habitation types in an urban setting, implementing Building bye laws pertaining to Set backs, achieving F.A.R and Parking norms within a larger Master Plan
3. To provide an insight into modular housing units, prefabricated housing as alternatives for traditional methods.
4. To facilitate integration of building services like water supply, drainage, rainwater harvesting, uninterrupted power supply, SWD into the design.

Course Contents:

UNIT – I

Case study and literature study of selected Design type. Site selection and Site study in urban location

UNIT - II

Drawing up specific design requirements that are site specific. Zoning and Development of Form, splitting of units with Vehicular and Pedestrian circulation resolved.
Continuous emphasis on controls, codes and bye-laws.

UNIT – III

Development of drawings for detailed units (Habitation and others). Adopting norms, structural aspects (grid planning) , exploratory study on modular and prefabrication models in Housing as alternatives

UNIT -IV
Detailed Design of housing units, integration of services. Presentation and Models using computer aided software or Manual drawings.

STUDIO PROJECTS:
Indicative Projects:
Group housing with added infrastructure like clubhouse, shopping, interactive open spaces etc, Campus housing, rehabilitation housing, resort type hotels with multiple units and landscaped areas for public interaction, Serviced apartments for student housing in City Centers with added infrastructure like clubs, shopping, offices etc.

Time bound problems:
Detailing of a unit within the larger design can be taken up for this.

COURSE OUTCOMES: On completion of the course, the student shall be able to Formulate the design problem to address mass housing needs in an urban context through Fundamental knowledge of literature study, Case study, site study and Context study.

1. Characterize agglomeration of buildings in a layout and develop road networks, junctions, parking needs and common areas to arrive at the design solution
2. Demonstrate space planning principles for efficient unit plans and integrate open spaces, incorporate basic services like water supply, sanitation, rain water harvesting, electrical services and fire safety applied in the Design
3. Communicate the design using latest software tools, models or through manual drawings in the given context.

Reference books:

1. Time savers standards for architectural design data – by John Callender (Editor)
2. Architectural design data – by Ernst Neufert.
3. High-density housing for mixed income groups – Ranjana Mittal, Aneesh Nandi Copal Publishing
4. Life between Buildings- Using Public space: Jan Gehl , Island Press
5. Hotel and Resort Design- Anne M Schmid and Mar Scoviak – Lerner

STRUCTURAL SYSTEMS & BUILDING CONSTRUCTIONS MATERIALS- V

Course Code	Course Title	Type/Evaluation	L	P	D	C	Contact Hrs
B18AR5020	STRUCTURAL SYSTEMS & BUILDING CONSTRUCTION & MATERIALS - V	BS Viva	3	1	3	8	7

COURSE OBJECTIVES:
1. Explain the relevant properties of the different types of materials used in partitions, false ceilings, curtain glazing systems, along with composites and plastics as well as the different types of partitions, ceilings and curtain glazing systems presently in use. Discuss the various methods of detailing the same.
2. Describe the pros and cons of the different materials as mentioned above in terms of their practical applications in today's context, along with an insight into substitutes to conventional materials in the environmental context
3. Impart the skills to express the knowledge gained in the form of notes, sketches and drawings
4. Explain the relevant properties of the advanced forms of concrete and their applications in everyday life.
5. Recall the aesthetic guidelines conventionally used in the design and execution of shell structures and teach the students to integrate these with the knowledge of the basic principles to come up with

innovative solutions

CONTENT:

UNIT I:

Partitions:

- Single skin and Double skin partitions, full height, low height and glazed partitions
- Typical fixing details at Floor level, Ceiling level, sill level, lintel level, in respect of
- Gypsum partitions and Particle Board partitions
- Substitutes to Timber - Bamboo wood, Rubber wood, MDF, FRP, A.C.P, Laminates, Veneers.

Market study encouraged for material understanding of alternatives to Timber.

UNIT II

- **Advanced concrete** – foam concrete, ferro cement, Ferro Crete, Fiber reinforced concrete, Castrate, megacrete, thermocrete, translucent concrete, Glass fiber reinforced concrete.
- **Advanced Building Materials**: Plastic, PVC, Synthetic boards, fireproof/ resistant boards/tiles, acoustic materials, composite panels and their applications, non- load bearing gypsum blocks

Concepts may be introduced through examples and Literature studies

UNIT III:

Shells, Vaults and Domes, Folded plate structures:

- Structural principles of types of Shell structures, Vaults and Domes, Geodesic Dome with detailing and folded plate systems and details.
- Structural concepts of Tensile structures & Pneumatic structures and typical Construction details

Students may be exposed to a Hands-on workshop for installing a simple tensile structure or dome.

UNIT IV

False ceilings:

- Types of ceilings- Gypsum, Aluminium, etc. and types of framework generally used
- Typical fixing details at Partition junctions, Ceiling drops, junction with curtain glazing, external masonry
- Curtain and Structural Glazing, Types of Curtain glazing, Difference between Curtain and Structural glazing, important terminologies- Spandrel panel, Vision panel.

Learnings to be enhanced through site visits to view glazing and False ceilings types

COURSE OUTCOMES:

After completion of this course the students will be able to

. Develop an in depth understanding of the technical properties of different materials used for partitions, false ceilings and curtain glazing systems , plastics and composites including the different ways of detailing these in different applications including past practices and latest trends.

2. Summarize a comprehensive picture of the advantages and disavantages of different materials under different applications keeping in mind their environmental contribution

3. Demonstrate the knowledge gained to showcase the ability to express it using the latest techniques and tools, in the form of notes, sketches and drawings
4. Assimilate the knowledge of the properties of advanced froms of concrete to apply to everyday life
5. Apply the understanding of the basic structural principles to the historical knowledge of aesthetics in respect of shell structures,so as to formulate innovative structural solutions within the framework of codes, keeping the global context in mind, and express these solutions by means of the latest tools and techniques acquired.

TEXTBOOKS:

- Building Construction, B C Punmia 10th and 11th edition, Laxmi Publications (P) ltd, New Delhi.
- Building Construction Handbook, 10th and 11th edition Roy Chudley and Roger Greeno, Routledge, London.

REFERENCES:

- STRUCTURES - Martin Bechthold, Daniel L Schodek, PHI Learning Private limited
- Prestressed concrete by N krishnaraju Mc graw hill education
- Building Construction Hand book, Roy Chudley and Roger Greeno, Routledge, London
- Building Construction, Sushik Kumar, Standard Publishers Distributors, New Delhi
- BARRY's The Construction of Buildings (Vol. 1-5).
- BARRY's Introduction to Construction of Buildings 3rd edition, Stephen Emmitt, Christopher A Gorn.

Energy Efficiency in Buildings

Course Code	Course Title	Type	L	P		D	C	Contact Hrs
B18AR5030	Energy Efficiency in Buildings	BS Term work	1	1		0	3	3

Course objective:

1. To inform the need of energy management and conservation in building design and construction
2. To familiarize the students with passive design considerations and strategies
3. To explain the various strategies adopted to design a green building through case studies
4. To inform about the various rating systems for Green building design

Course Contents:

UNIT I

Introduction to Energy Efficiency in the contemporary context, Concept of embodied energy of material, Ecological footprint of a building, Concept of carbon neutrality, Green buildings. Direct Gain Thermal Storage of Wall and Roof, thermal properties of building materials (u value, thermal mass and time lag) - Roof Radiation Trap - Solarium - Isolated Gain-Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling – Induced Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels

UNIT II

Energy management and rating systems

Introduction to Energy Management of Buildings and Energy Audit of Buildings; Energy Conservation Building Code (ECBC). Rating systems for green building- LEED, IGBC, GRIHA etc. Case study of LEED rated buildings.

Areas for innovation in improving energy efficiency such as Photo Voltaic Cells, Battery Technology, Thermal Energy Storage, Recycled and Reusable Building materials, Nanotechnology, smart materials and the future of built environment

UNIT III

Case study:

Case study of an energy efficient building. Analyzing different techniques adopted in a building. Formulating strategies of energy efficiency.

Different software's available to analyze the energy efficiency (in design, eco-tech etc).

UNIT IV:

Application

Applying different strategies to the studio design project demonstrating with different software and analysis of findings.

Course outcome: On completion of the course, the student shall be able to

1. Outline the principles of sustainable and energy efficient building design
2. Attain an ability to apply passive design strategies in design.
3. Describe green building rating systems and their significance.
4. Apply the techniques learnt through software into design.

References:

1. "Housing climate comfort" by Martin Evans.

2. "Green Architecture"-Design for a sustainable future by Brende and Robert vale.
3. "Green Architecture"-A guide for sustainable design by Michael J Crosbie.
4. Energy efficient buildings of India, TERI

Building Services – III

Course Code	Course Title	TYPE/Evaluation		L		P	C	Contact Hrs
B18AR5040	**Building Services – III**	**BS Written exam (Tab)**		**2**	**0**	**0**	**2**	**2**

Course Objectives:

1. To Introduce mechanical ventilation and air conditioning of various types and usages
2. Describe and discuss the latest methods and materials in HVAC and understand Heating load calculations and thumb rules
3. Introduce the mechanics of Vertical and horizontal Transportation, both standard models and catering to special needs
4. Extend learnings of the services into an architectural project through case studies and design

Course Contents:

UNIT – I

Unit -1 – Heating Ventilation and Air conditioning Systems

Introduction to Mechanical ventilation & air-conditioning systems. Human Comfort and definitions, Air cycle and distribution, ducts, grilles and diffuser, Dust control and filters. Classification and application air-conditioning, Refrigeration cycle and components, Window unit, Split units without ducts, ductable splits, Package unit with ducts. Direct expansion system, Chilled water system, Humidifiers & dehumidifiers

Mechanical ventilation, air-conditioning for human comfort & definitions, Dust control and filters, Air cycle, Refrigeration cycle, components, Air distribution - ducts, grilles etc, Classification and application air-conditioning

UNIT – II

Indoor air quality, Moist air properties and Conditioning processes, thermal comfort and weather data. Heat transmission in building structures, effects of Solar radiation, Infiltration and ventilation, Heat load estimation & thumb rules, Building energy calculations and Energy efficiency compliances for HVAC.

UNIT – III

Introduction to vertical circulation, Lift well, pit, doors, car, machine room etc. Typical section through lift, quality & quantity of service, Types of lifts Lift bank, lobby and lift interiors, Hydraulic & traction lift, Escalator & travelator, Lift act, Architect's role, Double Decker lift, sky lobby, current scenario.

UNIT –IV

Design aspects and limitations involved in location and design of service core in a multi-storied building (Low and High-rise Public or commercial building). Graphical representation of advanced services for a project carried out in the previous semester may be of public or commercial building, like air conditioning details, fire escape routes, firefighting facilities like portable and non-portable systems.

Site visit recommended to a large scale mall or Hotel to understand all the services like air conditioning, vertical transportation and others.

COURSE OUTCOME: The students shall be able to

1. Acquire knowledge on Mechanical services and air conditioning systems, including

2. Analyze mechanical services required in a building and demonstrate knowledge on energy conservation techniques.

3. Describe the vertical transportation in a building.

4. Integrate & coordinate the services knowledge in architectural design to provide a service plan for a building.

References:

1. Principles of Air-conditioning by Paul Lang, D B Taraporevala Sons & company Limited
1. Building Service Engineering – by David V Chadderton, E & FN SPON – an Imprint of Chapman & Hall
2. Building Construction illustrated by Francis D K ching, CBS Publishers & Distributors
3. Building Environment – By Dr. AjithaSimha, Tata Mc-Graw Hill Publisher Co Ltd, ND
4. Mechanical System for Architects by Aly S Dadras, Mc-Graw Hill, Inc.
5. Lifts – company manuals / Brochures
6. Blue star comfort guide to air conditioning

Theory of Architecture

Course code	Course	Type/Evaluation	L	T	P	C	Contact Hrs
B18AR5050	Theory of Architecture	PC Written exam (Tab)	3	0	0	3	3

COURSE OBJECTIVES:

1. Introduce a broad overview of the evolution of thought and trends in architecture practice, across timeline
2. To acquaint the students with architectural theory from antiquity to present.
3. To equip students to apply architectural theories in order to solve real life problems
4. To familiarize students with architectural criticism and equip them with presentation skills to communicate architectural theories.

Course Contents:

UNIT I

a) Introduction to theories in form & proportions: - Theory of Proportions, Proportioning system- Golden Section, Modular, Generation of forms- Pragmatic, Analogic, Canonic and Iconic, Properties & Transformation of form.

b) Theories in Architecture- Antiquity Period- Concepts of Vitruvius

c) Theories in Architecture- Renaissance Period- Leon Alberti, Andrea Palladio, French Academic Tradition

UNIT II

d) Theories in Architecture- 18th and 19th Century Theory: Ideas of Laugier, Boullee, Ledoux, Quatramere de Quincy and Gottfried Semper.

e) Modern Movement- The principles and philosophy of modernism, structuralism in architecture ; Philosophy & theories of Louis Sullivan, Walter Gropius, Alvar Alto, Le Corbusier

Elective Study- Pablo Picasso, Immanuel Kant, Friedrich Nietzsche, Max Weber.

UNIT III

f) Post Modern Theories and Deconstruction: Ideas on Post-Modern Classicism by Robert Venturi and Charles Jencks. Fundamental beliefs and philosophy of de – constructivism, Ideas of Peter Eisemann

g) Biomimicry/biomimetics: The principles, philosophy and Examples. Discussions on Works /Philosophies of Antoni Gaudi, Norman Foster, Michael Pawlyn.

Elective Study- Jacques Derrida, Peter Eisenman, Bernard Tschumi, Henri LeFebvre, Merleau-Ponty, Juhani Pallasmaa,

UNIT IV

h) Theories on Design process in Architecture- Kenneth Frampton, Christopher Alexander, Amos Rapoport and Geoffrey Broadbent.

i) Architectural Criticism: Meaning and Definition of criticism, Types of Criticism, Wayne Attoe, John Lang – Positive and Normative Theories in Architecture.

Note- Elective study themes have been mentioned to facilitate group discussions and seminars.

COURSE OUTCOMES : On completion of the course, students shall be able to:

1. Acquire knowledge of theories of architecture from antiquity to the contemporary period
2. Identify the process behind formulation of design process, creative thinking and aesthetics in architecture

3. Analyze architectural theories and their applications towards providing innovative solutions for real life problems

4. Develop skills in critical appraisal and communication of architectural theories

REFERENCES:

1. Ching, F.D.K. (1979). Architecture – Form, Space and Order. Van Nostrand Reinhold Company.
2. Deleuze, G. and Hand, S. (1988). Foucault. Minneapolis : University of Minnesota Press.
3. Eisenman, P. (1999). Diagram Diaries. New York : Universe.

4. Heidegger, M. (1993). Building Dwelling Thinking. Basic Writings. HarperCollins. Johnson, P. and Wigley, M. (1988). Deconstructivist Architecture. New York : Museum of Modern Art.
5. Lefebvre, H. (1991). The production of space. Oxford: Cambridge.
6. Merleau-Ponty, M., and InEdie, J.M. (1964). The primacy of perception. North Western University Press.
7. Pallasmaa, J. (2005). The eyes of the skin: Architecture and the senses. Chichester : Wiley-Academy.
8. Pawlyn, M. (2011). Bio-mimicry in Architecture. London : RIBA Publishing.
9. Tschumi, B. (1994). Architecture and disjunction. Cambridge, Massachusetts : MIT
10. Venturi, R. (1966). Complexity and Contradiction in Architecture. New York : The Museum of Modern Art.
11. Vitruvius, P. and Morgan, M. H. (1960). Vitruvius: The ten books on architecture. New York : Dover Publications.

History of Architecture- V: CONTEMPORARY PERIOD

Course code	Course	Type/ Evaluation	L	P	D	C	Hrs
B18AR5060	History of Architecture- V: Contemporary Architecture	PC VIVA	3	0	0	3	3

COURSE OBJECTIVES

1. Describe through examples the emergence of Modernism in Europe and America
2. Provide an overview and understanding of Contemporary Architecture in Indian and World Architecture through the works of outstanding architects
3. Discuss developments in the West in terms of styles and movements and their influence on India
4. Trace the development in Architecture through the period of Modernism to Postmodernism upto the period of Deconstructivism

UNIT 1

World Architecture- Early 20th Century

Arts &Crafts Movement- William Morris(Red House), Art Nouveau- Works of Victor Horta & Otto Wagner, Introduction to Art Deco, De Stijl movement. Chicago School of thought; Development of skyscraper–works of Louis Sullivan. Organic architecture –Frank Lloyd Wright (Falling Waters, Prairie School) Expressionism-Gaudi (Casa Mila, Sagrada familia)

World Architecture-Late 20th Century

Modernist Architecture- works of Richard Meier (Smith House, Connecticut and Getty Centre, Los Angeles) , Le Corbusier (Villa Savoye, Unite D'habitation & Ronchamp Chapel), Mies Van der Rohe (Barcelona Pavilion, Seagram Building)

UNIT-2

Architecture in India -Post Independence and advent of Modernism

An Introduction to Indian Architectural scene during the time of Independence. Planning of New Delhi. Necessity to create different Building typologies like Industry, Institutions, offices, Mass Housing. Understanding the need for an Indian Identity and the new Modernism. Introduction to the need for designing New Capital Cities; Nehruvian theories, Chandigarh Capitol complex and other Planned Cities.

Selected works of Architects like Habib Rehman, Otto Koeingsberger, Piloo Modi, JA Stein, Le Corbusier, Louis I Kahn, Achyut Kanvinde, Geoffrey Bawa, and many more.

UNIT-3

Post-Modernism in the West- Its characteristics and influence on the rest of the world. Rejection of the idea of Modernism and embracing classicism in a new form. Early ideas of De-constructivism by Peter Eisenham, Jacques Derrida, Bernard Tschumi and its influence on World architecture. Rejection of Fundamental ideologies like Functionalism and structural rationalism. Characterised by Juxtaposition, Non-rectilinear shapes, and manipulation of surfaces.

Selected works of Micahel Graves, Robert Venturi, Charles Moore, Philip Johnson and early works of Frank O Gehry

Contemporary architecture of the West- Eero Sarinen (TWA Terminal, Gateway Arch , St. Louis), I M pei(Louvre, Paris), Norman Foster (HongKong Shanghai Bank and Renault Distribution Centre, Swindon, England)

UNIT-4

Post-Modernism In India- Trends in Indian architecture like Regionalism, Monumentality, New-Age Religious architecture, Experimental buildings, Neo-traditionalist, Neo-Vernacular styles.

Selected works of Charles Correa, Raj Rewal, Achyut Kanvinde, B.V Doshi, Uttam Jain, Laurie Baker and Anant Raje who's works can be categorized into the above styles.

Late Deconstructivism of the West- Selected works of Daniel Libeskind, Zaha Hadid, Frank Gehry

COURSE OUTCOMES: On completion of the course, students shall be able to:

1. Review through examples the emergence of modernism in Europe and America

2. Interpret the evolution of Contemporary Architecture in Indian and World Architecture through the works of outstanding architects

3 Describe green building rating systems and their significance.

4. Apply the techniques learnt through software into design.

REFERENCES

1. A concise History of Modern Architecture in India/Jon Lang Permanent Black

2. Architecture Guide-Delhi/ Anupam Bansal/Malini Kochupillai Adom

3. Chandigarh Revealed-Le Corbusier's city today/ Shaun Fynn Mapin

4. Venturi, R. (1966). Complexity and Contradiction in Architecture. New York : The Museum of Modern Art.

4. An emancipated place, a unique collection of essays presenting the contemporary works of women architects in South Asia/Brinda Somaya and Urvashi Mehta

5. Modern, postmodern architecture & Pioneer architects/ VVLN Murthy

6. Architecture of Auroville/ Anupama Kundoo and Poppo pingel

7. Modern Architecture – A Critical History/ Kenneth Frampton

VI SEMESTER

Architecture Design-V

Course Code	Course Title	e/Evaluation	L	P	D	C	Hrs
B18AR6010	**Architecture Design-V**	PC Viva	3	1	4	10	8

Course Objectives

- To outline the design principles of large scale projects preferably on chosen sites with contoured terrain
- To Illustrate that designs must respond to climate, environment and ecological factors.
- To Integrate master plan with landscape details, circulation and services.
- To facilitate the use of contemporary presentation techniques and tools to deliver the design

Course Contents:

UNIT -I

Projects shall be large scale with multiple functions and complexity. Design emphasis shall be on response to climate, environment and ecological factors. Understanding, exploration & development of design programme concept and drawing up the detailed design requirements with focus on climate, environment and ecological factors. The literature study and case studies are part of this phase.

UNIT -II

The design issues to be addressed for the design project pertaining to larger projects are
Issues in Preparation of Master Plan for the project undertaken.

Phases of development and scope for expansion.
Comfortable Vehicular and pedestrian movement.
Landscaping and Services.
Details pertaining to universal design

UNIT –III
Identify hierarchy of spaces, public and private scales of space. To continually ensure that the design is sensitive to climate, environment, and ecology. Detailing of a common major block or a public space of larger project. Integrate usage of materials, construction technique, structural system.
UNIT –IV
Exploration, analysis, integration of services, detailed design of units within the larger project in response to environmental aspects. Special focus on presentation using software.

Indicative projects: Large scale Institutional Design(Campus Planning) / Commercial / Industrial / Housing / Public use project of diversified activities with focus on horizontal & / or vertical circulation & grid planning. Site extent: Upto 20000 m2.

Course Outcomes:
On completion of the course the student shall be able to:
1. Extrapolate Contour analysis , context study, Climate responsiveness, regulations and universal design principles into formulating the project brief
2. Demonstrate an ability for space planning and develop detailing of individual blocks while integrating with the Masterplan development
3. Extend the knowledge of all the services like water supply and sanitation, Electrical, HVAC, Firesafety and acoustics to be incorporated in design.
4. Apply the knowledge of contemporary software presentation tools to the delivery of the design

References:

1. Time Saver Standards for building Types- Joseph De Chiara & John Callender
2. Time Saver Standards for Architectural Design Data-John Hancock Callender
3. Neuferts's Standards
4. Hotel and Resort Design- Anne M Schmid and Mar Scoviak– Lerner

STRUCTURAL SYSTEMS & BUILDING CONSTRUCTION –VI

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR6020	STRUCTURAL SYSTEMS & BUILDING CONSTRUCTION & MATERIALS - VI	BS Viva	3	1	1	5	5

COURSE OBJECTIVES:
1. Explain the relevant properties of the different types of materials used in partitions, false ceilings, curtain glazing systems, along with composites and plastics as well as the different types of partitions, ceilings and curtain glazing systems presently in use. Discuss the various methods of detailing the same.
2. Describe the pros and cons of the different materials as mentioned above in terms of their practical applications in today's context, along with an insight into substitutes to conventional materials in the environmental context
3. Impart the skills to express the knowledge gained in the form of notes, sketches and drawings

4. Explain the relevant properties of the advanced forms of concrete and their applications in everyday life.
5. Recall the aesthetic guidelines conventionally used in the design and execution of shell structures and teach the students to integrate these with the knowledge of the basic principles to come up with innovative solutions

CONTENT:

UNIT I

- Introduction to earthquake resistant structures, types of waves, earthquake zones according to IS code.
- Causes of earthquakes, seismic waves, magnitude, intensity, characteristics of strong earthquake ground motions.

UNIT II

- Introduction to tall buildings, development & uses. Load calculations for different structural elements – Load distribution methods – Code recommendations.
- Loads & forces on buildings. Vertical forces, Horizontal forces, internal force
- Material study: Metals and Alloys: Properties, sustainable design character Architectural usage or application in construction industry. Galvanizing and Chromium plating process.

UNIT III

- Structural behavior of Large Span Steel trusses, lattice girder, tubular trusses and north light glazing, space frames, and self-supported roofing systems
- Pre-Engineered Buildings in steel, assembling process of Pre-Engineered Structures, Advantages & disadvantages of PEB's, Castellated beams. Different types, applications, advantages & disadvantages.

UNIT IV

- Basic concepts of Prestressed concrete, prestressing materials and pre tensioning and post tensioning
- Behavior of prestressed concrete beams, columns, footings, slabs, Introduction to precast and assembling of pre- cast members. Adopting of precast members in bridges and modular building units, typical Construction details.
- Purpose and functions of joints in Building construction, types of joints that occur in Buildings. Expansion joints in Brick walls and R.C.C. framed structures and its construction details and materials involved in the construction. Study of relevant IS codes
- Advanced construction methods: Concept of mivan constructions RCC, lift slab construction, multi-storied building frames, circular slabs and beams, uses of rapid-hardening cement, ready mix concrete, light weight concrete and translucent concrete.

COURSE OUTCOMES:

After the completion of course the students shall able to

1. Develop an in depth understanding of the technical properties of different materials used for partitions, false ceilings and curtain glazing systems , plastics and composites including the different ways of detailing these in different applications including past practices and latest trends.
2. Summarize a comprehensive picture of the advantages and disavantages of different materials under different applications keeping in mind their environmental contribution
3. Demonstrate the knowledge gained to showcase the ability to express it using the latest techniques and tools, in the form of notes, sketches and drawings
4. Assimilate the knowledge of the properties of advanced froms of concrete to apply to everyday life

5. Apply the understanding of the basic structural principles to the historical knowledge of aesthetics in respect of shell structures,so as to formulate innovative structural solutions within the framework of codes, keeping the global context in mind, and express these solutions by means of the latest tools and techniques acquired.

References:

- Krishna Raju N " structural design and drawing" (RCC & steel).
- Dongre A P "Structural engineering for architects".
- Pankaj Agarwal, Manish shrikhande" Earthquake resistant structures".
- David J dowrick" Earthquake resistant design"

WORKING DRAWINGS

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
3	B18AR6030	PC Term work	2	1	0	3	5

COURSE OBJECTIVES:

The objectives of this course are:

1. To make the students familiar with the concept of working drawing
2. To expose the students to examples of good working drawings
3. To acquaint them with the knowledge required for converting a design into working drawings
4. To impart them the necessary skills for the preparation of working drawings of a project

COURSE CONTENTS

Unit 1: Basic Working Drawings

Prepare working drawings of a Design project consisting of the following:

- Setting out plans
- Site plan
- Cluster plans
- Unit plans
- Sections & Elevations

Unit 2: Detailed Working Drawings

- Toilet Details

- Kitchen Details
- Staircase Details
- Joinery Details

Unit 3: Detailed Working Drawings

- Wall Sections including details at Plinth level, Openings, Intermediate slab level and Terracelevel

Unit 4: Detailed Working Drawings

- Terrace plan including Lift Machine room, Staircase room, roof slopes
- Wall Section through Lift Machine room
- Electrical drgs
- Plumbing drgs
- Roof plan including roof drainage, stair room plan.

COURSE OUTCOMES:

On the successful completion of this course, the student shall be able to:

1. Acquire a grasp of the working drawings process
2. Obtain exposure to good standard of working drawings
3. Master the knowledge required to convert their designs into working drawings
4. Acquire the necessary skills required to prepare a complete set of working drawings

REFERENCES:

- Building Construction" by W.B Mckay
- Building Construction" by Punmia
- Text Book of Building Construction" By Arora & Bhindra

Building Services-IV (Acoustics)

Course Code	Course Title	Type/ Evaluation	L	P	D	C	Hrs
B18AR6040	**Building Services-IV (Acoustics)**	BS Written exam (tab)	2	1	0	2	3

Course objective:

1. Describe the properties and characteristics of Sound and outline the science of Acoustics
2. Explain acoustical principles of Open-Air Theatres and auditoriums in History
3. Extend knowledge on Calculations and formulae required in Acoustical Design and elaborateon Methods of Achieving Noise control – Natural and Manmade.
4. Illustrate Methods and Materials in Acoustical Insulation.

Course Contents:

UNIT I

Introduction to architectural Acoustics - Characteristics and measurements of sound, frequency,intensity, decibel scale, effect of sound on man - design criteria of sound for various architectural spaces, acoustical problems. History behind Theatres and amphitheaters.

UNIT II

Acoustics in built environment - Behavior of sound in enclosed spaces, reverberation and reverberation time, Sabine's formula and its interpretation, dead and live rooms, sound field ofclassrooms, offices and studios.

Auditorium acoustics - design criteria

UNIT III

Noise Control - Classification of Noise, Environmental impact of noise and acceptable noise levels.Principles of noise control - noise sources, airborne and structure borne sound.

Vibration isolation - damping of noise, noise barriers, noise transmission through ducts, Design criteria for industrial noise control, planning considerations, use of unit absorbers, treatment of floor & wall

UNIT IV

Acoustic materials and applications

General description on properties of acoustical materials – tile, boards, fibers, carpets, resonator absorbers, unit absorbers, composite materials and acoustic plaster, panel absorbers.

Construction details of acoustic treatment on walls, ceiling and floors, floating floor construction acoustic panels and screens, maintenance of acoustic treatment.

Course Outcome:

On completion of the course the student will be able to:

1. Define the properties and characteristics of Sound and elaborate on the working principles,techniques and technology involved in open air theatres and auditoriums of the historical background.
2. Identify the need of acoustical treatment at various places for absorption, reflection and diffusion and acquire the formulae and calculations required in Acoustical Design to controlfeasible environment.
3. Adapt the methods of Achieving Noise control by using both Natural and Manmade materials and techniques and exploring innovative/futuristic technology based or sustainablesolutions, as well as by understanding the aesthetic part of the material.
4. Analyse and Apply Methods by considering any real life Acoustical treated typologybuilding and evaluate and submit report and design with different NRC formulas by considering the study and research underwent in the course.

References:

1. “Architectural Acoustics Principles and Design”By David R. Johnson and Madan L. Mehta.
2. “Auditorium Acoustics and Architectural Design”By Michael Barron.
3. “McDavid Egan (1988)-Architectural Acoustics” McGraw hill book co., NY.
4. Parich, Peter (1979) Acoustics: Noise and Buildings, Faber and Faber, London

Architectural Research Writing

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR6051	**Architectural Research Writing**	**PE Viva**	**3**	**0**	**0**	**3**	**3**

Course Objectives:

1. To expose the students to basic research methods in architecture
2. To facilitate the selection, formulation and conduct of a small research exercise relatedto architecture
3. To familiarize students with basics of data collection and analysis through team work
4. To cultivate communication skills required to communicate the research outcomes inform of research paper, audio visual/verbal presentations.

COURSE

CONTENTUNIT 1
Meaning of research, objectives of research, types of research, research approaches, significance of research, research process, criteria of a good research, problems in research
Defining the research problem-Title, aim, objectives, scope, limitations, need for study, Preparation of research abstract

UNIT 2
Basics of literature survey and referencing styles, Research strategies in architecture historical, qualitative, co relational, experimental, simulation, logical argumentation, case studies and combined strategies, secondary case studies and analysis
Formulation of research methodology, literature survey, Secondary case studies, identification of Primary case study

UNIT 3
Primary case study, data collection, analysis. Formulation of research conclusions based on Primary and secondary studies.
Preliminary draft of the paper.

UNIT 4
Presenting a seminar on the selected topic. Paper to be written on a selected topic.

COURSE OUTCOMES
On the successful completion of this course the students shall be able to
1. Demonstrate an understanding of research methods in architecture
2. Exhibit analytical reasoning and critical thinking skills to explore the realms of their selectedresearch topics
3. Acquire the ability to collect, assimilate and analyse data collected through primary and secondary survey techniques through teamwork
4. Acquire skills in academic writing and presentation to communicate the research outcomes to a wider platform

Reference books:

- C R Kothari, Gaurav Garg, Research Methodology: methods and Techniques, New ageInternational Publishers, 2014

- Groat, Linda N., and David Wang. Architectural research methods. John Wiley & Sons, 2013.

Digital Architecture

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hours
B18AR6052	**Digital architecture**	**PE Viva**	**3**	**0**	**0**	**3**	**3**

Course Objectives:

1. To sensitize students in digital technology and architecture
2. To orient the students towards contemporary process in architectural design
3. To impart concepts of geometries and surface, media and architecture
4. To familiarize students with Fractal geometries and their applications in architecture

COURSE

CONTENTUNIT 1

INTRODUCTION

Investigation of contemporary theories of media and their influence on the perception of space and architecture.Technology and Art –Technology and Architecture –Technology asRhetoric –Digital Technology and Architecture

UNIT II

ASPECT OF DIGITAL ARCHITECTURE

Aspects of Digital Architecture –Design and Computation –Difference between Digital Process and Non-Digital Process –Architecture and Cyber Space –Qualities of the new space –Issues of Aesthetics and Authorship of Design –Increased Automation and its influence onArchitectural Form and Space

UNIT III

CONTEMPORARY PROCESS

Overview of various Contemporary design process and it relation to computation: Diagrams –Diagrammatic Reasoning –Diagrams and Design Process –Animation and Design –Digital Hybrid Design Protocols –Concept of Emergence -Introduction to Cellular Automata and Architectural applications –Genetic algorithms and Design Computation

UNIT IV

GEOMETRIES AND SURFACES

Fractal Geometry and their properties –Architectural applications -Works of Zevi Hecker–-Shape Grammar -Shapes, rules and Label -Shape Grammar as analytical and synthetic tools-Combining Shape grammar and Genetic algorithm to optimise architectural solutions -HyperSurface–Introduction to Hyper surface and concepts of Liquid architecture.

COURSE OUTCOMES

On completion of the course, students shall be able to:

1. Comprehend the relationship between digital technology, media and architecture
2. Acquire knowledge about various aspects of the digital architecture process
3. Infer the contemporary design processes and their relation with computation
4. Acquire skills to approach spatial design problems with help of diagrams, geometry andsurface parameters.

References

1. The Phaidon Atlas of Contemporary World Architecture, 2008
2. Dennis Sharp Twentieth Century Architecture –A visual History, Images Publishing 2006
3. Dimitris Kottas, Contemporary Digital Architecture: Design and Techniques, Links International, 2010
4. Antoine Picon, Digital Culture in Architecture, Birkhäuser Architecture, 2010
5. Nick Dunn,Digital Fabrication in Architecture, Laurence King Publishing, 2012
6. Rivka Oxman, and Robert Oxman,Theories of the Digital in Architecture, Routledge, 2014
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Urban Planning

Course Code	Course Title	TYPE/Evaluation	L	P	D	C	Hrs
B18AR6060	**Urban Planning**	PC Written Exam (Tab)	3	0	0	3	3

Course Objectives:

1. To provide an overview on the planning methodologies adopted by the ancient civilizations upuntil the concept of New Towns.
2. To elaborate on the importance of planning principles and to describe various aspects in planning like Land use, Infrastructure, Transportation, Housing, and integrating them at a Town or City level.
3. To give an overview of the Process of Planning and the implementation mechanism.
4. To Discuss strategies and implementation mechanisms for Cities of the Future

Course Contents:

UNIT I:

History of Town Planning - Ancient town patterns, Impact of industrialization and technology, Evolution of modern town planning concepts, their Characteristics and classification. Model towns, garden cities, satellite towns, suburbia, green belts. Case studies of New Towns.

UNIT II

Planning Principles- National planning, regional planning, and town planning
Principles of land use planning, Principles of environmental planning control of land, water and air pollution, building byelaws and importance in planning,
Planning for Environmental conservation- Ekistics units and grids.

UNIT III

Planning Process and Implementation - Process of preparation of Master plans and developments and development plans - structure plans. Causes for urban blight-remedial planning measures. Housing- concept of L.I.G/ H.I.G and slum clearance boards.

UNIT IV

Planning For Future - Urban Renewal, Re- Planning, Urban Conservation, Concept of Decentralization and Recentralization, Resilient Cities, Smart cities and Transit Oriented development in Cities

Case studies to be discussed from the above approaches for the future of cities

Course Outcomes:

1) Describe different planning principles of ancient towns and early models of planning new towns
2) Discuss Land Use planning, understand roles of planning authorities and different levels of Planning.
3) Elaborate on the Planning process and its implementation and recognize relevant issuesaffecting Planning in Urban scenario
4) Identify planning methods and solutions for future cities through case studies.

References:

1. "The urban pattern" Arthur Gallion
2. "Garden cities of Tomorrow" Ebenezer Howard
3. "Design of cities" Edmund Bacon
4. "An Introduction to Town and Country Planning", John Ratcliffe, Hutchinson 1981
5. Urban Planning- theory and practice, Pratap Rao, CBS Publishers.
6. Urban Planning- Anthony J. Catanese, James C. Snyder. McGraw Hill.

Architecture Design-VI

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR7010	**Architecture Design-VI**	PC Viva	3	0	6	12	9

Studio Theme: Services & Structures for complex building typologies

Course Objectives

To brief on various parameters of context including site, history, culture, tradition, Climate etc.

1. Identify the design approach at the start of the project, for e.g. sustainable design, Energy EfficientDesign, Structural, or any other.
2. Interpret the un-built environment of Landscape and apply knowledge of Place making in planningthe Public spaces as required.
3. Demonstrate abilities to resolve large projects of higher complexities with integration of knowledgegained in Construction, Structures, Landscape, Services, Bye laws and codes.

Course Contents:

UNIT – I

Literature Study and Case Study

Identifying a suitable case study in the City which fits the project brief and doing the study. May be broken up into different components to facilitate group work. Individual Literature studies from available Internet sources and Books to be done.

Site Selection, analysis and Concept development.

UNIT – II

Development of Design

Design developments through study Models, Plans, Sections, area analysis, Mapping with City Bye law's and Zoning. Resolving Vertical services, Firefighting, HVAC and structural systems. Continuous emphasis on controls, codes and bye-laws.

UNIT – III

Delivery of the Design

Detailed double line Plans, elevations, Sections and models using computer aided software or Manual drawings.

UNIT -IV

Time Problem - Detailed Design of taking one component for ancillary block/ Open space - e.g. Cafetaria, Out patient Unit,Public plaza etc..

STUDIO PROJECTS:

Major Project:

Complex building typologies such as mixed use development, Hospitals, 5 star hotel & convention centre , high rise office buildings etc may be taken up as problem statements. The project should have sufficient scope for integration of large span structural systems and services such as plumbings and sanitation, vertical circulation, HVAC, electrical services and Acoustics.

Time bound problems:

Detailing of a unit within the larger design can be taken up for this.

For eg: Interior design of Out -Patient Unit in a hospital;Office cafeteria design with detailed kitchen services and spill out spaces; Public plaza and recreation centre in a mixed use development.

Course Outcome: On completion of the course, students shall be able to

1. Explore the possibilities in contextual design through context reading
2. Relate the Design with Sustainability, Energy Efficiency, Structure competency etc.
3. Elaborate Space Planning for un-built environment of Landscape and public spaces
4. Explore the advanced architectural design by including building services and other addedinfrastructure

Reference books:

1. Time savers standards for architectural design data – by John Callender (Editor)
2. Architectural design data – by Ernst Neufert.

Estimation and Costing

Course Code	Course Title	TYPE	L	P	D	Total	Contact Hrs
B18AR7020	Estimation and Costing	BS	3	0	0	3	3

Course Objectives:

1. To provide the student sufficient knowledge of estimation in order that he can advise prospective clients on project viability and monitor/ control project cost.
2. To provide the student adequate knowledge to write the specifications for a given item of work, to work out the unit cost of individual items based on their specifications and arrive at the overall cost of the project.
3. To enable the student to write specifications for diverse items of civil works with a view of controlling quality of work executed at site.
4. To enable students to prepare entire estimation of one project.

UNIT 1

INTRODUCTION TO ESTIMATION

Estimation– definition; purpose; types of estimate; various methods of approximate estimate of buildings study of various drawing with estimate, abstract method of taking out quantities and cost-center line method, long wall and short method or crossing method.

UNIT 2

RATE ANALYSIS

Rate analysis– definition; method of preparation; quantity and labor estimate for unit work; task or outturn work; rate analysis for: earth work, concrete works, first class brick work, cement plastering, DPC with cement mortar/ concrete, finishing (cement paint, distemper, acrylic emulsion, enamel paint) to walls & ceiling.

UNIT 3

INTRODUCTION TO SPECIFICATION
Specification- Definition, purpose, procedure for writing specifications for calling tenders, typesof specification. General specifications for 1st, 2nd, 3rd and 4th class buildings.

SPECIFICATION FOR DIFFERENT ITEMS
Specifications for the following items – Bricks; sand; cement; coarse aggregate; water; reinforcement; Earth work in foundation; PCC; RCC; First class brick work in cement mortar; half brick thick partition in cement mortar; DPC; glazed tiles in skirting and dado, cement plaster; joinery in wood, steel & aluminum; painting to walls – cement paint, oil bound distemper, acrylic emulsion, enamel paint; painting to joinery; varnishing; French polishing

UNIT 4

DETAILED ESTIMATE
Detailed estimate– data required, factors to be considered, methodology of preparation, abstract of estimate, contingencies, work-charged establishment, bill of quantities, different methods for estimating building works, methods of measurement of works.

COURSE OUTCOME
The student shall be able to enumerate the detailed list of items for preparation of an estimate for a simple building.

1. Derive detailed specifications for items enumerated for construction.
2. Compute the rate analysis for simple residential buildings.
3. To prepare complete estimation of load bearing/ frame structure.

References:

Professional Practice

Course Code	Course Title	YPE/EVALUATION	L	P	D	To tal	Cont act Hrs
B18AR7030	**Professional Practice**	PA SEE (Tab Based)	3	0	0	3	3

Course Objectives: Students are introduced to:

1. Outline the Professional responsibilities within the ambit of the laws of the land, buildingcodes, contract documents and ethics.

2. Describe the different aspects of contracts, tenders and project management

3. Introduce the different aspects of running an Architectural practice/office.

4 Orient to the legal aspects, legislation having a direct impact on Architectural practice andalso the current trends in practice

Course Contents:

UNIT I:
Introduction to Profession Practice-Idea of profession and essential differences among profession, trade and business. Profession of Architecture-Types and extent of services offered by architects, scale of fees, stages of payment, and contract between client and architect. Code of Professional

Conduct-Council of Architecture's guidelines on competitions, types and classifications of competitions. Building Industry-Overview of the industry, Finance, statutory controls, constructionprocedures and enforcement issues related to building industry and the role of architect, employer, and contractor.

UNIT II:

Architectural Practice1- Types of Architectural firms, proprietorship, partnership, associate ship.

Architectural Practice-2: Various means of building client base and gaining projects.

Tender1& 2 - Procedure of calling for tender, documents necessary, Types of tenders, process of

selection and award. Architect's role in tender process, Earnest Money Deposit, Security Deposit, Retention Amount, Mobilization Amount and Bonus & Penalty Clauses.

UNIT III:

Introduction to Contract Administration & Issues of Contract- Bill checking, quality auditing, handover procedures and final certification. Termination of contract, Certificates of value and quality, Defects liability period, Liquidated and un-liquidated damages, Extension of time, delays andpenalty, Non tendered items, additional works, variations, rate analysis and architect's role in certification of variations, Types of insurance necessary during contract including fire insurance for safeguarding client's interest. Project formulation - BOT, DBOT, BOLT, BOO. Understand the process - Expression of Interest, Request for proposal, Mode of evaluation, evaluation of Bid, Award of work. Site Supervision, meeting, co-ordination, instructions etc.

UNIT IV:

Architect's liability, Legislations and current Trends- Liabilities - Safeguards in construction industry such as performance bonds, insurance warranties, retention, indemnities, and estoppels and liquidated damages. Legislations - DCR, Factories acts, Heritage Act, TDR, Barrier free environment, CRZ and others

Course Outcome:

On completion of the course the student will be able to:

1.Describe the various aspects of Architectural Practice such as the types of services offered, the scaleof fees and stages of payment, types of Architectural firms, types of tenders etc.

3.Outline the guiding principles of Professional Practice, including Professional

ethics.3.Acquire the knowledge on process of architectural practice.

4.Acquire knowledge on architect's liabilities, legal aspects and current trends in practice

.Reference Books:

1. "Professional Practice for Architects & Engineers" By Roshan Namavathi
2. "Legal and Contractual Procedures for Architects" By Bob Greenstreet
3. "Professional Practice" by KG Krishnamurthy and SV Ravindra

Interior Design

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR7041	**Interior Design**	PE Viva	3	0	0	3	3

Course Objectives:

1. To familiarize the students with an overview of interior and furniture design and designmovements through history.
2. To inform the various components of interior space and treatment and finishes for thesame.
3. To enable students to design an interior project applying all knowledge gained.
4. To illustrate graphically the interior design through plan, sections, elevations and 3Dviews by using software's

Course Contents:

UNIT – I

History and Introduction - Definition and process of interior design - vocabulary of interior design in terms of principles and elements. Understanding interior spaces using activity analysis and anthropometrics. Effect of enclosure, fenestration, color, lighting on perception of interior space. Psychological effects of space.

Designing for Comfort- natural and artificial lighting, air conditioning and acoustics.

UNIT – II

Components of Interior Spaces

Interior Treatment and Finishes: floors, ceilings, walls, partitions, window treatments, accessories

Furniture Design: Importance of furniture, Ergonomics, Materials, matching Furniture to Themes.

Furniture for specific types of interiors: office furniture, children's furniture, residential furniture.

UNIT – III

Integration into Design - Interior lighting - types of lighting fixtures, Interior landscaping elements: rocks, plants, water, flowers, fountains, paving, artefacts, etc., their physical properties and effects on spaces

Integrating Services into Interior Design: Water supply and drainage, Electrical, Air-conditioning.

UNIT IV

Design of Interiors (Office, Restaurant, Hotel etc.,) - Drawing Plan, Sections, Elevations specifying Materials, methods of construction, detailing showing furniture Layout etc. Should be represented using Manual or Digital software.

Course outcomes:

On completion of the course the student will be able to:

1. Characterize the guiding principles of Interior Design.
2. Enumerate the different components of Interior Design
3. Articulate the integration of lighting, services and landscaping into Interior
4. Enumerate the latest finishes and products available in the field of Interior Design and integrate all the above into the final outcome in the form of drawings.

References:

1. "Construction and Detailing for Interior Design" By Drew Plunket
2. " Interior Architecture From Brief to Build" By Jennifer Hudson
3. " Key Interiors Since 1900" By Graeme Brooker

4. “Time Saver’s Standards for Interior Design”, Joseph DeChiara, Julius Panero, Martin Zelnik,McGraw-Hill Professional 2001
5. “Interior Design”, John F.Pile, John Wiley and Sons 2004
6. “The Impulse to adorn - Studies in traditional Indian Architecture”, Dr.Saranya Doshi, Editor,Marg Publications 1982
7. “Introduction to Interior Design”, Steport - De - Van Kness, Logan and Szebely, Macmillan Publishing Co NY 1980.
8. “ Human Dimensions and Interior space”, Julius Penero and Martin Zelnik, Whitney Libraryof Design NY 1979

GRAPHIC DESIGN

Course Code	Course Title	TYPE/Evaluation	L	P	D	C	Hrs
B18AR7042	**Graphic Design**	PE Viva	3	0	0	3	3

COURSE OBJECTIVES

1. To introduce to the basics of graphic design
2. To introduce to the tools of graphic design
3. To introduce to the importance of computer graphics through software’s and typography design
4. To introduce to the different fields of graphic design

Unit 1: Introduction to Graphic Design
This module will cover the history of graphic design, uncover what graphic designers do and review the design process.

- ·Course Introduction
- ·Historical Overview of Graphic Design
- ·What Do Graphic Designers Actually Do?
- ·Design Process

Unit 2: Elements of Design
This module will introduce the design principles of balance, alignment, proximity, space, repetition and contrast.

- ·Overview of Design Principles
- ·Balance and Alignment
- ·Proximity and Space
- ·Repetition and Consistency
- ·Contrast and Color

Unit 3: Basic Concepts of Design and textural elements of design: fonts, typography and spacing
This module will go over the expectations of projects in this specialization, how to apply the design principles to the projects, and software needed to product course projects.

- ·Online and Adobe Products Overview and Uses
- ·From the history of typography, the difference between type, fonts and text as well as exposure to typography spacing, students will learn the value of selecting the best kind of type and combinations of fonts to get their message across in a visually pleasing manner.

Unit 4: Print and digital elements of design: Branding and User Experience
In this module the students will be introduced to the print and digital media

- · Textual and color elements, as well as tips on fixing design issues.
- · Printing terms and paper options, as well as print-specific features in computer design programs.
- · Online elements of graphic design such as designing for online mediums and converting image sizes for use on websites.

COURSE OUTCOMES:

At the end of the course the student shall be able to

1. Use digital graphics as a tool for presentation.
2. Explore the different tools related to graphic design
3. Explore the typography design.
4. Develop signage boards, logos and website designs.

REFERENCES

1. Karen, Lewis(2009)Graphic Design for Architects: A Manual for Visual Communication,
2. Routledge Publishers, New York
3. Guan, M & Zhou, L(2011) Graphic Design in Architecture, Design Media Publishing Ltd
4. Bringhurst, Robert(1996) The Elements of Typographic Style, Hartley & Marks Inc.,U.S

PRODUCT DESIGN

Course Code	Course Title	TYPE/Evaluation	L	P	D	C	Hrs
B18AR7043	**Product Design**	PE Viva	3	0	0	3	3

COURSE OBJECTIVES

1. To highlight the history, definitions and purpose of product design and explain the role of product designers
2. To illustrate the relationship between Man-machine system and environment and also discuss ergonomics and the influence of human factors on product design.
3. To explain the various aspects of product design, emphasizing on concepts of sustainable design.
4. To illustrate the process of product development through an exercise

COURSE CONTENTS:

UNIT 1

Introduction to Product Design:

Various elements – History of Product Design – Definition of Product Design, understanding of Product Design - Purpose of Product Design – Role of Product Designers.

UNIT 2

Ergonomics:

Definition of human factors, Application of human factors data. Human activities, their nature and effects. Man-machine system and physical environment. Human performance and system reliability. Information input and processing. Human control systems. Applied anthropometry – Human response to climate.

UNIT 3

Aspects of Product Design:

Form, Color, Material, Technology and recyclability, Packaging. Multiple Utility oriented approach to Product Design. Concepts of Green and Sustainable Design.

UNIT 4

Design Thinking Process:

Empathize, Define, and Ideate, Prototype & Test.
Develop skills to conceptualize, create & market the product based on customer needs.

Exercise: Design of Household elements, tools and devices, Design of furniture, Design of Industrial Products. Element design for the physically and mentally disabled people.

COURSE OUTCOMES:

On successful completion of this course, students shall be able to:

1. Develop understanding of history, definitions and purpose of product design andoutline the role of product designers.
2. Interpret relationship between Man-machine system & environment and analyse concepts like applied anthropometry, universal design & user centric design
3. Obtain basic skills required to handle simple product design projects like conceptualization, prototype development, manufacturing and marketing based on customer needs
4. Compare current trends in product development process from detailing, materiality, technicality to imagebility

REFERENCES:

1. The Design of Everyday Things by Don Norman

2. Universal Principles of Design by William Lidwell, Kritina Holden and Jill Butler.

3. Cradle to Cradle: Remaking the way we make things by William McDonough and Michael Braungart.

4. Product Design & Development by Karl T. Ulrich and Steven D. Eppinger.

VERNACULAR ARCHITECTURE

Course Code	Course Title	TYPE	L	P	D	Total	Contact Hrs
B18AR7051	**Vernacular Architecture**	PE Written exam (Tab)	3	0	0	3	3

COURSE OBJECTIVES

1. Brief on various approaches, concepts and provide a world view on the study of Vernacular architecture

2. Describe vernacular architecture across different regions in India as a response to climate, culture and context.

3. Discuss the impact of the Colonial rule on the Vernacular architecture in India through the study of Colonial settlements and towns.

4. Showcase vernacular architecture through Case studies as sustainable architecture that lends itself to new uses as seen in adaptive reuse and eco-tourism in both urban and non-urban context

UNIT I

INTRODUCTION

Definition and classification of Vernacular architecture , Vernacular architecture as a process , methods of survey and study of vernacular architecture, Cultural and contextual responsiveness of vernacular architecture. Global view of Vernacular and its implications.
Research paper readings and discussions to understand vernacular architecture across the world.

UNIT II

Vernacular architecture of the Western and Northern regions of india

Forms spatial planning, cultural aspects, symbolism, color, art, materials of construction and construction technique of the vernacular architecture of the following:

- Bhunga houses in the deserts of Kutch and Havelis of Rajasthan
- Geographical regions of Himachal Pradesh and Kashmir with respect to Kath-Kuni and Dhajji Dewari systems.
- Gujarat: Evolution from Rural to Urban in North Gujarat and South Gujarat, Colonial influence on Havelis of Bohras of Siddhpur

UNIT III

Vernacular Architecture of South India

Forms, spatial planning, cultural aspects, symbolism, art, color, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of the following:

- Kerala: Evolution of the Nalukettu, performance spaces- Koothampalam, Houses of the coastal regions.
- Tamil Nadu: Houses and palaces of the Chettinad region; Agraharams of the temple towns.

Vernacular walk through settlement in urban context to understand planning and response to Climate

UNIT IV

Colonial Influences on Vernacular Architecture of India and future of vernacular

Colonial influences of Dutch, French, Portuguese and British in different regions of India- Evolution of the Bungalow from the traditional Bangla.

Settlement patterns and house typologies in Pondicherry and Cochin and Goa: Influence of Colonial over Vernacular-

Future of Vernacular architecture: The Paradox of conserve or rebuild; introduce adaptive reuse and Eco-tourism as sustainable measures : *Student presentations and discussions on Case studies*

COURSE OUTCOMES:

1. Identify and recognize the term 'Vernacular' and the importance of studying domestic buildings of the past in Indian and World context.
2. Acquire knowledge on the classification of prototypes in different regions and illustrate the finer details using Plans and sections.
3. Relate, compare and associate the planning principles in Vernacular architecture to Climate, Geography, Geology, Socio- cultural factors within different regions in the Indian subcontinent.
4. Associate the terms Adaptive reuse, eco-tourism and sustainability to new age Vernacular architecture in the context of Colonial Heritage towns and settlements.

REFERENCES:

1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press,1997.

2. Amos Rapoport, House, Form & Culture, Prentice Hall Inc. 1969.

3. R W Brunskill: Illustrated Handbook on Vernacular Architecture, 1987.

4. V.S. Parmar, Haveli – Wooden Houses and Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.

5.Kulbushanshan Jain and Minakshi Jain – Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad 1992.

6. G.H.R. Tillotsum – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.

7. Carmen Kagal, VISTARA – The Architecture of India, Pub: The Festival of India, 1986.

8. S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000

9. Willi Weber and Simos Yannas, Lessons in Vernacular Architecture, Routledge 2014

BARRIER FREE ARCHITECTURE

Course Code	Course Title	TYPE/Evaluation	L	P	D	C	Hrs
B18AR7052	**Barrier Free Architecture**	PE Written exam (Tab)	3	0	0	3	3

COURSE OBJECTIVES:

1. To outline the various concepts of barrier free design and types of disabilities
2, To introduce the minimum access provisions required for barrier free environment in various types of building and design elements
3. To acquaint with the types of signage's and design requirement for barrier free architecture
4. To provide an overview on the National and International disability acts and policies through case studies

UNIT–I: INTRODUCTION

Definition of Barrier free built environment, defining the basic concepts of barrier free design, need for barrier free concepts in architecture, concepts of universal design. Definition of Disability. Type of disabilities, Study of dimensions that can be used for guidance when designing facilities and equipment to be used by persons with disabilities, like Reach Ranges, Circulation Dimensions-Wheelchair Dimensions, Walkway Width for Crutch Users, Vision Cone, Heights of People, and Lighting.

UNIT-II: STUDY OF BARRIER FREE DESIGN ELEMENTS

Minimum access provisions required in various types of buildings: Space Allowances – Minimum access provisions, general allowances. To study the anthropometrics and dimensions of mobility devices, special fixtures for barrier free design. Barrier free construction materials and dimensions for flooring, walls, doors, windows, staircases, elevators, toilets, entrances and corridors. Design elements outside the building like curb ramps, pedestrian crossing, public toilets, and parking, signages, flooring and street furniture. Case examples of Barrier free architecture in India and across the globe

Site visit and study of Barrier free design implemented in the immediate environment of the City neighbourhood.

UNIT-III: SIGNAGE

Types of Signage, signage requirements, Signage Specifications - Character Proportion, Character Height, Raised / Braille Characters and Pictogram, Finish and Contrast, Mounting Location and Height, Symbols of Accessibility, Illumination Levels. Signage Design- Language, Sign Typeface, Suggested Sizes for Letters and Symbols, Text Design, Colour and Contrast. Sign Installation - Illumination, Sign positioning.

Learning to be supplemented through design exercises on the same

UNIT-IV: DISABILITY ACTS AND NATIONAL POLICIES

Introduction to Provisions of persons with Disabilities (Equal opportunities, Protection of Rights and Full Participation) Act, 1995, National Policy for provisions for elderly persons, Concept of equal opportunity, human rights, social justice and empowerment of physically challenged persons. Introduction to similar efforts in other countries. Initiatives at global and International level for protection of rights of disabled and the elderly. American disabilities Act 1990 Information on various types of national Institutes, agencies and professional bodies involved in disabled welfare, associated norms and standards thereof. The role of NGO's, professional and outreach.

Learning to be enhanced through discussions and expert lectures

COURSE OUTCOMES:

At the end of the course the student shall be able to

1. Acquire knowledge on the various concepts of barrier free design and types of disabilities
2. To apply the minimum access provisions required for barrier free environment in various types of building and design elements
3. To illustrate design requirements for signages in barrier free environment
4. To interpret the bye-laws and regulations pertaining to barrier free environment

REFERENCES:

1. Ministry of Urban Affairs and Employment. Central Public Works Department, India, "Handbook on Barrier Free and Accessibility", 2014.

2. Ministry of Urban Affairs and Employment. Central Public Works Department, India, "Guidelines and Space Standards for Barrier Free Environment for Disabled and Elderly Person, 1998.

3. Unnati. Team "Design Manual for a Barrier – Free Built Environment", Handicap International, December, 2004.

4. ADA Accessibility Guidelines for Buildings and Facilities (ADAAG) US: American Disabilities Act.

5. The National Building Code of India, 2005.

6. Micheal J. Bednar. "Barrier Free Environments", Dowden, Hutchinson and Ross, Ive 1977.

Course title: Introduction to Sustainability
Course code: B18AR7061
Course description:
This course introduces the academic approach of Sustainability and explores how today's human societies can endure in the face of global change, ecosystem degradation and resource limitations. The course focuses on key knowledge areas of sustainability theory and practice, including population, ecosystems, global change, energy, agriculture, water, environmental economics and policy, ethics, and cultural history.

This subject is of vital importance, seeking as it does to uncover the principles of the long-term welfare of all the peoples of the planet. As sustainability is a cross-disciplinary field of study, this foundation requires intellectual breadth: as I describe it in the class text, understanding our motivations requires the humanities, measuring the challenges of sustainability requires knowledge of the sciences (both natural and social), and building solutions requires technical insight into systems (such as provided by engineering, planning, and management).

Course content:

Sl.No.	Title	Topics/Contents
1	Orientation and Introduction	a) Introduction to sustainability course b) Sustainability and Population Growth c) Growth Curves d) Malthus
2	Population	e) Population introduction f) Transitions g) Demographic Transition h) Future Populations, Part 1 i) Future Populations, Part 2
3	Ecosystems and Climate Change	a) Ecosystems and Climate Change Introduction b) Tragedy of the Commons c) Tragedy of the Commons: Solutions d) Ecosystems and Extinctions e) Weather vs. Climate f) Climate Changes in the Past g) Modern Climate Change

4	Energy	a) Energy Introduction b) Energy Overview c) Oil d) EROEI e) Coal & Gas f) Nuclear Power g) Renewable Energy h) Energy Conservation
5	Water and agriculture	a) Water and Agriculture Introduction b) Limits to Water c) Water Trends d) Agricultural Consumption e) Agricultural Limits f) Genetically Modified Organisms
6	Environmental Policy	a) Environmental Economics and Policy Introduction b) Negative Externalities c) Environmental Policy d) Environmental Policy Assessment e) Environmental Economics f) Application of Environmental Economics and Policy, Part 1 g) Application of Environmental Economics and Policy, Part 2 h) Application of Environmental Economics and Policy, Part 3 i) Environmental Policy Examples: "Biofuels"
7	Measuring Sustainability	a) Measuring Sustainability Introduction b) Biodiversity and Ecosystems c) Sustainability Metrics, Part 1 d) Sustainability Metrics, Part 2 e) Food Miles f) Measuring Sustainability: The Future, Part 1 g) Measuring Sustainability: The Future, Part 2
8	Conclusion	h) Final Quiz

Objectives: On completion of the course, learners will be able to:

- To acquaint students with multi-disciplinary knowledge and options to choose from various fields.
- To facilitate students in enhancing the latest skills in high demand fields
- To enhance the employability of students with relevant certification on current trending fields.
- To provide students with networking opportunities in terms of collaboration with other individuals
- across nations.

Learning Outcomes: At the completion of the course the students shall be able to

1. Develop knowledge on multi-disciplinary courses selected from across fields
2. Discover latest skills in high demand fields like AI, IOT, cloud engineering, circular economy, sustainability, UI/UX, design thinking etc.

3. Acheive high employability with relavant certification from online courses with access to expertise from world class universities
4. Develop networking skills through collaboration with peers accross nations, show cultural sensitivity and be able to adapt to any environment easily.

Course title: Municipal Solid Waste Management in Developing Countries

Course code: B18AR7062

Course description:
This course provides you with an overview of the municipal solid waste management situation in low- and middle-income countries. It covers key elements of the waste management system, such as its technical, environmental, social, financial and institutional aspects. Besides understanding the challenges, you will be introduced to appropriate and already applied solutions through selected case studies.

Course content:

Sl. No.	Title	Topics/Contents
1	Physical Elements of Solid Waste Management	j) Overview of the course k) Why is this course important? l) Municipal waste generation and characterization m) Waste collection & transport n) Improving efficiency of waste collection and transport o) Recycling municipal waste p) Waste disposal / Landfills – part 1 q) Waste disposal / Landfills - part 2 r) Upgrading a Dump Site s) Key messages Week 1 t) BONUS: Planning a Waste Generation and Characterization Study - part I u) BONUS: Conducting a Waste Generation and Characterization Study - part II
2	Governance Aspects of Solid Waste Management	v) Policies and legislation w) The role of the public sector x) The role of the private sector y) Integrating the informal sector z) The Role of Community Members aa) Public Awareness Campaigns - Case study India bb) Financing Mechanisms - part 1 cc) Financing mechanisms - part 2 dd) Key messages Week 2 ee) BONUS: Triggering Community Participation with the RANAS approach ff) BONUS: Financial comparison of collection and transport systems

3	Organic waste treatment	h) Overview of Biowaste Treatment Technologies i) Science of composting j) Composting technologies k) Operating the Composting Process l) Case Study Composting - Dhaka, Bangladesh m) Case Study Composting - Temesi, Bali, Indonesia n) The Basics of Anaerobic Digestion of Biowaste o) Anaerobic Digestion Technologies and Operation p) Using the Products of Anaerobic Digestion q) Vermicomposting of Biowaste r) Biowaste Processing with Black Soldier Fly Larvae s) Thermochemical Conversion of Biomass t) Key messages Week 3 u) BONUS: Determining moisture content of biowaste mixtures v) BONUS: Determining C:N ratio of biowaste mixtures w) BONUS: Calculating the size of an anaerobic reactor x) BONUS: Constructing an Anaerobic Fixed Dome Digester y) BONUS: Operating a Black Soldier Fly waste treatment facility
4	Special waste fractions	i) Overview of special waste fractions j) Mixed waste treatment k) Hazardous Waste Management l) Health Care Waste Management m) E-waste n) Plastic Waste Management - Theory o) Plastic Waste Management - Examples p) Construction and Demolition Waste q) Key Messages Week 4 r) BONUS: Rapid assessment of waste-to-energy projects
5	Strategic Issues and Planning in Solid Waste Management	g) Integrating biowaste management through strategic planning h) Strategic Municipal Solid Waste Management Plan i) Comparing cities' performance j) Waste and climate change k) Solid Waste & Sustainable Development Goals l) Introduction to the Waste Flow Diagram m) Applying the Waste Flow Diagram n) Circular economy and solid waste management o) Selecting an Organic Waste Treatment Technology (SOWATT) p) Key messages Week 5

Objectives: On completion of the course, learners will be able to:

- To acquaint students with multi-disciplinary knowledge and options to choose from various fields.
- To facilitate students in enhancing the latest skills in high demand fields
- To enhance the employability of students with relevant certification on current trending fields.
- To provide students with networking opportunities in terms of collaboration with other individuals across nations.

Learning Outcomes: At the completion of the course the students shall be able to

1. Develop knowledge on multi-disciplinary courses selected from across fields
2. Discover latest skills in high demand fields like AI, IOT, cloud engineering, circular economy, sustainability, UI/UX, design thinking etc.
3. Acheive high employability with relavant certification from online courses with access to expertise from world class universities
4. Develop networking skills through collaboration with peers accross nations, show cultural sensitivity and be able to adapt to any environment easily

SELF DIRECT LEARNING

Course Code	Course Title	Type	L	P	D	Total	Contact Hrs
B18AR7070	**SELF DIRECT LEARNING**	PA	2	0	0	2	2

Self directed learning is a unique flagship learning program offered to the B.Arch students of School of Architecture,
REVA University, Bangalore during their 7th semester. Students are given the option of directing their learning paths in order to gain 2 credits. A wide range of options ranging from knowledge enhancement through online courses to self learning through research paper writing, product patents filing, consultancy and publications are available for the students to take up as a part of this course.

Stream 1: Self Learning through Online taught courses

COURSES SUITABLE FOR SDL (2 credits) Discipline- architecture, built environment			
1	**Culturally responsive built environments**	**NPTEL (23 Aug 2021)**	**8 weeks**
2	**Contemporary architecture and design**	**NPTEL (23 Aug 2021)**	**8 weeks**

Stream 2: Self learning through advanced option tasks

Advanced research based projects are assigned to eligible students. Faculty guides are allocated to ascertain the progress.

VIII Semester

Architectural Design – VII

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR8010	Architectural Design -VII	PC Viva	2	1	7	13	10

COURSE OBJECTIVES:

1. To identify and categorize the different informal parameters relevant to the process of designing an urban environment.
2. To analyse the process of preparing an urban planning proposal
3. To synthesize the outputs from the above to suggest visual, tactile and measurableimprovements in the places that make up our urban living environment
4. To undertake the exercise of the design of the un-built landscape environment, as part of 3) above.

COURSE CONTENTS

UNIT 1

Discussion on Design brief, Site visit and Survey, Case Studies

The studio shall begin with an introduction to a) the design brief, and b) the proposed site. This will be followed up by case studies documenting implemented urban designs so as to understand the design process. The documentation shall be an intensive exercise with teams of two or more who would a) Identify the project (across Bangalore or Karnataka or India) and b) Analyse the entire design process against all the assigned parameters.

UNIT 2

Site Analysis

This would consist of a detailed site analysis including a) SWOT analysis b) City scape analytical models showing density, built vs. open, skyline, road network, transit-oriented development, service lines, land use and height of the buildings showing various systems integrated in functioning of an urban built environment. Get an overview of the existing urban fabric and understand the issues.

UNIT 3

Conceptual Design

The studio will focus on learning the process of evolving urban design guidelines and generation of a concept based on the inferences obtained from the case studies and the site analysis. Exercises in conceptual modeling shall be conducted using suitable software.

UNIT 4

Detailed Design

The conceptual design process will be taken forward to a detailed design level in this unit. The students would learn to refine the conceptual design thought process and come up with the final design solution, synthesizing all the inputs and criticism received during the conceptual design process. They will carry out detailed design modelling and simulation.

COURSE OUTCOMES:

On completion of the course the students will be able to:

1. Acquire an understanding of the urban design process, including all the parameters and the roles played by the different interest groups in the realization of an urban design scheme
2. Develop the skill of handling Design projects of an urban scale as different from the detailing of the individual architectural building projects.
3. Demonstrate the ability to be able to visualize at the urban scale and think in terms of volumes

REFERENCES:

1. Neufert, Ernst architect's data. Crosby Lock Wood and Sons
2. Time Saver Standards for Architectural Design Data. McGraw Hill.
3. Essentials of Urban Design By Mark Sheppard
4. Sustainable Urbanism: Urban Design With Nature By Douglas Farr
5. Paul Sprelregen Urban Design: The architecture of Towns and cities
6. Bacon N. Edmund. Design of cities. Penguin Books, New York 1976.
7. Krier Rob, Urban Space 3rd Ed, Academy Editions, London 1984.

Pre thesis

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR8020	Pre thesis	PC Int	0	4	0	2	4

Course objectives:

1. To facilitate topic selection on the basis of the project synopsis presented to the panel by a process of iteration and elimination
2. To facilitate the student in definition of aim, objectives, scope, limitations and methodology of the project
3. To guide the student to research into the selected project through literature review of quality research papers, journals and books
4. To enable students to select suitable case studies that will bring clarity in defining spatial requirements, Site selection and special requirements pertaining to the topic.

Course Outcomes: On successful completion of the course, the student shall be able to

1. Use Fundamental knowledge of history, technology, regulations, culture, climate and context to identify a project for detailed study

2. Formulate the synopsis by applying analytical reasoning and critical thinking
3. Apply skills of research and critical evaluation in drawing inferences from the literature and case studies to substantiate the chosen project and present the same through reports and drawings
4. Evaluate the project need, feasibility and identify a suitable Site for designing the same in the given context

COURSE CONTENT:

Pre-Thesis course will give opportunity to students to start preparation for the Architectural design thesis project. Student is expected to develop a design of his or her own choice and to demonstrate the ability to use effectively the tools of independent investigations and judgment to evolve design criteria. The application of these may be original design or research-oriented work.

UNIT I- Identification of a domain of interest and select a few topics of suitable scale. Develop a synopsis for each of the chosen topics. Using critical evaluation and process of elimination, develop any one idea to detail

UNIT II- Apply analytical reason and critical thinking to formulate the aims, objectives, scope, limitations and possible methodology for the project chosen.

UNIT III- Domain research, identification and prioritization of parameters for thesis, literature survey for identified parameters, secondary case studies

UNIT IV- Identification of Site, justification and need for the project, identification of primary case studies, prepare the guidelines and checklist for case studies and detailed site studies

B18AR8030	LANDSCAPE DESIGN	L	P	D	C
Duration:14 Wks		2	2	0	3

Course Objectives:

1. To introduce evolution of landscape architecture through different era across the world

2. To elaborate the Botanical varieties and their characteristics for Landscape design

3. To familiarize the students with various elements of landscape architecture

4. To introduce the Landscape development process using the elements of landscape

Course Outcomes:

On successful completion of the course students shall be able to

1. Comprehend the origin and concept of landscape architecture and understand the significance of

2. Influencing trends and methodology practiced during various period of time in the evolution of landscape architecture.

3. Identify the botanical characteristics of landscape elements and wisely choose the right plants and trees as per the Landscape design requirement.

4. Categorize various man-made elements of landscape and the importance of each elements for landscape design

5. Comprehend the significance of Landscape architecture and incorporate it along with architecture (building) from the beginning through site planning.

Course Contents:

UNIT I: LANDSCAPE DESIGN AND BUILT ENVIRONMENT

Role of Landscape design in built environment. Terminology: Land, Landscape, Landscape Architecture, Landscape Architect. Evolution of concepts in landscape design in integrating builtspaces to open spaces. Historical Background: Oriental (Asia) and occidental (countries of west).Evolution of architecture in modern era: Case study of some influential contemporary landscapearchitecture and their salient features: Duisburg – Nord Park (Landschaftspark) Duisburg, Germany, Fresh kills landfill – New York, Highline Park – New York and Borneo Sporenburg- Amsterdam, The Netherlands

UNIT II: LANDSCAPE ELEMENTS: NATURAL

Landforms, water and vegetation. Selection and management of plant material in relation to builtenvironment, taxonomy and classification of plants. Study and analysis of existing landscaped areas Introduction to study of plant materials in relation to landscape architecture and design.
Appearance, functional and visual effects of plants in landscape design. Selection and management of plant material in relation to built environment, taxonomy and classification ofplants, trees, shrubs.

UNIT III: LANDSCAPE ELEMENTS: MAN-MADE

Landscape structure, Landscape shelters, Steps / Walls / Fences /Screens / Trellis, Landscape features or accessories, Pathways and paved area and Outdoor / street furniture. Natural and Manmade landscape in urban and rural landscape. Contemporary attitude to development and design of open spaces like urban spaces, courtyards, gardens, parks, Streetscape, street furniture,pavements and other architectural elements in relation to Landscape design

UNIT IV: SITE PLANNING

Site planning with reference to distinct characteristics like topography, vegetation, hydrology, access, surroundings etc. Principles of landscape design and built environment. Philosophical and design issues related to site development-spatial and contextual relationships of built and outdoorspace and circulation, site and its relationship to surroundings, importance of climate and social factors in development of site

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR8041	Urban Design	PE Written	3	0	0	3	3

Course objectives:

1. To impart the knowledge about various developments in the field of urban Design.
2. To describe the elements of Urban design and how Cities are structured

3. To give an overview of urban design as an interface between the fields of architecture and urban planning
4. To describe changing trends due to urbanization and suburbanization of cities.

Course contents

UNIT 1

Introduction to Urban design - Discussion on Architecture, Urban Design, and nature of urban design projects in public and private developments. Urban design guidelines followed during various periods. Introduction to the terms legibility, permeability and urban morphology.

UNIT 2

Structure of cities- sectors, blocks, streets, squares, buildings and open spaces. Elements of Urban Spaces: squares and streets. Role of planning agencies such as development authorities, Urban Arts Commission in the development of cities. Influence of city development policies namely Master plans, zoning regulations on urban Design.

UNIT 3

Urban Design process - Field Study, Identification of area for study.

UNIT 4

Design Proposals, Developments, and urban design guidelines

COURSE OUTCOMES: On completion of the course, students shall be able to:

1. Define the term Urban Design and identify the elements of urban design
2. Interpret the structure of a city through elements of urban design and realize the importance of Agencies and authorities.
3. Demonstrate an ability to comprehend the nature of urban design and related problems and identify Solutions through field study.
4. Analyze urban form, size, qualitative and quantitative techniques of assessing requirements and planning amenities and apply the learnings in Design proposals.

References:

1. Bacon N. Edmund. Design of cities. Penguin Books, New York 1976.
2. Krier Rob, Urban Space 3rdEd, Academy Editions, London 1984.
3. Mumford Lewis City in History, Its origin transformation and its prospects.
4. Paul Sprelregen Urban Design: The architecture of Towns and cities
5. Morris, Anthony, J.E. History of Urban Form.
6. Kostof, Spiro, City Shaped: Urban Patterns and Meanings through History.

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR8042	**Conservation Studies**	**PE Written**	**3**	**0**	**0**	**3**	**3**

Course objectives:

1. To introduce the definition, principles, ethics and value of heritage conservation.
2. To explain how to conduct the assessment of a heritage building including the different methods of survey and the types of damages that can affect a heritage building.
3. To demonstrate different preservation techniques in architectural conservation
4. To discuss and assess various national and international case study examples of

5. architectural conservation

Course Outcomes: On successful completion of the course, the student shall be able to

1. Explore various concepts and prevailing practices in conservation and also explore the role of various national and international organizations working towards the conservation of heritage structures.
2. Provide condition assessment of a heritage building through non-destructive survey methods.

3. Suggest the levels of intervention and also provide solutions for repair and replacement of components.
4. Explore successful case studies to understand the diverse conservation strategies utilized for heritage management

Course Contents:

UNIT –I

Introduction: Definition, types, need; principles, ethics & value; tangible & intangible components, Degree of Intervention; Evaluation & assessment; Documentation; Procedures & techniques; Concepts & prevailing practices in conservation, restoration, retrofitting, rehabilitation, consolidation, protection, adaptive reuse. Architectural Conservation: Preservation & conservation philosophies; Pioneers & societies in field of conservation; International Charters; International approaches from UNESCO, ICCROM, GETTY foundation, etc.; National approaches: A.S.I., State Archeology, INTACH, Urban Art Commission, Heritage Commissions, local bodies, etc.; Techno legal provisions, codes & byelaws for interventions.

UNIT II

Assessment of Building Condition: Understanding of original building conditions; Documentation of current conditions- non-destructive survey methods, environmental monitoring, simple & sophisticated analytical methods; Types & causes of damages; Damage to building components & structural systems - superstructure & substructure; Location & degree of damages - defect monitoring methods, their impact - diagnosis of failure & damages.

UNIT III

Preservation Techniques In Architectural Conservation: Analysis of problem; Types, Degrees & Limitations for intervention; Levels of intervention- Structure, building complex, precinct & heritage zone; Provision of solutions for repair & replacement of components; Restoration (in case of living monuments), preservation, reconstruction & maintenance. Sequence & phasing; Materials & methods; Detailing & finishing.

UNIT IV

Case Studies in Architectural Conservation: Examples of iconic conservation projects; Heritage zones; Conservation strategies- documentation, analysis, techniques, interventions & outcomes; Models of preservation, reconstruction & adaptive reuse. Influences & benefits - Physical, contextual, political, social, cultural, economic, ecological, tourism, technological, material, spatial & visual.

REFERENCES:

1. Glendinning Miles , The Conservation Movement: a History of Architectural Preservation(ROUTLEDGE 2013) , 978-0-415-54322-4
2. Agnoletti, Mauro, ed ,Conservation of Cultural Landscapes, 2006
3. Oliver, Paul, Built to meet Needs: Cultural Issues in Vernacular Architecture, 2006
4. Beckmann, Poul ,Structural Aspects of Building Conservation ISBN 1417544341
5. E.F.N. Ribeiro ,The Law and the Conservation of Man-made Heritage in India,1989
6. New Delhi: INTACH
7. Tripathi, Alok, Ancient monuments and Archaeological Sites and Remains Act, 1958: with Rules Amendments, Notifications and Orders, 2007
8. McGlade, James, ed. and Leeuw, Sander Van Der, ed. , Time, Process and Structured Transformation in Archaeology, 2010

Advanced Building Materials

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR8051	**Advanced Building Materials**	**PE Written**	**3**	**0**	**0**	**3**	**3**

COURSE OBJECTIVES:

1. To identify the range of upcoming building materials and technologies

2.To impart knowledge of their composition along with their primary physical and chemical properties

3.To provide exposure to the students to the primary & secondary applications of these materials, along with their advantages and disadvantages including their sustainable characteristics

COURSE OUTCOMES:

On completion of the course the students will be able to:

4. Acquaint themselves with some of the latest building materials and technologies, along with their characteristics and main composition
5. Acquire the knowledge of their different areas of application along with the justification for the same
6. Develop an insight into the sustainable characteristics of these materials and technologies

COURSE CONTENTS

UNIT 1

Introduction to the upcoming building materials and technologies

The studio shall begin with an introduction to the upcoming building materials and technologies along with an explanation of the need for having these materials and technologies. This would be followed by a discussion on their physical and chemical composition and an analysis of their major physical and chemical properties. The materials and technologies can include the following, though not limited to these:

i. EPS Core Panel System
ii. Lost-in-place formwork system- Plaswall Panel system
iii. Advanced Building System – Emmedue
iv. Light Gauge Steel Framed Structure (LGSF).
v. Bamboo Matt Corrugated sheets
vi. Bamboo wood
vii. Glass Fibre Reinforced Gypsum Panel System
viii. Waffle-Crete
ix. Corian

UNIT 2
Advantages & Disadvantages

This would consist of a detailed discussion on the important advantages and disadvantages of each of these building materials and technologies. Considering the present scenario, special emphasis would be laid on the sustainable qualities of each of the materials and technologies and their impact on the environment, including their carbon footprints.

UNIT 3

Practical Applications

This unit will mainly focus on the practical applications of these materials and technologies, including the functional and aesthetic justifications and implications of the same, so as to enable the students to be able to make a judicious selection of a particular material/ technology on a case to case basis, and become aware of the short term as well as long term implications of their use.

UNIT 4
Detailing

This unit would consist of developing an understanding of the various types of detailing that can be developed using these materials and technologies. It would include a study of the conventional detailing and methods of improving the same. It would also include the development of the detailing in conjunction with other materials and understanding the short term and long-term impacts.

REFERENCES:

- Compendium of building materials and technologies, BMTPC
- User manuals for EPS, Plaswall Panel system, Emmedue, Light Gauge Steel Framed Structure, Glass Fibre Reinforced Gypsum Panel System, Waffle-Crete
- IPIRTI publications on Bamboo Matt Corrugated sheets and Bamboo wood
- User manual for Corian

COURSE OBJECTIVES:

4. To identify the range of upcoming building materials and technologies
5. To impart knowledge of their composition along with their primary physical and chemical properties
6. To provide exposure to the students to the primary & secondary applications of these materials, along with their advantages and disadvantages including their sustainable characteristics

COURSE OUTCOMES:

On completion of the course the students will be able to:

7. Acquaint themselves with some of the latest building materials and technologies, along with their characteristics and main composition
8. Acquire the knowledge of their different areas of application along with the justification for the same
9. Develop an insight into the sustainable characteristics of these materials and technologies

COURSE CONTENTS

UNIT 1

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xii. Advanced Building System – Emmedue
xiii. Light Gauge Steel Framed Structure (LGSF).
xiv. Bamboo Matt Corrugated sheets
xv. Bamboo wood

xvi. Glass Fibre Reinforced Gypsum Panel System
xvii. Waffle-Crete
xviii. Corian

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Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR8052	**Real Estate & Valuation**	**PE Written**	**3**	**0**	**0**	**3**	**3**

Course Objectives:

1. Explain concepts of managing retail real estate and corporate real estate effectively.
2. To understand land as a resource.
3. To appreciate the role of team work to make a successful project
4. To provide adequate inputs so as to make to the whole development as a smooth activity and ultimately be aware of the tactical aspects of marketing the completed property.

Course Outcomes:

1. Identify concepts of Real Estate management and describe the Real Estate Market
2. Illustrate the wide range of issues that reflect the principal areas of specialization in the real estate profession
3. Stimulating an awareness of the issues involved in international real estate
4. Developing analytical and methodological skills that are critical for management, decision-making and problem-solving roles.
5. **Mapping of Course Outcomes with programme Outcomes**

Course Contents:

UNIT- 1 REAL ESTATE DEVELOPMENT -

Fundamental concepts and techniques, recognizing institutional and entrepreneurial elements, issues encountered in various phases of development like site evaluation and land procurement, development team assembly, market study and development scheme, construction & project management, project marketing and hand-over of completed projects.

Project Feasibility, Development Financing, Asset Disposal and Redevelopment Options, Analyses of Development Sites and Case Studies, integrated case study on a specific development project, which requires reviewing, analysing and resolving the problems or strategic issues.

UNIT- 2 URBAN POLICY & REAL ESTATE MARKETS

Impact of Government Regulations and Public Policies on Real Estate Markets, include urban land rent and location theories, land use structures, community and neighborhood dynamics, degeneration and renewal in urban dynamics, private-public participation, government policies on 95 public and private housing, and urban fiscal policy including property taxation, local government finance.

UNIT- 3 CORPORATE REAL ESTATE ASSET MANAGEMENT

Strategic plans to align real estate needs with corporate business plans; Performance measurement techniques to identify asset acquisition or disposal; methods for enhancing value through alternative uses, efficient space utilization or improving user satisfaction.

UNIT- 4 COMMERCIAL REAL ESTATE APPRAISAL

Determination of the capitalization rates across different types of properties; Appraisal of freehold and leasehold interests; Critical analysis of the valuation approaches adopted for securitized real estate; Asset pricing models; investment flexibility and future redevelopment opportunities.

REFERENCES:

1. Barron's real estate hand book V Edition, Hauppauge, NY, Barron , 2001

2. Project planning scheduling & control in construction an encyclopedia of terms &applications , New York, Wiley, 1995

3. Gerald R Cortesi, "Mastering Real estate principles" (2001); Dearborn Trade Publishing, New York, U.S.A.

4. Fillmore W Galaty, "Modern Real estate practice" (2002); Dearborn Trade Publishing, New York, U.S.A.

5. Tanya Davis, "Real estate developer's handbook", (2007), Atlantic pub company, Ocala,USA. Mike .E. Miles, "Real estate development – Principles & Process 3rd edition, (2000);Urban Land Institute, ULI – Washington DC

6. Richard B Peiser& Anne B. Frej, "Professional real estate development" – The ULI guide to the business – (2003), Urban Land Institute U.S.A.

CERTIFICATION COURSES- ADVANCED ARCHITECTURAL MODELLING TOOLS

Course Code	Course Title	YPE/Evaluation	L	P	D	C	Hrs
B18AR8060	Certification Course in Advanced Software	SE Certification INT	0	4	0	2	32

COURSE OBJECTIVES:

1. To give an overview of 3D modelling software as a tool for basic understanding of design representation and techniques
2. To illustrate and develop the techniques for generating creative forms.
3. To create a design that respond to the visualization using advanced software
4. To integrate the outputs by simulation, evaluation and animation using advanced software

1. COURSE CONTENTS:

2. UNIT I: Introduction to modeling Interface

Understanding the drafting interface by learning selection methods, modify command, drawing objects and essential software tools. Fundamentals application of the software to transform 2D to 3D model. Exercise to understand navigation, groups, parameters, printing, the import and export of drawings.

UNIT II: Forms and Modeling

Application of surface modeling: – Introduction to concepts of BIM (Building Information Modeling) and other modeling software's. Exercise to understand 3D modeling techniques and to create generative and dynamic forms, use of mesh tool, surfaces transform through to nurbs, Boolean solid operations and manipulating properties.

3. UNIT III: Simulation and Energy analysis

4. Conceptual energy analysis and evaluating the project by performance, BIM material substitution, object library, project phase and project lifecycle management. Integrate the BIM model with virtual reality as 3D interactive models.

UNIT IV: Rendering and Animation

Classroom exercises to generate a 3d Model using the software's learnt and the application of the different work sets by material mapping, light setting, real-time rendering, walkthrough

videos and 3d printing techniques.

COURSE OUTCOMES:

On completion of the course the student will be able to:

1. Acquire knowledge of advanced drawing techniques, editing object, exploded assemblies to modify.
2. Understand the methods and application to create Surface modeling, Generative and parametric forms to represent their designs skills.
3. Visualize their designs through advanced software tools like BIM analysis evaluation and Simulation.
4. Comprehend in totality the complex nature of 3d printing and photorealistic rendered video presentation of their designs**.**

REFERENCES:

1. http://docs.mcneel.com/rhino/6/usersguide/en-us/index.htm
2. http://bimscape.com/beginners-guide-to-revit-architecture/
3. https://www.sdcpublications.com/pdfsample/978-1-58503-812-1-2.pdf
4. User's Guide
5. https://www.ace-hellas.gr/wp-content/uploads/2014/10/978-1-58503-973-9-7.pdf
6. http://digitaltoolbox.info/grasshopper-basic/interface/

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR8070	**Certification Course on Entrepreneurship**	**PE Written**	**2**	**0**	**0**	**2**	**(12 hours external)**

Course objectives:

1. To familiarize students with basic concepts in the area of entrepreneurship
2. To facilitate development of personal creativity and entrepreneurial initiative
3. To introduce students to the key steps in the elaboration of business idea and understanding the stages of the entrepreneurial process
4. To emphasize to students the need for lifelong self learning using various media

Course Contents:

Students are encouraged to take up online learning courses offered through various platforms such as SWAYAM, NPTEL, MOOC, Coursera, EDX etc in the field of entrepreneurship development.

As architecture professionals students must acquire the necessary skills and knowledge to be able to independently run an entrepreneurial venture. The certification course must introduce the students to the basics of entrepreneurship and provide an experience in self learning concepts through online medium.
A list of recommended courses will be shared with the students at the start of the semester.

Course Outcomes:

1. Identify the elements of success of entrepreneurial ventures,
2. Evaluate the effectiveness of different entrepreneurial strategies,
3. Specify the basic performance indicators of entrepreneurial activity,
4. Engage in life long learning through online and other media

IX SEMESTER

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18AR9010	**Practical Training**	**PA Viva**	**16 working weeks**			**26**	**16 working weeks**

OBJECTIVES

1. To equip students with knowledge of fundamental concepts in architecture & construction process
2. To equip students with practical exposure on architectural design process to formulate and solve real life problems
3. To equip students with skills in verbal, written and graphical communication of architectural design to convince clients.
4. To expose students to management of projects and dealing with various stakeholders through team work

Course Content:

Practical training under an Architect registered with Council of architecture envisages the following:

The students of architecture are to undertake a practical training for a period of two semesters under a registered Architect or in the architectural wing/department of an organization with senior Architects in its roll. The organization may be governmental, Private or non- governmental voluntary organizations namely CPWD State PWD Department or Board for Urban Planning, and NGO's involved in Housing, Urban development planning, or Environmental Planning under a senior Architect. Training may also be in allied areas namely interior design, Landscape Architecture, Visual design, etc. where a senior architect offers support and training.

- The School shall scrutinize the Credentials of the training organization before permitting any student to take up the internship / practica1 training under that organization.

- All Training organizations are requested to furnish the attendance and progress report every month to the School. A minimum of 80% of attendance at the Office for a period of

20 Calendar weeks is required for the students to qualify to register for the next semester.

- After internship and practical training students are to submit the details of work or project in which they have involved. Report shall be submitted in written forms to the School along with a certificate from the employment along with copies of Drawings prepared.
- The School at the end of the semester shall conduct the evaluation of the student's performance and achievement in the form of Viva Voce.

Distribution of Credits shall be as follows: Method of evaluation VIVA in presence of external Jury:

Rubrics will be shared with the students at the start of the semester

S.no	Description	Duration/No of visits	No of credits
1	Training report- to include daily log and weekly reports signed by Office authority	16 working weeks	20
2	Site learnings and material study report with sketchbook	No of visits	02
3	Hard copy of drawings produced at work	No of drawings	02
4	Materials study/ Office management		02

Course Outcomes:

1. Demonstrate an understanding of fundamental concepts in architecture & construction
2. Gain practical exposure on architectural design process to formulate and solve real life problems
3. Acquire advanced skills in verbal, written and graphical communication of architectural design to deliver to clients, contractors.
4. Gain experience in managing projects, dealing with various stakeholders and team work

X Semester

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18ARX010	**Thesis**	**PC Viva Vce**	**6**	**0**	**8**	**18**	**14**

Course Objectives:

1. Demonstrate special capabilities in the chosen topic
2. Assimilate the knowledge, both theoretical and practical, that the student has gained during the course of his study
3. Enhance the student's abilty to derive design solution in both local and global context
4. Provide an opportunity for the student to achieve a culmination of his development in respect of the knowledge, attitudes and skills gained over the entire course of study

The Architectural Thesis is the culmination of the development of the student's knowledge, attitudes and skills over the course of studies in architecture. It is an occasion for exercising conscious choices in the field based on the students' personal abilities and inclinations, and for testing out his commitment. The student, in consultation with the faculty, is expected to demonstrate through an imaginative approach, his expertise in effecting positive changes in our built environment.

Contents:

1. The Thesis shall deal with large built environment project. Work shall be conducted and presented by the individual student in the form of technical report and design drawings. Work shall be comprehensive in nature involving primary data collection, feasibility studies and architectural programming. Large buildings, urban design projects may be taken for the final project/thesis in consultation with faculty.
2. Students are encouraged to pick up live projects.
3. The thesis shall include an area of special interest of relevance, and shall detail its application and design solution. Eg. Interior designs, Services, Socio-economic studies, Structural design, Computer software or images etc.
4. The process for Thesis Project will include – Description, Case Study, Site Study- Analysis & Inferences, Development of specific Design Guidelines; Design Program & Area Requirements, Conceptual Development, Design Development, Final Design, Presentation.

Rules and Regulations – Thesis Submission

- Each individual student in consultation with the guide appointed shall prepare initial synopsis and project plan. The project shall be submitted to the School and the thesis committee appointed by the
- School views the viability of the project. The approved topic shall be taken up by the student for the thesis work.
- Role of the guide is not only to provide academic support and facilitate but also to monitor progress of the work. The guide shall maintain the attendance of his / her student.
- The media of presentation may be unconventional drawing sheets or in digital format with appropriate signature of the school.
- A jury appointed by the School shall evaluate.
- The student has to complete the stage requirements including attending and presenting all the interim reviews in sequence with endorsement of the guide and such will only be allowed to present for the final evaluation by the School appointed jury.

Unit 1

Literature study, case study presentation through drawings and presentations. Site location finalization. The media could be digital or handmade drawings.

Unit 2:

Concept drawings

Unit 3
Design development, arriving at detail built form, site plan

Unit 4: Preparation of report of the project, Final drawings with detailed plans, elevation, sections, 3d views,

Details of any special aspects like sustainability, acoustics, structural integrity, landscaping many more

Associated with architecture.

Course Outcomes:

1. Acquire a deeper insight into the chosen topic of interest through research and critical thinking.
2. Apply the fundamental knowledge of history, culture, technical and professional expertise gained to address environmental and social needs through the chosen topic.
3. Demonstrate creative abilities to deliver design solutions in both local and global context
4. Interpret the design and learnings by demonstrating effective visual, written and verbal communicative skills through the final output of drawings, models & presentations

Course Code	Course Title	Type/Evaluation	L	P	D	C	Hrs
B18ARX021	**Architectural Journalism**	**PE Witten**	**3**	**0**	**0**	**3**	**2**

Course Objectives:

1.To introduce to the basic structure and principles of architectural journalism
2.To explain the techniques and procedure for conducting architect and client interviews as well as video coverage
3.To illustrate the writing techniques required for architectural journalism and also explain the ethics, laws and legislation
4.To explain the techniques and legal aspects related to editing and publishing

Course Contents:

UNIT I
Overview – Definition, Significance, scope, purpose, structure, principles, techniques, processes, mediums, study of potential readers, contemporary architectural journalism.

UNIT II
Environment ,Social Change, Persuasion- Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking. Theories of journalism, Introduction to architectural software's needed in journalism and photography, Video coverage, walkthrough of buildings, production of contemporary architectural journalism. Understanding the individual demands in the context of newspapers, radio, film, and television.

UNIT III

Writing techniques – Styles, format, purpose, medium, frequency, clear structure, coherent & distinctive look, visual appearance, graphic design, genres, image, descriptive & analytical reports.

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